Educational Communications and Technology:
Issues and Innovations

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Toward Inclusive Learning Design

Social Justice, Equity, and Community

AECT ASSOCIATION FOR EDUCATIONAL COMMUNICATIONS & TECHNOLOGY

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Preface

For the second straight year, the AECT Summer Research Symposium was held virtually. Over 40 authors presented and discussed their work, and they were joined by keynote speakers Camille Dickson-Deane and Terresa Moses. Deepak Subramony, originally invited as a keynote, was unable to attend, but has also contributed to this volume.

The Symposium has a different general topic each year, one that is both targeted toward relevant concerns and opportunities of the present and sufficiently broad to attract writers from diverse fields and perspectives. At the same time, much of the work presented in the edited volumes of the Symposium reflect the interests of the larger AECT International Convention, which primarily deals with the use of technology in education. Broadly written, this year's symposium sought to encourage discourse and the exchange of ideas within current societal trends, and with a particular focus on educational technology.

Topics are selected to have currency and to be engaging for a broad range of authors, whether in educational technology, instructional/learning design, or elsewhere. This year's topic was *Toward Inclusive Learning Design: Social Justice, Equity, and Community*, a focus spurred by the killing of George Floyd and subsequent calls for justice and change. As with previous symposia, writings reflect broad-ranging discussions and ideas. However, unlike previous symposia, the number of book chapters that are included in this year's edited volume is unprecedented – the largest number of chapters we have received to-date, and perhaps indicative of our topic's importance. Writings explored a range of topics germane to themes of social justice, culture, critical race theory, diversity equity, inclusion, etc. We describe in detail the topical themes included in this edited volume in the following section.

The Symposium offers the opportunity for practitioners in education and instructional design to put forward ideas and to discuss them with their peers. It brings to the open new experimental concepts as well as focused arguments, quantitative proofs, and qualitative discoveries. Discussion is dispersed and intimate, with multiple opportunities for engagement. We pride ourselves on our unique and peculiar process, which we believe could serve as a lighthouse for others in the field who

seek to pursue avenues for scholarship that may diverge from established tradition. In this spirit, we present to you the contents of this edited volume.

Inside the Edited Volume

To explore the breadth and depth of scholarship represented in the included book chapters, the editors performed a qualitative content analysis based on the keywords that the chapter authors provided. Our analysis procedure began by extracting all keywords and inputting them into an online graphic organizer, Miro (https://miro.com/), a digital tool that allows for collaborative whiteboarding and organization of sticky notes in a manner that is similar to face-to-face card sorting and affinity mapping procedures. Following this, editors collaboratively sorted keywords into groups and labeled the groups with provisional titles. Using an axial coding process, the editors jointly classified, categorized, and refined the coding structure across multiple rounds of coding (Fig. 1).

Two overarching thematic areas emerged: keywords that were directly germane to the theme of the edited volume (*Toward Inclusive Learning Design: Social*

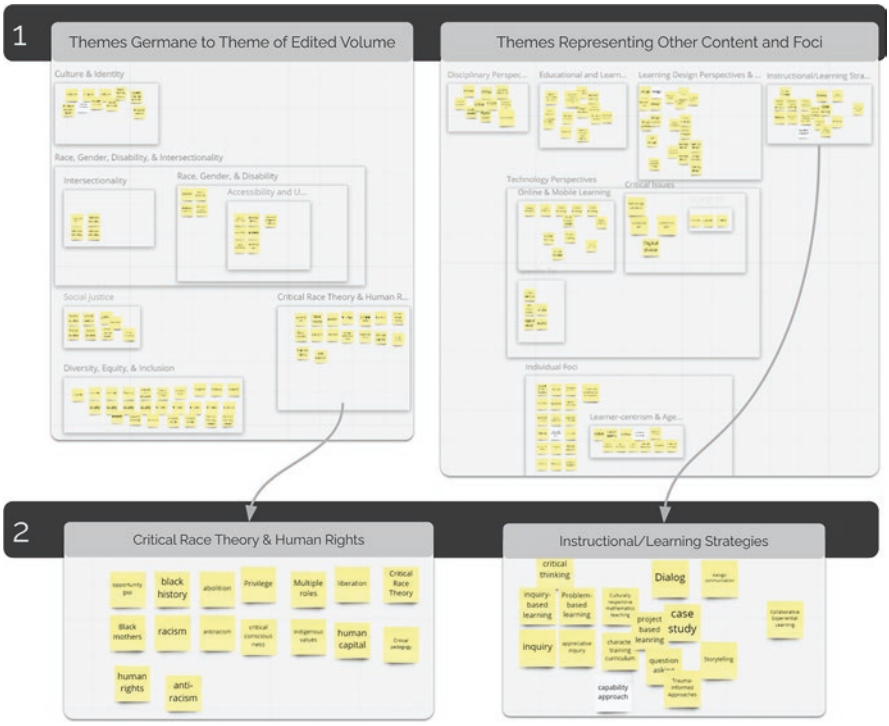

Fig. 1 Graphic organizer illustrating (1) overarching thematic areas and associated thematic focus areas and (2) exploded views of two thematic focus areas

Justice, Equity, and Community), and those that were representative of the other content and foci of the individual chapters (e.g., technology perspectives, educational and learning contexts, disciplinary perspectives). Within these overarching categories, a range of thematic foci emerged (Table 1).

After having categorized keywords according to thematic focus, the editors entered all keywords and thematic foci into a spreadsheet for further analysis. Specifically, the editors first compared the keywords provided by chapter authors with the thematic foci that emerged during qualitative coding. Then, using each chapter's keywords, the editors categorized the book chapters using associated thematic foci. Most chapters' keywords represented more than one thematic focus. Therefore, we created an index of all thematic foci in Table 2 and list out book chapters that included associated themes. Readers are encouraged to use this table to find chapters quickly that address the five thematic foci of this edited volume.

We finished our analysis by categorizing each chapter into the focus area that best represented the chapter's content. Because many chapters included keywords that fell into multiple focus areas, we reviewed those chapters' abstracts and

Table 1 Overarching thematic areas, thematic foci, and example keywords

Themes germane to theme of edited volume	
Thematic focus	Example keywords
Race, Gender, Disability, and Intersectionality	Intersectionality, intersectional identity, gender, minorities, intellectual and physical disabilities, universal design for learning, accessibility
Critical Race Theory and Human Rights	Black history, racism, antiracism, human rights, critical race theory, critical pedagogy, indigenous values, abolition
Social Justice	Social justice, social inequality, reparations
Diversity, Equity, and Inclusion	Diversity, equity, inclusion, educational equity, inclusivity, student diversity, inclusive learning design, inclusive design
Culture and Identity	Culture, social identity theory, language learners, localized context of use, cultural framework
Themes representing other content and foci	
Thematic focus	Example keywords
Disciplinary Perspectives	Language, STEM, geomatics engineering, neuroscience, digital civics
Educational and Learning Contexts	K-12 education, informal education, libraries, elementary schools, higher education, continuing education, medical training
Learning Design Perspectives and Strategies	Instructional design, learning experience design, learning design, design justice, UX design, needs analysis, learner analysis
Instructional/Learning Strategies	Inquiry, critical thinking, culturally responsive mathematics teaching, appreciative inquiry, storytelling
Technology Perspectives	Online learning, mobile learning, technology adoption, digital divide, 3D virtual worlds, virtual simulation
Individual Foci	Learner agency, perspective-taking, ethical decision-making, sustainable development goals, power and positionality in research

Table 2 Index of thematic foci found in this edited volume and book chapters that included associated keywords

Culture and identity
1. Applying a Cultural Analysis Framework Before…
2. Character-Infused Virtue Ethics and Implications…
3. Cultivating a Mindset for Culturally Inclusive Learning…
4. Emotional Pathway of Becoming a Professional…
5. Instructional Design and Semiotics
6. Mobile Learning and Culturally Situated Practices…
7. Towards Culturally Inclusive Dialogue…
18. Forged in Fire…
23. UDL in Educational Technologies…
29. Transformative Learning Experiences…
30. “Faced with Given Circumstances”...
Race, Gender, Disability, and Intersectionality
1. Applying a Cultural Analysis Framework Before…
9. Accountability in Learning Design…
10. Audio Description for Three-Dimensional (3D) Virtual Worlds…
11. Being Cognizant of Diversity, Intersectionality, Privilege…
12. Expanding the Horizon…
13. On the Persistence of Pages
14. Supporting Teachers in Designing for Intersectionality…
15. The Effects of COVID-19 on Student Achievement Gap…
23. UDL in Educational Technologies for English Language Learners…
Social Justice
15. The Effects of COVID-19 on Student Achievement Gap…
16. Diversity, Equity, Inclusion, and Justice in Action…
17. Factoring Power and Positionality into Research…
18. Forged in Fire…
19. How Can Instructional Design Promote…
20. Libraries as Addressing STEM Equity Issues…
21. Social Justice Math as a Catalyst…
22. Trajectories of Student Engagement…
23. UDL in Educational Technologies for ELL…
25. Designing in Pursuit of Liberation…
29. Transformative Learning Experiences…
Critical Race Theory and Human Rights
9. Accountability in Learning Design…
11. Being Cognizant of Diversity, Intersectionality, Privilege…
21. Social Justice Math as a Catalyst…
24. Critical Instructional Design as Social…
25. Designing in Pursuit of Liberation…
26. Equity, Parents and Technology…
27. Human Capital, Rights, and Capabilities…
28. Reckoning with Racism in Medical…
29. Transformative Learning Experiences…

(continued)

Table 2 (continued)

Diversity, Equity, and Inclusion
3. Cultivating a Mindset for Culturally Inclusive Learning…
6. Mobile Learning and Culturally Situated Practices…
7. Towards Culturally Inclusive Dialogue…
8. Ableism Versus Inclusion…
11. Being Cognizant of Diversity, Intersectionality, Privilege…
16. Diversity, Equity, Inclusion, and Justice in Action…
17. Factoring Power and Positionality into Research…
20. Libraries as Addressing STEM Equity Issues…
23. UDL in Educational Technologies for ELL…
24. Critical Instructional Design as Social…
28. Reckoning with Racism in Medical…
30. "Faced with Given Circumstances"…
31. A Systemic Approach Toward Needs…
32. Adapting a Neuroscience High School…
33. Asking Better Questions…
34. Business Education for Responsible Leadership…
35. Centering Learner Agency and Empowerment…
36. Collaborative Experiential Learning as Trauma-Informed…
37. Developing an Inclusive Community…
38. Knowledge Sharing for Inclusive Learning…
39. Reimagining PBL to Develop Critical…
40. Using Technology to Foster Inclusion…

collectively discussed the content of those articles so as to make a final decision about which thematic focus best described the content and focus of that chapter. Each chapter was then classified using one of the five thematic focus areas. Upon completion of this process, eight chapters fell into the *Race, Gender, Disability, and Intersectionality* category, six into *Critical Race Theory and Human Rights*, eight into *Social Justice*, eleven into *Diversity, Equity, and Inclusion*, and seven into *Culture and Identity* (Fig. 2). We used this final classification to assign book chapters to one of five sections, which is reflected in the table of contents and organization of the current edited volume.

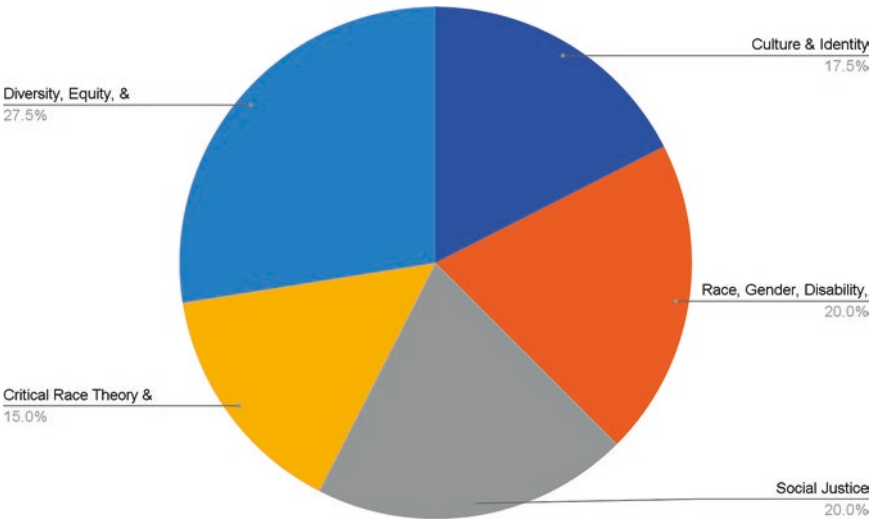

Fig. 2 Percentage of book chapters that fell into each thematic category

Conclusion

The analysis presented above highlights the breadth and depth of inclusive learning design included in this edited volume. One of the challenges of any exercise on inclusive thought is answering "for whom" and "how." As to the former, the analysis identified emergence in the areas of (a) Culture and Identity, (b) Race, Gender, Disability, and Intersectionality, (c) Social Justice, (d) Critical Race Theory and Human Rights, and (e) Diversity, Equity, and Inclusion. Within each of these different themes, various ideas emerged that highlight the extent to which inclusive design is needed within the instructional/learning design and technology community as it leverages technology toward more just and accessible learning. Some solutions repositioned existing topics within an inclusive lens (e.g., libraries, UDL), while others proffered topics often discussed outside the traditional learning design discussions, such as virtue ethics, ableism, and human capital. Yet others highlighted the devastating and pervasive impacts of COVID-19 pandemic and institutional racism. Each chapter highlights the embedded challenges and presents pathways toward more equitable learning experiences for all individuals who wish to learn. On this note, we present this edited volume *Toward Inclusive Learning Design: Social Justice, Equity, and Community* as a testament of the vibrant discourse within our community around this topic.

The Symposium Team
Brad Hokanson, Marisa Exter, Matthew Schmidt, and Andrew Tawfik.

AECT Staff
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Proposal Reviewers
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Contents

Part I
Culture and Identity

Applying a Cultural Analysis Framework Before Engaging in Large-Scale Learning Design Within Yunnan Province, China

Hongwu Dai and Dennis Cheek

Large-scale primary and secondary educational systems are difficult to effectively manage due to their scale, inherent complexities (e.g., personnel, curricula, instructional practices, examinations, diverse environments, and populations), and their loosely-coupled nature, no matter how centralized they might at first appear. They exhibit all the characteristics associated with technological systems of control, in that each of their components and varied interactions takes place within a human-designed system always focused on achieving certain near-term articulated goals while imposing throughout the system desired uniformity in learning experience and appropriate quality (McWalters & Cheek, 2000; cf. Green et al., 1997). But learning is influenced at individual and collective levels by broader cultural influences and these in turn are a product of distinct factors and contexts. How are we to properly account for the influence of these factors in our learning design efforts?

A group of French historians led by Lucien Febvre and Marc Bloch, established the scholarly journal *Annales d'histoire économique et sociale* in 1929 to feature a broader approach to history than just politics and institutions (continuing today as *Annales. Histoire, Sciences Sociales)*. A second-generation member of the *Annales School* was the distinguished French historian Fernand Braudel. He markedly influenced historians' understandings of their craft and methods with a series of breath-taking analyses on different topics, including the identity of France (Braudel, 1988,

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1990), the Mediterranean world in the age of Philip II (Braudel, 1972), and the development of civilization and capitalism in the 15th–18th centuries (Braudel, 1981, 1982, 1984). His approach to historiography, building especially on earlier work by Bloch, took account of three main aspects of change over time using the following French terms:

1. *La longue durée* – time periods of hundreds of years where climate, geography, and long-term economic forces shape human societies and cultures.
2. *Conjuncture* – periods of decades to a generation or so where social classes and other groupings of people as well as sociological and economic factors predominate.
3. *Évenément* – a series of events, institutions and people that appear and disappear; or alternatively, the traditional focus of most historical writing.

These three main levels of change within human societies and populations are hierarchical in terms of the power they exert regarding both scale and power. For example, geography and climate are first and foremost shaped by the movement of large tectonic plates in the past and continuing in the present, the work of volcanoes and glaciers, and geoscience processes like weathering and erosion. Climate, as distinguished from this week's weather, consists of long-term weather patterns and temperatures and involves forces exerted over vast areas (e.g., the world's oceans and volcanoes) and across varied terrains that bring significant global, regional, and local impacts. Where people *can* live, where they *choose* to live, and *how* they live across time are inexorably affected by geography (including climate), going back to the earliest human beings and continuing in the present.

A cultural analysis framework pulls all of these components together to develop a more informed perspective about the particular culture(s) in which we are seeking to do our design work. We see it as an important precursor to any learning design, but particularly so when designing large-scale projects and programs. Specifically, we will use for our cultural analysis framework the following five key components: (1) geography and climate factors, (2) history and anthropology factors, (3) economy and society factors, (4) politics and education administration factors, and (5) management styles and learning factors. None of these components by themselves are definitive in terms of how they shape culture. Anthropology, for example, neglects or frequently underplays the larger geographic, economic, and historical contexts exerting pressures over time periods outside the memories of the local communities that anthropologists study. Educational studies often focus on sociocognitive, nutritional, and school organization matters, while frequently underplaying the significant role of politics at national, regional, and local levels. This largely ignores the significance of local cultural variety and customs and longer historical and geographic contexts, including the history of education within a local area. Historical studies often focus on sociopolitical movements and players as they impact locals and their cultures, but frequently overlook or significantly underplay the mediating effects of local cultures and customs, local languages of discourse, geographic matters, and the impact of education of varied quality, duration, and access.

Our chief concern is the primary (elementary) grades public school system in Yunnan Province, PRC. This chapter focuses on the importance of geography and climate factors and history and anthropology factors to our learning design challenges in Yunnan. The chapter is the last in a trilogy with the other two articles focusing respectively on economy and society factors and politics and education administration (Dai & Cheek, 2021), and management styles and learning factors (Dai & Cheek, 2021). The complexities that confront us required more space than any single contribution allows.

Yunnan Province – Geography and Climate Factors

Yunnan Province is slightly smaller in size than the US state of California. The *Yuan Jiang* (Yuan River) divides the province into equal halves. East of the river one finds the Yunnan-Guizua Plateau at elevations of 1000–2000 meters (3280–6562 feet) above sea level. West of the river are the mountains of Yunnan at elevations of 4000–5000 meters (13,123–16,404 feet) above sea level. This diverse terrain includes high mountain chains, active volcanoes, deep valleys, hilly areas, flat terrain, and river basins. Portions of the province are subjected to regular earthquakes, severe monsoons (hurricanes), scorching heat, pleasant breezes, and blizzards. One can find jungles, arid regions, fertile soils, and abundant sources of fresh water, including more lakes than any province in China. Once one leaves the river valleys, cities, and towns, you experience pervasive rurality. Yunnan, with 48.3 million inhabitants according to recent estimates by the Yunnan Government (2019), has the fourth lowest population density in the nation, at 105 people per square kilometer. This results in numerous small schools scattered across the province, some even partly residential due to the long distances students must traverse and the dangerous routes they often have to take to reach the "local" school.

The mythical location of the fictional *Shangri-la*, Yunnan contains more than half of the flora and fauna species known within China. Three major river systems beginning in either SE Qinghai Province or the Tibet Autonomous Region travel in parallel within three valleys in Yunnan separated by tall mountains over 5000 meters high. The Salween (*Nujiang*) River then flows south through eastern Myanmar (Burma) to the Indian Ocean. The Mekong (*Lancang*) River flows south through Myanmar, Laos, Thailand, Cambodia, and Vietnam before emptying into the South China Sea south of Ho Chi Minh City, Vietnam. The *Jinsha* joins with other rivers to become the mighty *Yangtze* (*Chang Jiang*) and flows northeast past Chongqing, Wuhan, and Nanjing before emptying into the East China Sea near Shanghai. Two other rivers east of the capital Kunming, the *Nanpan* and *Beipan*, join to form the *Hongshui* River, which flows east to become part of the Pearl River just north of Guangzhou which continues east to the famous Pearl River Delta (Toops, 2003; Veeck et al., 2021).

A land-locked province, Yunnan is bounded by the two autonomous regions of Tibet to the northwest and Zuang (within Guangxi Province) to the southeast, as

well as the Chinese provinces of Sichuan to the north and Guizhou to the east. It adjoins the nations of Laos and Vietnam in the south and shares a long porous border with Myanmar to its southwest and west. (Veeck et al., 2021).

These various geographic and climatic factors certainly impinge significantly upon the people of Yunnan from year to year. The nature of the terrain and the resultant lack of paved roads and ready accessibility, present significant barriers to educational planning, delivery of educational services, adequate staffing of both administrators and teachers in these remote areas, and stable learning environments.

The next significant set of factors we will consider are those related to the long history of this Chinese province and the variegated ethnicities and cultures represented within its modern boundaries. There are also obvious interactive effects among geographic and climatic factors and historical and ethnographic factors within the province.

Yunnan Province – History and Anthropology Factors

Yunnan has a long history of habitation going back to prehuman ancestors such as *Yuanmou Man* and up through Bronze Age prehistoric times (Shuyang, 2007; Chiang, 2009). At various times portions of what is today's Yunnan were controlled by dynasties and peoples from what are now the countries of Myanmar, Thailand, Vietnam, Cambodia, Laos, and most importantly and extensively, China. Yunnan also experienced incursions from time to time by colonial powers such as Great Britain from Burma (now Myanmar), and France from French Indochina (today's Vietnam, Thailand, Cambodia, and Laos).

Due to its location and remote and difficult interior, Yunnan province was one of the last areas of today's PRC to be brought within the administrative system of classical China (Tanner, 2010). Even during these periods, control was concentrated in the more densely inhabited lower altitudes of the province. Tribes in the hills and mountains maintained their autonomy and were not subject to taxes, census, conscription labor, mandatory military service, or other obligations of imperial subjects (Scott, 2009). There is widespread evidence that informal trade was continuously undertaken by those who lived in the hills and mountains with peoples who occupied the valleys with both parties to such trade benefitting from unique goods and foodstuffs that the other lacked. This would set a longstanding pattern of interactions among what are today seen as "ethnic minorities" and the people who inhabited the valleys, most of whom assimilated into being part of the *Han* people (Scott, 2009).

By the time of the Qing dynasty (1644–1919) and subsequently, Yunnan and its current borders were controlled by China and the province was a center for resistance against the Japanese occupying the east coastal areas during World War II (Mühlhahn, 2019). During the Ming-Qing dynasties' violent transition in the mid-seventeenth century (Wong, 1995), many Ming soldiers continued their struggles

for many years out of the hills and mountains of Yunnan, ultimately melting into local ethnic populations and becoming one with them; a process repeated throughout China's long history as vanquished peoples joined ethnic minorities throughout the borderlands as a consequence of wars, shifting fortunes, and the desire to avoid mandatory conscription for labor and/or military service (Giersch, 2006; Scott, 2009).

Since ethnic minorities are clustered around regions associated with China's exceptionally long borders, these areas by virtue of their local geographies, histories, and distance from centers of Chinese power have led over the centuries to conflicts between the rulers in distant places and these local communities. Revolts lasted for decades, while others have simmered for even longer periods of time but with less violent manifestations (Tanner, 2010; Mühlhahn, 2019). It is thus important to note that this long history weighs upon decisions taken in the present by the national and provincial governments of the PRC as there are ample historical examples of widespread revolts with damaging consequences among China's borderlands.

Historically, ethnic minorities in China as we know them today are a very recent development in terms of formal recognition. Even from the time of the founding of the Republic of China (1912) after the revolution of 1911 to the driving out of the Nationalists (1949), it was widely understood that there were only "five races" who made up China (the *Han* (Chinese), Manchus, Mongols, *Hui* (Muslim "Han" people), and the Tibetans (Hutchings, 2000)). The *Han* people, today's overwhelmingly dominant ethnic group at about 90+ percent of the population, are themselves an amalgam of multitudinous ethnic groups (e.g., *Xianbei*, *Qiang*, *Jie*, *Di*, *Qidan*, and *Nü Zhen*) assimilated over the thousands of years of continuous cultural developments in China, a land whose Anglo name "China" was coined by Westerners, not the Chinese themselves (Carrico, 2017; Joniak-Luthi, 2017; Shuyang, 2007). Several dynasties who ruled China came from outside its borders and even though they adopted Chinese culture and ways, they continued to proudly acknowledge their "foreign" heritage up through and even beyond the establishment of the PRC (Tanner, 2010; Mühlhahn, 2019).

Today's ethnic minority classifications in China owe their origins to work undertaken in the early 1950s to construct the PRC as a "unified, multinational state made up of different peoples" (Mühlhahn, 2019, p. 414). A national census in 1953–1954 allowed groups to self-classify which resulted in more than 400 distinct groups being self-identified. The government then employed social scientists to reduce these groups to a desired, more manageable, number through the Ethnic Classification Project (ECP – *minzu shibie*). The scientists themselves reached back to a linguistics-based system first designed by a British army officer, Henry Rudolph Davies, who undertook a similar task in Yunnan province in 1894. The ECP began its new work in Yunnan since about 200 of the 400 self-identified groups resided there. The Yunnan groups were reduced to 25 and with 14 groups added from elsewhere, the government declared in 1954 that there were 39 formally recognized ethnicities. This number was expanded to 53 by 1964, 54 in 1965 with the addition of the *Lhoba* in Tibet, and 55 in 1979 with the addition of the *Jinuo* in Yunnan. Adding the *Han*

then made for 56 total government-recognized ethnic groups and with the end of the ECP in 1987, all 56 groups were told they could maintain their own languages, customs, and cultures (Mühlhahn, 2019: 414f.). This policy was reinforced by the government in 1984 by passage of the "Law of the PRC on Regional Ethnic Autonomy," which was last revised in 2001. Hu Jintao at the 17th National Congress of the Chinese Community Party in October 2007, stressed the need to "cement the great unity of the people of all ethnic groups, and enhance the great solidarity of all sons and daughters of the Chinese nation…" (Mühlhahn, 2019, p. 586).

Ethnographic studies of various ethnic minorities inside of China, as well as in neighboring nations, demonstrate quite convincingly that ethnicity, as defined by a certain language, group, or clan, is much more fluid than the stable labeling systems that have been created for China and other nearby nations' ethnic minorities. People move into and out of various groups, often acquiring competency in multiple ethnic languages as a consequence of these transitions. Ethnic groups who live closer to the lowlands often blend into the local *Han* population for time periods when it is socially, politically, and/or economically convenient to do so. When circumstances change again, they may cease to be "*Han*." Marriages across ethnic lines or the desire to marry coupled with the nonavailability of companions from one's own ethnic group may result in acquiring another ethnic "identity." Historically wars were also a source of continually changing allegiances and ethnic identities, including substantial numbers of *Han* fleeing into the hills and mountains and assimilating into other ethnic groups for purposes of personal safety, escaping military conscriptions or burdensome taxes, or having picked the wrong side in a war among *Han* peoples (Scott, 2009; Hutchings, 2000; Tanner, 2010).

About 16.2 million of Yunnan's 48.3 million inhabitants are members of about 50 government-recognized ethnic minorities (nearly 34% of the population), according to recent estimates by the Yunnan Government (2019). Yunnan ranks first in the nation in both the variety and numbers of its ethnic minorities; the bulk of these minorities live in areas where they are intermingled with other minorities as well as the overwhelmingly numerous *Han* population. The 25 largest ethnic groups within the province having populations of 5000 or more, include the *Yi, Hani, Bai, Dai, Zhuang, Miao, Hui,* and *Lahu*. These ethnic groups move freely and frequently back and forth across the borders of the various autonomous regions, provinces, and countries that surround Yunnan, often merging with other related people groups in these surrounding countries for short or longer periods of time depending on diverse circumstances and situations.

More than 80% of the ethnic minority populations in Yunnan Province live in mountainous areas, and 13 distinct ethnic groups live within the porous border regions. Eighty percent of the more than 13,000 primary (elementary) schools in the province are distributed across these remote mountainous areas and isolated from larger population centers. There are over 4000 boarding schools in ethnic regions for primary up through upper secondary students. In 2016 there were 496 national government designated ethnic primary and secondary schools and an additional 41 provincial designated ethnic primary and secondary schools. These are schools that are overwhelmingly comprised of ethnic minorities. Other minority students make

up substantial portions of other schools scattered throughout the province, but especially in the rural areas that comprise much of the province's land area. Most rural schools are small and have less than 100 students (Lei & Zhang, 2014). The government reported that at the end of 2015 there were 3,350,100 ethnic minority students in the province from preschool through secondary levels. Minority students accounted for 38.6% of the population of primary (elementary) schools within Yunnan (Yunnan Provincial Department of Education, 2020), due in part to the fact that ethnic minorities were frequently not subjected to the now rescinded national one-child policy.

Students and their families face enormous challenges getting to and from school in ways analogous to the countries profiled in the fascinating and sobering TV series called *The Most Dangerous Ways to School*. These episodes reveal primary school children's long, treacherous and exhausting daily or weekly (for residential students) treks on foot or using multiple conveyances to their neighborhood school. They walk rickety bridges or use hazardous zip lines to cross dangerous gorges, ford rivers, contend with icy surfaces and abundant snowfalls, skirt wild and deadly animals, and battle heat, insects, hunger, and exhaustion.

Ethnic languages within Yunnan are diverse with multiple languages in daily use in the same regions. Twenty-three of the 25 largest ethnic groups have their own languages, and 14 of these languages have been recently taught as mother tongues in schools within the minority-majority ethnic areas. Recent pronouncements at the national level and actions taken in other provinces with significant numbers of minorities in Northeast China and the far West of China may indicate that the continued teaching of minority languages may be about to change throughout other parts of the PRC. At the very least current tensions around languages other than those associated with the Han people appear to be spreading.

An increased focus on the importance of the anthropology of education within the PRC emphasizes the changing natures of human societies and the need for all Chinese learners to become more aware of and more adept at understanding and cooperating with people from diverse cultural backgrounds who are likely to also hold different ideas, views, and values. Cultural differences can be identified within large and diverse nations like China with differences in accents (when speaking a *lingua franca*), food preferences, attire, social customs, second language choice, etc. Educational settings play a key role where the organized and systematic acquisition of soft skills and their applicability to varied sociocultural situations can be explored, practiced, and improved (Ba, 2021).

Yunnan Province – Politics and Education Administration Factors

The public schools of the PRC (and even most private schools) must conform to the curricular objectives, educational goals, administrative and human resources procedures, and examinations systems of the national government. Standards, textbooks, instructional strategies, and examinations are centrally controlled, created, and promulgated nationwide. On an international continuum of standardization across schools in terms of the prescribed curriculum, the PRC would rank as one of the more standardized systems in the world.

The nation's provincial ministries of education are responsible for all educational activities within their respective province as extensions of the national government. Provincial educational officials have extensive powers to intervene in any educational situation where it is deemed essential to the effective execution of the government's mandates for schooling. The provincial ministries are assisted in their work to improve instruction in schools by the national system of state normal universities, i.e., large state universities that produce the overwhelming bulk of the nation's new teachers and provide professional development for existing teachers, administrators, and other school staff. Yunnan Normal University is the main producer of teachers for the province and has a longstanding professional development program for teachers and specifically for principals of both primary and secondary schools.

The *People's Daily* in China published an article in 2014 by President Xi Jinping advocating students of all ethnic groups should "understand each other, respect each other, tolerate each other, appreciate each other, learn from each other, help each other, and hug each other like pomegranate seeds" (Xi, 2014). Geographers have also noted that there are significant interactive effects among geographic features, economic development, and educational development throughout China (Li & Yin, 2021). Geographic isolation inhibits connectivity which in turn negatively impacts further financial and economic activity. The diminished nature of such activities in these areas directly impacts the availability, accessibility, and quality of educational resources as well across all age groups. They suggest tighter and better coordination among educational, economic, and social development efforts in these geographically challenging places throughout the nation because of these interactive effects.

Wu (2020) noted that within education in border ethnic areas such as Yunnan, it is considered vitally necessary to continuously enhance ethnic students' recognition of the outstanding culture of the Chinese (overwhelmingly *Han*-dominant) nation. The purpose of this educational effort is to prevent ethnic separatists located on China's border areas from propagating false statements and undermining national unity. This concern has led to the implementation of additional social functions to compulsory education. These additional social functions provided by the compulsory education program in ethnic areas brings a substantial increase in tasks for frontline teachers. The required diversified educational services pose significant challenges to teachers' knowledge levels, language abilities, and working styles.

Teachers' teaching energy is diffused by all these requirements and teaching quality inevitably decreases as such policies are implemented (Wu, 2020).

Zhang and Fan (2019) remind us that future changes to education throughout the nation will take place within the context of stages of reform and developments in the organizational structure of China's primary and secondary schools over the past 70 years. Zhang and Fan (2019) document that since 2001, primary and secondary schools have successively established a school-based management system that combines government coordination, social participation, and independent school management. Consistent with school systems everywhere in the world, China's schools are under fairly constant exposure to varying new reform measures to improve teaching and learning. The need for greater consistency within and across these school systems is becoming a more prominent theme, especially as it relates to areas inhabited by significant numbers of ethnic minorities as well as rurality and its predominating effects. This requires more sophisticated, well-articulated, and widely known and practiced models of teaching that narrow gaps in compulsory education and improve learning results (e.g., Yuan & Zhu, 2020).

On December 21, 2020, the website of the Yunnan Provincial Department of Education (2020) announced the reform of the various titles bestowed on principals of basic education schools throughout the province. A new professional ladder system for principal designation and advancement will be implemented based on the "scientific evaluation" of the principal with the resultant creation of a new series of professional ranks. The main purpose of this reform is to establish a development system, "promote the continuous growth and progress of principals," and establish a "professional job evaluation system" for principals at all levels of primary and secondary education.

Wu (2020) conducted field investigations on the development of compulsory education in nine ethnically-concentrated provinces, including Yunnan. According to his team's investigation, the development of compulsory education in ethnic areas still faces difficulties and problems, such as the diversification of education supply functions, special school administration units, high school operating costs, and a poor supply of teachers. The difficulties and challenges of rural schools in Yunnan are similar to situations of rural schools in the United States (cf. Kinkley, 2019; Lackey, 2019) although there remain differences too in both degree and kind.

Conclusion

This chapter, along with its two companion articles published separately, provides ample evidence of the need to engage in extensive cultural analysis before daring to engage in learning design regarding the professional development of principals who lead public primary (elementary) schools across the vast and highly diverse province of Yunnan. Only by employing a more sophisticated and substantial approach to understanding the complex interactive effects of the five factors within this cultural analysis framework can we hope to make significant impact.

References

Ba, Z. (2021). Mai xiang xin jiao yu ren lei xue. [Towards the "new anthropology of education" – the conception and interpretation of the new paradigm of the anthropology of education]. *Educational Research, 8*, 59–68.

Braudel, F. (1972). *The Mediterranean and the Mediterranean world in the age of Philip II*. Harper & Row, two volumes. Translated by Sian Reynolds.

Braudel, F. (1981, 1982, 1984). *Civilization & capitalism 15th – 18th century*. Harper & Row Publishers, three volumes. Translated by Sian Reynolds.

Braudel, F. (1988, 1990). *The identity of France*. Harper & Row Publishers, two volumes. Translated by Sian Reynolds.

Carrico, K. J. (2017). *The great Han: Race, nationalism, and tradition in China today*. University of California Press.

Chiang, P. (2009). *Archaeology of ancient Yunnan: Sichuan influence in the transformation of the Shizhaishan culture*. VDM Verlag.

Dai, H., & Cheek, D. (2021). Designing effective learning experiences for diverse and scattered minority groups across Yunnan Province, China. In M. Simonson & D. Seepersaud (Eds.), *Proceedings of the 2021 AECT international conference, USA* (Vol. 43(2), pp. 373–382).

Dai, H., & Cheek, D. (2021). Culturally and situationally appropriate professional development for elementary principals of ethnic majority schools in Yunnan, China. In M. Simonson & D. Seepersaud (Eds.), *Proceedings of the 2022 AECT international conference, USA, 44*(1), 74–84.

Giersch, C. P. (2006). *Asian borderlands: The transformation of Qing China's Yunnan frontier*. Harvard University Press.

Green, T. F., Ericson, D. P., & Seidman, R. H. (1997). *Predicting the behavior of the educational system*. Educator's International Press, Inc.

Hutchings, G. (2000). *Modern China: A guide to a century of change*. Harvard University Press.

Joniak-Luthi, A. (2017). *The Han: China's diverse majority*. University of Washington Press.

Kinkley, I. C. (2019). *Population change and principal leadership behaviors in US rural schools*. PhD dissertation, Michigan State University, K-12 Educational Administration.

Lackey, E. H. (2019). *The relationship between the supportive principal behavior dimensions and teachers' perceptions of self-efficacy in rural schools.* Ed. D. dissertation, Lincoln Memorial University.

Lei, W., & Zhang, X. (2014). Exploring the development policy of small-scale schools in rural areas. *Educational Research and Experiment*, 654–658.

Li, Z., & Yin, J. (2021). Wo guo jiao yu de kong jian fen xi ji qi po jie lun lue. [On the spatial differentiation of education in China and its solution: A discussion from the perspective of geography]. *Contemporary Education and Culture, 13*(1), 24–32.

McWalters, P., & Cheek, D. (2000). A state accountability system as a technology of social control: The case of Rhode Island, USA. *Evaluation and Research in Education, 14*(3/4), 268–276.

Mühlhahn, K. (2019). *Making China modern from the great Qing to Xi Jinping*. Belknap Press of Harvard University Press.

Scott, J. C. (2009). *The art of not being governed: An anarchist history of upland southeast Asia*. Yale University Press.

Shuyang, S. (2007). *A reader on China: An introduction to China's history, culture, and civilization*. Better Link Press.

Tanner, H. M. (2010). *China: A history. Volume 2: From the Great Qing Empire through the People's Republic of China*. Hackett Publishing.

Toops, S. W. (2003). China: A geographic preface. In R. E. Gamer (Ed.), *Understanding contemporary China* (2nd ed., pp. 11–28). Lynne Reinner Publishers.

Veeck, G., Pannell, C. W., Shen, X., & Huang, Y. (2021). *China's geography: Globalization and the dynamics of political, economic, and social change* (4th ed.). Rowman & Littlefield.

Wong, J. (1995). *Discrimination, corruption, and moral decline: The historical background of the Muslim Hui uprising in Yunnan, China, 1856–1873*. Harry S. Truman Research Institute for the Advancement of Peace, The Hebrew University of Jerusalem.

Wu, H. (2020). Ji ben jun heng ben jing xia min zu di qu yi wu jiao yu fa zhan yan jiu [A research report on balanced development of country compulsory education in minority areas of China]. *Journal of Central China University, 59*(5), 166–174.

Xi, J. (2014, May 30). Tuan Jie Ge Zu Ren Min [Unite people of all ethnic groups]. *CPC News*. http://cpc.people.com.cn/n/2014/0530/c64094-25083518.html

Yuan, T., & Zhu, X. (2020). Fa zhan Min zu di qu jiao yu shiye, zhu lao Zhonghua minzu gongtongti yishi. [Developing education in ethnic minority areas to strengthen the community awareness of the Chinese nation]. *Journal of Northwest Normal University, 57*(1), 22–29.

Yunnan Government. (2019). *Ren kou ji min zu gai kuang_Yunnan sheng run min zheng fu*. (Population and ethnic profile, Yunnan Provincial People's Government Portal). (2020, May 6). http://yn.gov.cn/yngk/gk/201904/t20190403_96251.html

Yunnan Provincial Department of Education (2020, December 21). *Implementation opinions of the Yunnan Provincial Department of Education on the reform of the principal rank system of elementary education schools*. Yunnan Provincial Committee of the Communist Party of China, Education Working Committee. https://jyt.yn.gov.cn/web

Zhang, X., & Fan, J. (2019). 70 nian: Zhong xiao xue zu zhi jie gou de biange yu fa zhan [70 years: The transformation and development of the organizational structure of primary and secondary schools]. *School Management, 9*, 14–19.

Character-Infused Virtue Ethics and Implications for the Design of Character Development Training

Pamela C. Moore and Begüm Saçak

Thomas (2003) highlighted the fusion of instruction design and ethics by stating, "Our design work and what results from this work are inextricably bound with issues that are essentially ethical in nature" (p. 34). Given the presence of multiple cultural factors at play, instructional designers may encounter various ethical issues as a part of the intersectional position they hold in their organization, especially as they are involved in character development design, which requires instructional designers to promote certain cultural values and virtues that ideally constitute "desirable character traits." The ethical dilemmas encountered by instructional designers can be contextualized in three main cultural views: (a) An organization or institution's approach or mandates to core cultural values; (b) instructional designer's own values, character traits, and views; and (c) learners' values and culture. In this chapter, the character-infused decision-making approach based on virtue ethics will be presented as a potential framework to be adapted in the context of instructional design, character training design, and the intersectionality of the instructional designer's position.

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Character-Infused Virtue Ethics: An Introduction

According to the Stanford Encyclopedia of Philosophy (2016), virtue ethics is an approach that emphasizes the virtues, or moral character, in contrast to the approach that emphasizes duties or rules (deontology) or that emphasizes the consequences of actions (consequentialism). Scholars Nguyen and Crossan's (2021) recent framework called "character-infused decision making" combining the character of a moral agent with decision- making mechanisms for making ethical decisions within the business context. The strength of a character-infused virtue ethics approach is that it is both bound by the situational context as well as the character of the moral agent. As the moral agent engages in virtuous acts over and over, the decision-making mechanisms can be strengthened.

Instructional designers could also benefit from this approach when handling ethical dilemmas as virtue ethics could, in fact, minimize "the individual and collective experience of what are often dysfunctional influences of the context" (Nguyen & Crossan, 2021, Future Research Agenda and Conclusions section). These influences of context can arise from different cultural backgrounds, an organization or institution's approach or mandates to core cultural values, instructional designer's own values, character traits, and views, and learners' values and culture. In the next section, these cultural views are explained within the context of instructional design.

Ethics and Three "Cultural" Views in Instructional Design

We begin the discussion of ethics and cultural views in instructional design by first defining the term culture. Reacting to the argument by Jahoda (2012) that culture is impossible to define, Mironenko and Sorokin (2018) propose that culture is "a multidimensional phenomenon that encompasses processes, products, and results of human activity, material and spiritual, transmitted from generation to generation in a non-biological way." Furthermore, these various aspects of culture are synthesized and evident in the actions of an individual (Mironenko & Sorokin, 2018, p. 338). In this chapter, then, we refer to culture as a full phenomenon that is intrinsic to an individual or organization of individuals and influences the behavior of an individual.

What is the significance of culture in the process of designing instruction? To answer this question, we must first conceptualize the relationship of the instructor, the learner, and the employing organization. In the process of creating a learning module, there is an obvious connection between the instructional designer and the learner. That is, the instructional designer creates a learning module for the learner. With the proposed definition of culture, it is safe to assert that an instructional designer embodies a particular cultural viewpoint when designing a learning module. Likewise, the learner embodies a particular cultural viewpoint in the process of learning.

The instructional designer is also employed by an organization. It is also reasonable to assert that the organization itself has a cultural viewpoint that is influential in the process of instructional design. Literature is replete with the idea that an organization has a culture of its own. For instance, Kwantes and Glazer (2017) argue that since an organization is a social system of individuals with a common goal, then the organization itself has a culture that uniquely synthesizes the stakeholders' cultures in fulfilling the common goal. Lepeley (2021) further defines organizational culture as essentially the "personality" of the organization, which began with the values of the organizational founders (p. 4).

So, the organization has a culture, but does the organization's culture affect the design process? The answer is yes when you consider the professional ethical demands on the instructional designer. There are several mandates in the AECT Code of Ethics related to the culture of the learner and the employing organization as it applies to the professional conduct of the instructional designer. First, the code of ethics speaks to designing instruction for the benefit of the learner. Section 1 indicates the commitment to the learner: "In fulfilling obligations to the individual learner, the member: Shall protect the individual learner's rights of access to professional or instructional materials of varying points of view" (Association for Educational Communications and Technology, 2018). This mandate would imply that the instructional designer must consider the learner's culture in designing educational materials.

Section 2 speaks to the instructional designer's commitment to the organization. "In fulfilling obligations to society, the member: Shall accurately represent the member's institution or organization and take adequate precautions to distinguish between personal and institutional or organizational views" (Association for Educational Communications and Technology, 2018). This second mandate would indicate that the instructional designer must be cognizant of the organizational views in designing instruction. By implication, the instructional designer must avoid infusing personal cultural views into the product that may differ from the employing organization's cultural viewpoint.

To assume that three cultural viewpoints have the potential to influence the end-product of instructional design is reasonable: the learner, the organization, and the instructional designer. (See Fig. 1) Although the intersection of the three cultural viewpoints may not be of equal import, as depicted by the gray area in Fig. 1, each viewpoint must be considered in designing instruction if the instruction is to be ethically inclusive. Perhaps, the most poignant illustration of the ethical challenges inherent in the intersection of these three cultures is in the design of character development training.

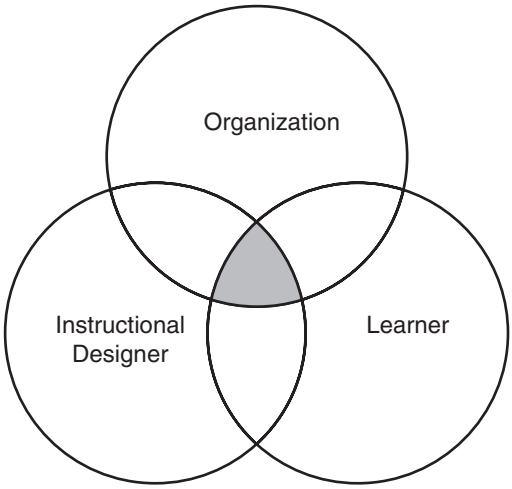

Fig. 1 The intersection of cultural viewpoints

An Example in Character Development Design

Character development is a current need in many types of organizations, such as secular, religious, military, healthcare, universities, and schools (Arbuckle, 2013; Baker, 2019; Berkowitz et al., 2020; Blakeley & Higgs, 2014; Dam et al., 2019; Kress & Rotstein, 2018; Lerner, 2018; McKay, 2013; Sohail et al., 2018; St. Peters & Short, 2018). While character is inextricably linked to culture, the design of character development curricula proves to be a good example of the intricacies of designing with cultural considerations. The following sections will highlight the need to equally consider the culture of the organization and the culture of the learner in character development design while being cognizant of the effects of the cultural biases of the designer.

The Importance of Cultural Considerations

The way a character trait is expressed or repressed may vary depending on the social context. One influencer is the moral code of the social group, which establishes a value system of character traits. This social value system informs the group member of which character traits should be displayed and developed (Moulin-Stożek, 2019). Since the social group dictates the desirable character traits for an individual, the instructional designer must know the preferences of the hiring organization concerning which character traits are desired within the organizational context. At the same time, the instructional designer must be cognizant of desirable character traits of the employee's culture in case there is a misalignment with the organization's desirable character traits.

For example, Eastern culture views family considerations in employment opportunities as an ethical business practice. In this culture, considering the employment of relatives displays the character strength of justice because of the high value placed on putting one's family first. In contrast, Western culture views this practice as unjust behavior because a higher value is placed on the community or society over family considerations (Sison et al., 2020). If the employee from an Eastern culture is responsible for hiring in an organization whose culture aligns with Western culture, imagine the difficulties an instructional designer may face in designing professional training on equitable hiring practices with this type of learner.

In addition to considering the cultures of the learner and the organization, the instructional designer must also be aware of cultural differences in the learners when designing character development training. Researchers Johnson and Hinton III (2018) have strongly argued that cultural differences should not be separated from character development considerations. For example, to train youth to be global citizens, it would be counter-intuitive to base character education curricula on a single culture, such as the prevalent Western culture in many character education programs. Omitting important cultural considerations can lead to a cultural gulf that may limit one's sense of freedom to express cultural differences (Johnson & Hinton III, 2018).

Ethical Dilemmas for Cultural Inclusivity

Instructional Designer's and Organization's Culture

Perhaps, one of the most challenging dilemmas occurs when the values and training mandates or institutional values of the organization do not quite match that of the instructional designers' core values. Most institutions do promote a set of specific values and invite their employees to follow those values in the workplace. As an example, Arbuckle (2013) and Baker (2019) have expressed their views that the Catholic identity and goals of a Catholic organization should trump the cultural identity and concerns of an employee, including the design of any training program. The U.S. Army has a set of core values expected to be exhibited by commissioned officers (Murray et al., 2021). Religious education often instills religious values in the learners (Hussin & Tamuri, 2019; Labosier & Labosier, 2018). However, what happens if the instructional designers' values or cultural beliefs clash with the employing organization is unknown? It might be the case that oftentimes organizations and their employees share a similar set of values in the first place; however, the those values or cultural approaches can diverge minimally, or in some cases, the mismatch could be too significant that the end product (the training) may not be of expected quality given the organization's expectations, or the instructional designer may opt-out of the design work.

It's important to understand the designer's character within the context of the organization as. According to Gray and Boling (2016), designers actively inscribe values in the objects or artifacts that they design, sometimes without even being aware of them. The impact of these values, however, goes beyond the designs themselves as these designs influence social systems and perpetuate behavioral norms for a longer period of time (Gray & Boling, 2016). The effects can be significant and lead to what we might call designer's bias. The bias and differences in ethical approach could be more visible in character education training design. There could be a fundamental disagreement on how character education should be designed based on to what extent designers' values diverge from that of the organization they work for.

Instructional Designer's Inherent Worldviews, Values, and Culture

Another difficult dilemma that instructional designers face is that all instructional designers bring with them their own set of values, culture, and inherent worldviews. Paraphrasing Thomas and Marlon Mitchell (2002), Parrish and Linder-VanBerschot (2010) observe that the worldview of the instructional designer "cannot be separated from the training that they develop" (p. 2). Parrish and Linder-VanBerschot (2010) point out that if the instructional designer is unaware of or does not consider personal cultural biases in designing instruction, the effectiveness of the instruction may be at risk. As a result, when chosen instructional strategies, communication, and student expectations are not tailored for cultural sensitivity, knowledge construction may be affected (Messitidis, 2018).

One of the factors that exacerbate this issue could be the potential lack of multicultural awareness in the instructional designer. Instructional designers may not have the necessary training to accommodate and address cultural diversity in the trainings that they design. In a qualitative study of 40 online instructors, the results highlighted barriers to designing a collaborative learning environment in online instruction for multicultural learners (Kumi-Yeboah, 2018). One of the identified challenges was the lack of training to ensure cultural diversity in the instruction. Another challenge was the advance identification of the cultures represented by the learners. Furthermore, extensive and detailed knowledge may be mandatory for adequately designing training for specific character traits. For instance, gratitude can be expressed differently and have different motivations depending on the culture. Morgan et al. (2015) give the example of the Tamil culture where gratitude is not always felt toward the beneficiary if the benefactor is of a higher social status. In this culture, those of higher social status have a duty to provide for those of lower social status. In such a case, the beneficiary may feel a sense of entitlement instead of gratitude.

One of the pressing issues is how to address a range of cultures while designing learning experiences. Should instructional designers choose primary cultures and omit the other multicultural possibilities? Parrish and Linder-VanBerschot (2010) point out that time constraints, budget constraints, organizational goals, and even an end-goal of assimilation of the learner into mainstream culture can limit the robustness of cultural inclusivity in instructional design.

Campbell and Schwier (2014) suggest that instructional design models and approaches could also have a limiting effect on cultural inclusivity. In fact, the need to design for plural cultures is normally at odds with the need to design for a specific culture since traditionally, instructional design models and approaches advocate for identification and narrowing down the audience in the first place: "User-centered principles of instructional design suggest that a precise and narrow articulation of an audience can lead to optimal learning designs, a proposition that seems axiomatic" (Campbell & Schwier, 2014, p. 358).

Though this kind of approach could have its own benefits, such as meeting the needs of a certain audience, these trainings can often be shared without regard to the audience for which they were originally designed (Campbell & Schwier, 2014). As an example, a specific character training initiative can be used by audiences or learners with varied cultural backgrounds— different from the audience for whom the training(s) are originally designed. All these considerations point to the implication that designers need to be inclusive of all cultures by considering the future effect of their work on learners; however, this is a dilemma that instructional designers face given their own cultural background and possibly a lack of multicultural awareness.

Learner Values and Cultural Views

Learners as the audience and receivers of the training are also an important part of the equation, specifically in terms of how well these trainings are received by the target audience. When learners receive character education training, the nature of such training is interwoven with ethical values or, in some cases, mandates that have been deemed appropriate or necessary by the organization and/or instructional designers. At the same time, it is important for designers to recognize that there will likely be a great diversity of experiences that learners will bring to a course or other learning experience (Gronseth et al., 2020).

Viewing learning from learners' perspectives also results in challenging dilemmas and questions that need to be answered. In character education training design, what is the ethical pathway when a particular value in the training has negative connotations for the culture of some learners and positive connotations for the culture of other learners? One suggestion could be identifying cultural background and learning more about the cultures represented by the learners (Cifuentes & Ozel, 2006; Gronseth et al., 2020). However, finding a compromise or a middle way to

convey the intended training messages while ensuring the culturally insensitive material is at minimum for a wide audience could be a challenge.

Secondly, not only instructional designers' values could clash with an organization's or institution's values, but also the learners' values or culture may not be compatible with the mandates for character training by the employing organization. Learners, especially learners from diverse backgrounds who don't belong to mainstream culture, might and likely have different views of what constitutes desirable character traits. Culturally relevant training recognizes the culture of diverse learners and uses their culture and attributes to maximize their learning (Gronseth et al., 2020; Howard, 2012). However, if an organization fails to attain culturally relevant training requirements, especially when the organization's culture or mandates are different from that of learners, what is the best path to follow? If such misalignment exists between the cultural characteristics of the learner and the employing organization, should the instructional designer act as an advocate for the learner?

Through the ethical dilemmas and questions raised in this section, it is suggested that instructional design is an inherently ethical practice as it involves value judgments about what is considered as "good" or "bad" as attested by Gray and Boling (2016):

> Instructional design is ethical in the sense that it deals with designing futures (e.g., artifacts, experiences) that do not currently exist; these futures are presumed by the designer and/or stakeholders to improve conditions (a value judgment about what may be good or bad for the learner), consistent with a socially defined understanding of the "good life" design, and how an ethical awareness might alter our understanding of the commitments of professional practice (p. 974).

Questions to ethical dilemmas raised in this paper are not exhaustive and have no definitive answers, but there is an urgent need for a conversation around the intersectionality of the instructional designer's position as it relates to character education training designs, their respective organizations, and most importantly, learners. It's important to remember that instructional designers bring training plans into life, and their designs could have a long-lasting impact beyond the immediate training needs that have the potential to affect social systems and influence behavioral norms (Gray & Boling, 2016).

Finding Harmony in Cultural Differences

Given the ethical dilemmas and multiple dimensions present in character education design, instructional designers' ethical decisions and approaches to design intersect with the organization's values they are involved in, as well as the target audience for whom they design (see Fig. 1). At the intersection lies the presumably ideal ethical approach or harmony towards instructional design and character training.

How then can instructional designers attain a level of culturally and ethically solid character design considering the intersectionality of the positions? Perhaps, the character of the instructional designer and insights from virtue ethics can be

central to answering some of these ethical questions since the nature of the moral agent [instructional designer in this context] could provide critical insights into ethical decision making in a more broad sense (Nguyen & Crossan, 2021). Although the examples and literature are centered around the unique dilemmas of cultural considerations in instructional design, a decision-making mechanism based on character and virtue ethics could be used as an approach to find a solution to any ethical issues that arise in instructional design.

In the Nguyen and Crossan (2021) framework, ethical decision-making consists of awareness, judgment, intention, behavior, and reflection—concepts that a moral agent's character exhibits, which are bound by the situation or context. Each component of the decision-making process is influenced by personal virtues such as integrity, temperance, humility, and courage, to name a few. In other words, the character of a person or a moral agent enters and influences each of these components such that any of these decision-making components can be either strengthened by a strong character or compromised by a weak character (Nguyen & Crossan, 2021).

Considering the ethical role instructional designers play in crafting learning experiences or designs (Gray & Boling, 2016), this particular framework could provide approaches on how difficult ethical dilemmas, especially those that are bound by the context, or the different stakeholders involved from a character-based perspective.

Awareness

Moral awareness emerges when the moral agent recognizes an event to have moral qualities or consequences (Nguyen & Crossan, 2021; Rest, 1986). One of the issues with awareness is that the dominant culture and their respective expectations can be preferred over other ethical values. In the instructional design field, this could be the case when the design targets a primary culture's values by possibly omitting other cultural considerations. Even worse, what is considered ethical or acceptable for the primary culture might not be ethical or the optimal choice for other cultures. As an example, if a character-training for a religion-based organization promotes certain character traits or even language that are particular to that religion, the training may not be as effective for learners who do not share a similar background or even for the instructional designer if they subscribe to a different set of values or ethics. In addition, the aforementioned designer's bias—the designer's own unconscious biases and beliefs—can also have an impact on the learning experience.

Being aware of the context and ethical underpinnings requires a knowledge of what actions are possible and what parties are involved as well as what resulting consequences might occur. When the character of the moral agent is involved, the perspective of the moral agent could be more proactive rather than a passive one. Still, the ethical questions or dilemmas may not be easy to resolve or even define in the first place. How should an instructional designer handle the challenging task of

becoming aware of the existing ethical dilemmas, possible solutions, or their own biases in the first place? Within the context of character-infused virtue ethics framework, instructional designers' strong character traits and their belief in universally accepted virtues such as being able to empathize with all parties, trying to understand different viewpoints, and coming from a place of compassion for the learners as well as acknowledgment of diversity could result in better awareness for immediate training concerns as well as future design challenges. This character strength could also be developed since moral awareness is not a one-time occurrence but rather an emerging process (Monin & Jordan, 2009; Nguyen & Crossan, 2021), which means a moral agent can and should revisit the issue from different angles at different points. Instructional designers can immerse themselves in different cultures and viewpoints, solicit learner feedback, and seek formative evaluations to create awareness of cultural differences (Rogers et al., 2007) not only for one instance but rather on an ongoing basis.

Judgment

Judgment is "the deliberation of the possible courses of action and deciding which course is morally right" (Nguyen & Crossan, 2021, p. 11). Moral judgment is heavily affected by the context, as well as the activation and prioritization of certain norms. The characteristics of the issues, as well as the context, can also activate particular values and schemas associated with certain roles or identities an individual has formed to influence moral judgment (Nguyen & Crossan, 2021). The crucial question is how a person makes changes or takes the presumably right course of action while exercising judgment once they become aware of a moral dilemma.

A character-infused virtue ethics framework is based on the assumption that virtues are universally accepted for humans' well-being and betterment. One's character can help the moral agent in responding to the contextual influences by reprojecting which values need to be emphasized by preferring virtuous values over non-virtuous ones. However, one crucial point is that personal moral values alone are not enough to make judgments; rather, judgments should be based on universal virtues.

Judgment, especially ethical judgment, is a part of the intersectional role that an instructional designer assumes in considering the need to create learning experiences that meet learner needs as well as organizational needs. An example would be a character training setting where a certain promoted moral value or character trait/behavior has negative connotations for some learners. An instructional designer should exercise judgment on how to navigate the components of such training. Judgment is also crucial, especially when an instructional designer lacks the necessary cultural awareness to be able to create a well-designed character training for learners. Instructional designers, as needed in all professions where judgment is needed, must apply practical wisdom or judgment to determine how it should be applied in particular situations and when departures are warranted (Nguyen & Crossan, 2021; Thiele, 2006).

The character of an instructional designer also plays an important role in responding to contextual influences in terms of determining which values an individual should serve by highlighting and prioritizing universal and virtuous values. If instructional designers possess an internalized knowledge of universal virtues and can incorporate these virtues (such as courage, humanity, integrity, etc.), the resulting character training could appeal to a wide variety of audiences.

Intention and Behavior

Ethical intention refers to the planned action or what an individual has in mind to do (Nguyen & Crossan, 2021; Rest, 1986). As in judgment and awareness, universal virtues are an important part of one's intention, as individuals who possess strong, virtuous values are more likely to integrate these universal values into their practice.

Intention may not always be purely ethical since situational forces can sometimes require the selection of non-universal values over moral ones. As an example, in character training development, an organization could mandate an instructional designer create training based on organizational values. Instructional designers can often comply with organizational mandates and values by preferring the values of organizations/institutions over potentially more inclusive or universal values. This preference is, in fact, a challenge to a character as it might lead to "a lobotomy of personal character" (Nguyen & Crossan, 2021, p. 12). One of the strengths of character-based virtue ethics is that a moral agent with a strong character should be able to distinguish universal values from other values. Though this is a difficult act, which might require an instructional designer to determine what inclusive character training looks like and move the organization in a particular direction, the character can be influential in terms of choosing the moral course of action to take.

Intention alone, however, is not the sole or the main factor when it comes to acting or demonstrating moral behavior. Past habituated behaviors could have more impact on subsequent behaviors than intentions or conscious decisions. These behaviors, through repetition, could become the norm. It takes courage and a strong character to form good habits and practice moral behavior; in other words, moral virtues should be an important part of an individual's identity (Nguyen & Crossan, 2021; Rest, 1986).

The intention of a moral agent and the courage to follow through the moral intentions could also be related to awareness; being aware of moral dilemmas and exhibiting moral actions within a particular context are key to ethical decision making. For an instructional designer, ethical behavior is the visible part of a training or learning experience where the designer can incorporate their understanding of universal virtues into character education training. The end product or learning solution, therefore, exhibits the embodied values of an instructional designer. The challenge is incorporating organizational values while complying with core ethical values. It is improbable that a subjective piece of training such as character training can be designed by attaining ethical perfection. But it's only when the virtues are an

important part of an instructional designer's own identity they can exhibit these moral values.

Reflection

Reflection is perhaps one of the most important components of the ethical decision-making process, which "brings the moral agent to the fore by recognizing that the agent has a choice to make, including the boundaries of the choice" (Nguyen & Crossan, 2021, p. 16).

Through the reflection process, an instructional designer can realize the role of a dominant culture and promoted values in character training, their own biases, potential different ways to approach character training, and possibly hidden connotations for different learners. Reflection also symbolizes a point of departure, which means that an instructional designer can step out of the default way of viewing the givens of a situation and can step outside and take a critical look at the work that has been done or the way things have always been done within an organization.

According to Luppicini (2003), an instructional designer should reflect on "the design processes and products, the design situation, and the implication of self and others in the design" (p. 78). It is especially important to pose questions such as, "What is the role of others involved?" "What do I think of myself and my role in practice?" and "What do others think about my design work?" This reflective process can help an instructional designer to become aware of different ways of thinking about the design and in situations where implicit knowledge is embedded in the particularity of the social context. (Luppicini, 2003).

Conclusion

This chapter provided a brief overview of ethical dilemmas encountered by instructional designers within the context of organizational constraints and mandates, instructional designers' own inherent ethical values and cultural stance, as well as learner needs. The issues that arise from this intersectionality become even more visible in character education design, which in itself is a highly subjective area. As a potential framework to reconsider some of the dilemmas, the character-infused decision-making approach based on virtue ethics proposed by Nguyen and Crossan (2021) was presented in this paper. Instructional designers' own character traits and approaches to virtues based on the main constructs of virtue ethics (awareness, judgment, intention and behavior, reflection) were discussed in the context of some of the dilemmas faced by instructional designers. It could be concluded that perhaps what is most needed is for the instructional designer to pursue excellence in the character trait of wisdom, i.e., the ability to discern the right actions in any given situation (Athanassoulis, 2018). Although the ethical dilemmas will always remain

and cultural differences can exacerbate dilemmas, wisdom and an approach based on virtue ethics can guide instructional designers in their design process.

References

Arbuckle, G. A., & ProQuest Ebooks. (2013). *Catholic identity or identities?: Refounding ministries in chaotic times*. Liturgical Press.

Association for Educational Communications and Technology. (2018). *AECT code of professional ethics 2018*. Retrieved from: https://www.aect.org/docs/AECT_Code_of_Ethic-Current.pdf

Athanassoulis, N. (2018). Acquiring Aristotelian virtue. In N. E. Snow (Ed.), *The Oxford handbook of virtue* (pp. 415–431). Oxford University Press.

Baker, F. (2019). Values, virtues, and Catholic identity. *Australasian Catholic Record, 96*(1), 3–13.

Berkowitz, M. W., Lickona, T., Nast, T., Schaeffer, E., & Bohlin, K. (2020). The eleven principles of effective character education: A brief history. *Journal of Research on Character Education, 16*(2), 1–10.

Blakeley, K., & Higgs, M. (2014). Responsible leadership development: Crucible experiences and power relationships in a global professional services firm. *Human Resource Development International, 17*(5), 560–576. https://doi.org/10.1080/13678868.2014.954192

Campbell, K., & Schwier, R. A. (2014). Major movements in instructional design. In O. Zawacki-Richter & T. Anderson (Eds.), *Online distance education: Towards a research agenda* (pp. 345–380). A.U. Press. https://doi.org/10.15215/aupress/9781927356623.01

Cifuentes, L., & Ozel, S. (2006). Resources for attending to the needs of multicultural learners. *Knowledge Quest, 35*(2), 14.

Dam, A., Perera, T., Jones, M., Haughy, M., & Gaeta, T. (2019). The relationship between grit, burnout, and well-being in emergency medicine residents. *AEM Education and Training, 3*(1), 14–19.

Gray, C. M., & Boling, E. (2016). Inscribing ethics and values in designs for learning: A problematic. *Educational Technology Research and Development, 64*(5), 969–1001. https://doi.org/10.1007/s11423-016-9478-x

Gronseth, S. L., Michela, E., & Ugwu, L. O. (2020). Designing for diverse learners. In J. K. McDonald & R. E. West (Eds.), *Design for learning: Principles, processes, and praxis*. EdTech Books. Retrieved from: https://edtechbooks.org/id/designing_for_diverse_learners

Howard, T. C. (2012). Culturally responsive pedagogy. In J. A. Banks (Ed.), *Encyclopedia of diversity in education* (pp. 549–552). SAGE Publications. https://doi.org/10.4135/9781452218533.n174

Hussin, N. H., & Tamuri, A. H. (2019). Embedding values in teaching Islamic education among excellent teachers. *Journal for Multicultural Education, 13*(1), 2–18. https://doi.org/10.1108/JME-07-2017-0040

Jahoda, G. (2012). Critical reflections on some recent definitions of "culture". Sage Publications. https://doi.org/10.1177/1354067X12446229

Johnson, C. S., & Hinton, H., III. (2018). A morality of inclusion: A theoretical argument for culturally consonant character education. *Curriculum and Teaching Dialogue, 20*(1–2), 73–178.

Kress, J. S., & Rotstein, E. (2018). Promoting social, emotional, and spiritual learning in congregational, and day schools. *Journal of Jewish Education, 84*(3), 266–283. https://doi.org/10.1080/15244113.2018.14785309

Kumi-Yeboah, A. (2018). Designing a cross-cultural collaborative online learning framework for online instructors. *Online Learning, 22*(4), 181–201. https://doi.org/10.24059/olj.v22i4.1520

Kwantes, C. T., & Glazer, S. (2017). Culture, organizations, and work. *Springer.* https://doi.org/10.1007/978-3-319-47662-9_4

Labosier, B., & Labosier, J. (2018). A thirty-year experiment in teaching spiritual formation: Twelve lessons we learned. *Journal of Spiritual Formation and Soul Care, 11*(2), 125–140. https://doi.org/10.1177/1939790918795634

Lepeley, M. T. (2021). The human centered sustainable quality culture in organizations. In M. T. Lepeley, O. Morales, P. Essens, N. J. Beutell, & N. Majluf (Eds.), *Human centered organizational culture: Global dimensions* (pp. 3–22). Taylor & Francis.

Lerner, R. M. (2018). Character development among youth: Linking lives in time and place. *International Journal of Behavioral Development, 42*(2), 267–277. https://doi.org/10.1177/0165025417711057

Luppicini, R. (2003). Reflective action instructional design (RAID): A designer's aid. *International Journal of Technology and Design Education, 13*(1), 75–82.

McKay, D. W. (2013). Inculcating core values through application of the patient CaringTouch system. *U.S. Army Medical Department Journal, 8*(1), 36–41.

Messitidis, L. (2018). *Designing learning environments for cultural inclusivity: Cases studies with three instructional designers and a teacher exploring their practises* [Doctoral dissertation, Concordia University].

Mironenko, I. A., & Sorokin, P. S. (2018). Seeking for the definition of "Culture": Current concerns and their implications. A comment on Gustav Jahoda's article "Critical Reflections on some Recent Definitions of 'Culture'". *Integrative Psychological & Behavioral Science, 52*(2), 331–340. https://doi.org/10.1007/s12124-018-9425-y

Monin, B., & Jordan, A. H. (2009). The dynamic moral self: A social psychological perspective. In *Personality, Identity, and Character: Explorations in Moral Psychology* (pp. 341–354). Cambridge University Press.

Morgan, B., Gulliford, L., & Carr, D. (2015). Educating gratitude: Some conceptual and moral misgivings. *Journal of Moral Education, 44*(1), 97–111. https://doi.org/10.1080/03057240.2014.1002461

Moulin-Stożek, D. (2019). The social construction of character. *Journal for the Theory of Social Behaviour, 49*(1), 24–39. https://doi.org/10.1111/jtsb.12188

Murray, E. D., Schaefer, H. S., Callina, K. S., Powers, J. J., Matthews, M. D., Burkhard, B. M., Ryan, D. M., & Lerner, R. M. (2021). Training character: Character attributes and performance profiles among cadets at the United States Military Academy. *The Journal of Positive Psychology, 16*(2), 207–217. https://doi.org/10.1080/17439760.2019.1689414

Nguyen, B., & Crossan, M. (2021). Character-infused ethical decision making. *Journal of Business Ethics, 178*, 171–191. https://doi.org/10.1007/s10551-021-04790-8

Parrish, P., & Linder-VanBerschot, J. (2010). Cultural dimensions of learning: Addressing the challenges of multicultural instruction. *The International Review of Research in Open and Distributed Learning, 11*(2), 1–19.

Rest, J. R. (1986). *Moral development: Advances in research and theory*. Praeger.

Rogers, P. C., Graham, C. R., & Mayes, C. T. (2007). Cultural competence and instructional design: Exploration research into the delivery of online instruction cross-culturally. *Educational Technology Research and Development, 55*(2), 197–217.

Sison, A. J. G., Ferrero, I., & Redín, D. M. (2020). Some virtue ethics implications from Aristotelian and Confucian perspectives on family and business. *Journal of Business Ethics, 165*(2), 241–254. https://doi.org/10.1007/s10551-019-04307-4

Sohail, A., Anuar, A. M., Arshad, M., & Adeel, A. (2018). Gaining recognition of Islamic spiritual intelligence for organisational sustainability. *International Journal of Ethics and Systems, 34*(1), 70–77. https://doi.org/10.1108/IJOES-01-2017-0003

St. Peters, H. Y., & Short, N. (2018). Cross-cultural service learning as pedagogy for character development in occupational therapy doctoral students. *The Open Journal of Occupational Therapy, 6*(4). https://doi.org/10.15453/2168-6408.1493

Stanford Encyclopedia of Philosophy. (2016). Virtue Ethics. In *Stanford Encyclopedia of Philosophy.* Retrieved August 11, 2021. https://plato.stanford.edu/entries/ethics-virtue/

Thiele, L. P. (2006). *The heart of judgment: Practical wisdom, neuroscience, and narrative*. Cambridge University Press.

Thomas, M. K. (2003). Designers' Dilemmas. *TechTrends, 47*(6), 34–39. https://doi.org/10.1007/BF02763282

Thomas, M., & Marlon Mitchell, R. J. (2002). The third dimension of ADDIE: A cultural embrace. *TechTrends, 46*(2), 40–45.

Cultivating a Mindset for Inclusive Learning Design

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Learning design in its broader meaning encompasses several professional and creative practices used to create, develop, implement, evaluate, and adapt educational resources and technologies to improve learning (Wagner, 2021). Considering that learning design focuses on "learner enablement regardless of where, when, or with whom our design efforts will be taking place" (Wagner, 2021, para. 2), we recognize that making learning design more inclusive requires us to challenge current design approaches and perspectives to address the needs of diverse students.

In designing learning experiences, there are multiple opportunities to create environments, resources, activities, technologies, and strategies to support diverse students. Designing inclusive learning environments means that the instructional choices acknowledge, value, and build upon a rich set of knowledge, skills, backgrounds, interests, and experiences that students bring to the learning environment. When learners' various identities (e.g., gender, linguistic, culture) become the anchors for a learning design, the learning environment consists of a robust system that supports students (Gronseth et al., 2021).

Adopting an approach that prioritizes the connection between learning design[1] and student identities can impact students' success positively. In fact, research

[1] For the purpose of this chapter, and considering that learning design encompasses a broader set of educational practices, we use learning design to refer to the development of online and blended learning experiences rather than instructional design. However, for the role that an individual may have in relation to the educational practices, we use a specific term to differentiate the scope of their roles (e.g., instructor, instructional designer).

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shows the importance of professional development in raising instructor self-awareness of the different social identities that students and instructors themselves have, the challenges in addressing student diversity, and the implications of a fixed-mindset (O'Leary et al., 2020). In this chapter, we present an asset-based approach to raise such awareness in order to help faculty embrace the diversity of their students.

Perspectives on Inclusive Learning Design

A number of approaches have emerged to design inclusive educational environments and address the diversity of students. These approaches include but are not limited to universal design for learning (UDL) and culturally responsive pedagogies (CRP). For instance, designing learning environments to support student uniqueness is the premise of the UDL framework (Dalton et al., 2019; Hall et al., 2012). This framework recognizes the diversity of students' social identities which should be the norm and guide to design an inclusive learning experience (Hall et al., 2012). Research has demonstrated that UDL is an effective approach for designing flexible learning and accessible content (Al-Azawei et al., 2016), and promoting academic and social engagement (Katz, 2013). UDL was initially developed for supporting students with disabilities, but more recent efforts have focused on "plus-one" uses of UDL to go beyond accessibility and extend its use to more broadly address the intersectional nature of learners' identities (Tobin & Behling, 2018).

In the quest to support diverse learners through inclusive learning design, discussions have turned to students' backgrounds (e.g., culture, socio-economic status, sexuality, immigration, and linguistic heritage). These characteristics have often been viewed through a deficit lens—as problems to solve—in the form of language deficits and cultural otherness (Surtees, 2019) rather than from an asset perspective which regards these differences as strengths. Concerns about deficient views in the learning environment have led scholars to connect UDL to CRP, which argue that students from culturally diverse backgrounds must be supported in their learning with content and strategies that reflect that diversity (Gay, 2010). When used together, UDL and CRP go beyond responding to students' diversity of skills and learning preferences; they value and incorporate students' cultural diversity—linguistic, background, and norms (Bass & Lawrence-Riddell, 2020; James, 2018; Kieran & Anderson, 2019). This multidimensional approach supports a shift towards building upon students' potential and capacities.

Students' language and cultural background only partially explain the intersection of identity and positionality informing and motivating all participants in the learning environment. We should turn our attention to instructors and instructional designers who also play a substantial role in learning design. Given that instructors are responsible for instructional choices, it is imperative to support their professional development in inclusive teaching. A body of research has shown that pedagogical training can motivate STEM faculty to adopt teaching practices that foster

equitable and culturally responsive environments, and thus, contributing to student learning success (O'Leary et al., 2020). In addition, developing self-awareness and empathy for students as well as recognizing our own privileges contribute to inclusive pedagogy (Dewsbury & Brame, 2019; Kachani et al., 2020).

While student identity should be built into the learning design, we should also consider the instructors' own positionality and identity: culture, language, gender identity, class, ability status, nationality, etc., and how these may influence their instructional choices. Instructors and instructional designers need to extend the notion of the complexity of our social identities to ourselves. How does the interplay between all of these factors impact instructional choices and influence our own approach to course design? How do we recognize and acknowledge the assets that diverse students bring to the class and leverage those assets to create a truly inclusive learning space? In examining this, we offer a practical guide to go beyond self-awareness and approach self-interrogation grounded in the assumption of student diversity as an asset—an essential prerequisite for fostering a mindset for inclusive design.

Self-Interrogation as a Catalyst for Inclusivity

Creating educational opportunities to counteract educational inequalities requires us to first examine our own beliefs to begin cultivating a mindset that embraces learning design as a quest for social justice. To begin this quest, we must acknowledge the intersectional nature of identity and positionality before attempting to describe student needs. Our own social and cultural identities and perspectives can take a central, yet unconscious, role in designing and teaching blended and online courses. Let's take culture, which is a complex concept, as an example. Many of our values, norms, and behavioral expectations are cultural and unconscious (Hall, 1976). While several frameworks have been used to develop an understanding of culture, these are limited in two ways. First, they make assumptions about particular groups and contexts. For instance, Hofstede's cultural dimensions have serious limitations when used to explain other people's behavior based on their country of origin (Långstedt, 2018). Therefore, using them to understand others is problematic. While we recognize the importance of cultural frameworks to help situate the context for a learning environment, we suggest these frameworks be used to examine one's own culture and not to make generalizations about others; we suggest allowing individuals to describe themselves and their cultures, unbound by popular models.

In thinking about culture and language, therefore, we should use intentional reflection to interrogate our own preconceptions to illuminate our unconscious beliefs about and expectations for normative behaviors such as personal lifestyles, knowledge constructions, and individual values. While self-awareness may help in becoming more cognizant of our own feelings, emotions, and actions, its connection to the introspective "why" appears to be ineffective and may lead to more negative

attitudes (Eurich, 2018). Instead, Eurich proposes to focus on "what" –a question that likely empowers us "to act on our new insights" (para. 26). However, to illuminate our unconscious beliefs, we should look beyond leaping from introspection to actions without critically questioning our own preconceptions. This implies a willingness to examine aspects of ourselves honestly in an effort to reveal how our assumptions influence our course design choices.

Self-interrogation, thus, becomes critical to create welcoming, meaningful, and connected learning experiences for all students, and in particular for students whose cultural and linguistic backgrounds differ from a Western-centric worldview favored and promoted in many academic contexts. Thus, we argue that without an intentional and systematic process to examine differences in expectations, norms, behaviors, and our identities and positionality, we may perceive a violation of classroom norms, punish a student who is operating from a different set of expectations, and see students as holding a deficiency. As instructional designers, we believe it is our responsibility to engage in this process with our instructors, content developers, and colleagues to continuously conduct a self-interrogation process—develop a mindset to scrutinize our norms, behaviors, values, approaches, through questioning our design choices.

Dimensions of an Inclusive Learning Design Mindset

In developing a mindset for inclusive learning design, we ground our approach on a process of self-interrogation on our own expectations and positionality before making decisions around pedagogical choices and instructional materials. In this section, we present our practical guide with four critical aspects of learning design for examination. Those involved in learning design can make use of this guide considering their specific contexts and resources at hand. At the end of this section, see Table 1 for guiding reflective questions.

Interaction and Communication

How do we develop meaningful, mutually-respected, and effective interaction and communication with students? Interaction and communication are critical in all learning modalities, especially in online and blended learning environments, and carry implications for both students and instructors (Roddy et al., 2017). For instructors, these modes of instruction pose challenges related to the kinds of interaction and communication patterns to be integrated into the course. One way to address these challenges is to begin with an acknowledgement that, regardless of the mode of delivery, power dynamics between students and instructors exist (e.g., through grades, assignments, delivery of instruction). Instructors can examine their concerns about interacting with students and the types of interactions that are necessary for

Table 1 Inclusive mindset approach & guiding questions

	Asset-based	Curious	Defining expectations	Flexible
Description & Alignment with Four Critical Aspects of Design[a]	Take an asset-based perspective on student performance (not a deficit perspective).[1, 2, 3]Recognize the cultural capital that each student brings to the course.[1, 2]	Curious, not assuming.[1,2] Curious about students' lives and experiences.[1, 2]	Invite your students to share their expectations.[1, 2, 3, 4]Share your expectations with your students.[1, 2, 3, 4]Define terms and symbols used in the course and your discipline. Understanding the words and symbols in a discipline can increase a sense of belonging to those new to the field.[1, 3]Model proper usage of copyrighted materials (images, texts), including such licensing as Creative Commons.[1, 4]	Flexible but structured.[1]Alternative assessments.[3, 4]Choices with technology.[4]Flexible cost: Open Educational Resources (OERs) are used when possible, with options for a free e-text or purchase of a paper textbook.[4]

(continued)

Table 1 (continued)

	Asset-based	Curious	Defining expectations	Flexible
Guiding Questions	While it is easy to see what skills a student hasn't mastered yet, how well do I acknowledge what a student is doing right?When students have unique experiences that differ from my own, do I automatically see those as potential strengths in the community of learners? What kinds of design choices will show that I value students? Can I see students' linguistic systems as assets and allow for translanguaging? What can I do to better understand why some students are considered deviant from "good" language?How willing am I to interrogate the systems that ask for language that adheres to academic dispositions of each discipline? How much do I know about the multilingual capacities and multiple literacies of students? How can the course design make use of these multiple assets to level the ground for all students in my class?	Do my course materials reflect a global society and diverse contexts and perspectives, or do the course materials mainly focus on the context of my own society or community? What assumptions about cultural background knowledge or shared value systems do the images in the course reveal? Do I invite students to connect the course content to their own lives and prior knowledge? What labels are used to describe student backgrounds (gender, cultural heritage, national origin, linguistic background, etc.), and are these labels chosen by the students themselves, or were the labels imposed on them?How does my own identity and positionality affect my design choices? Can the cultural and linguistic assets of students be weaved in their assignments? Are assessments relatable for a diverse range of students? What knowledge are we assessing, and what kind of knowledge is valuable to students? Have I checked to see if there are regions of the world where a tool I am requiring is not available due to censorship or other reasons?	Am I assessing a student's use of a prestige dialect (Academic English, for example) without explicitly teaching those skills, and how does that uphold systems of oppression? Is mastering a prestige dialect part of the learning outcomes of this course? Do I realize that ideas about what intellectual property is and what can be owned, bought and sold, can vary within a culture and across cultures? In what ways do I model my expectations around usage of copyrighted images and texts in my course? In what ways do I specify these expectations to students? In what ways do I impose my own cultural expectations on others?Do I assume students are familiar with the technology used in this course? How do I see interaction and communication in the context of group work? How is knowledge gained and evaluated in my discipline? Is there room for innovation and challenging the norm? What assumptions about background knowledge, literacy/academic skills, and digital skills guide the complexity of our assignments? If the use of digital tools is critical for learning and assessments, what kinds of information do these tools require me and students to share? How are these tools monetizing learning as opposed to advancing it?	Do I invite students to voice feedback to me only, or do I also facilitate alternate routes for students to form communities with whom they feel comfortable sharing their voice? Do I provide multiple ways for students to demonstrate their mastery? How do I respond to students who want to opt out of a technology item out of privacy concerns? Do I encourage students to use all of their linguistic resources (rather than English only) during the writing process? How willing am I to listen to students about the ways they would like to be evaluated? Even further, can students be co-designers of assessments? Do the assessments offer flexibility and choice that empowers students and enhances the learning experience? Does the flexibility I offer exist within a sound and thoughtfully designed course structure?

[a](1) Interaction and Communication, (2) Representation, (3) Assessments, (4) Technology for Ethical Design

knowledge construction within the discipline. When designing participation and interaction guidelines or crafting feedback, we should consider that both the content of feedback and the method of delivery impact students' sense of self-efficacy and beliefs (Hyland, 2013). For communication in particular, be aware of the multiple formats available (e.g., audio, video, text). These various modalities afford unique features that can enhance or misrepresent meaning. For instance, emphasis on written communication in online environments further increases the potential for misinterpretations of intended meaning. However, by responding to student work through multiple means (e.g., eliciting anonymous student feedback), we can alleviate issues related to power distance perceptions (Milheim, 2017).

Representation

What is the value and the impact of content and language representation on students' learning experience? Student perception of a lack of multicultural content in a course directly affects their participation and learning (Liu et al., 2010). Instructors and instructional designers can increase multicultural representation by critically questioning materials choices, thereby revealing whether the content presents a diversity of contexts and perspectives or whether the visual representations make assumptions about certain groups of people. We cannot assume that all students will evaluate the significance of the content and images through the same lens.

Linguistic representation is also key. In taking a self-reflective stance, designers of learning experiences should problematize the contextual and societal circumstances in which students from language-minority communities are marginalized. If we fail to ask ourselves hard questions about hierarchical systems that privilege those with dominant academic discourses, we fail students whose academic discourses are varied and shaped by their linguistic and cultural identities. An important goal in seeking social justice in education is to shift the deficiency-based perspective ascribed to multilingual students and multidialectal students whose language practices are considered problematic and in need of being fixed (Flores, 2021). Rather, we can capitalize on the linguistic diversity of our students by encouraging the use of all linguistic resources at their disposal. One strategy to achieve this is through translanguaging (Garcia & Wei, 2014), which invites students to manage certain academic content in their first language or with a combination of languages. Combining two or more languages to express an idea in a more meaningful way, using a second language for confirmation checks, or sharing relevant words in another language that may not have an equivalent in the course language are all examples of this approach (Hamman et al., 2018). Another example of this is allowing students to create journal entries or word maps in any language or combination of languages, if they so choose. Students could also be encouraged to take a global perspective and explore the publications of scholars whose works are in a language other than English if it is one that the student also speaks. The purpose of this linguistic flexibility is to facilitate a deeper level of cognitive engagement

and understanding of the subject matter (Garcia & Wei, 2014, p. 64), rather than a primary focus on polishing academic English usage if that is not a course learning outcome.

Assessments

How do our own experiences lead us to design assessments that reveal specific biases? Understanding our own biases is necessary for taking the next step of using formative and summative evaluations to validate and value the content knowledge and experiences of our students—all while offering flexibility and choice (Burge, 2011), and making the evaluations more relatable for a diverse range of students (Montenegro & Jankowski, 2017). An inclusive-relevant assessment can "lead and front students' cultural strengths and curiosities and nurture and extend literacies" (Gibson, 2020). While educational systems force us to report grades as equivalents to measures of learning, we can challenge ourselves to include participatory practices for students to choose the ways in which they would like to be evaluated.

Welcoming students' social, personal, and cultural histories in assessments can enrich learning and generate creativity. Reflecting on approaches to bring students' "funds of knowledge" into assessments can help us understand "cultural–historical basis of household life and other formative experiences" (Moll, 2019, p. 137) and generate pedagogical innovations. We can also reflect on the standards included in student assessments, such as language and conventions, thereby questioning our assumptions about the impact of the academic discourse required in the assessments. For writing assessments in particular, Inoue (2015) argues that assessing writing involves far more than the format and grading rubric, and should be a way to cultivate and nurture "complex systems that are centrally about sustaining fairness and diverse complexity" (p. 12)—calling attention to the ecology involved in these types of assessments. This ecology encompasses the dominant discourse of the writing prompt, the normative judgment explanations in rubrics, writers' sociocultural constructed experiences and references, readers' relation to writers' contexts, applicability of the prompt beyond abstract ideas, racial projections, and expectations made on writers' abilities, among others.

Technology for Ethical Design

What technologies do we take for granted? Technology is not neutral and will never be. The choices we make reflect our experiences with and assumptions of the uses of technology. Ethical concerns about the educational uses of digital tools have recently surfaced (Krutka et al., 2020), urging us to critically examine the ways in which we integrate these tools into learning. Self-interrogation unveils our

assumptions and biases related to student access and digital literacy, expectations of use, and level of comfort with sharing information via these tools.

Digital tools have revolutionized teaching and learning, yet they can also promote disconnected learning. By reflecting on our own use and knowledge of technologies, we can question the complex sociotechnical designs that favor access, communication, and interaction for some tools, while limiting others (van Dijk, 2020). We can examine issues related to the extent to which the tools help students accomplish their own goals, the kinds of information these tools require us and students to share, and the implications of the effects of monetizing learning that many tools engender. If technology innovations promise radical changes in educational experiences and society at large, these should truly embrace cultural diversity (Getto & Sun, 2017). Similarly, we should question the kinds of access (or lack thereof) that some technologies promote in different geographical areas, where socio-political context may prevent students from using all technologies required for a class (e.g., Google apps).

Moving Toward an Inclusive Mindset through Self-interrogation

Our approach for an inclusive mindset involves a practical guide for a self-interrogation process that derives from theoretical as well as practice-based perspectives, including UDL, Translanguaging, Culturally Responsive Teaching, Antiracist Writing Assessment Ecologies, Flexible Pedagogy, and ethical uses of technology. The process includes four broader themes and their corresponding self-interrogation strands, based on the four critical components, grouped into *Asset-based, Curious, Defining Expectations*, and *Flexible* (Table 1). To engage in this process, we encourage you to explore the guiding questions at whichever point you would like to start. Depending on your interest and what you deem helpful and relevant to you personally, you might explore all questions or a select few. Note that the use of this process will vary depending on the characteristics of your specific context, including available time and degree of support from an instructional design team. For this reason, we intend this to be a flexible and adaptable process.

Conclusion

Cultivating a mindset for inclusive learning design matters at all levels of an educational experience. Without first reflecting on who we are as individuals and how our context (e.g., socio-political, educational, cultural) and experiences shape us, we may fail to design learning environments that value the true diversity of students' traits and assets. As we uncover our own preferences and expectations, we become

more able to recognize a greater range of perspectives. Designing learning experiences without considering cultural and linguistic aspects as integral elements of the design process can undermine the goals of instructors and learning designers who see students' cultures, languages, and backgrounds as valuable resources. With this knowledge, we are able to see students through an asset-based perspective, which transforms the learning experience for students from diverse backgrounds into one in which all students are welcomed and valued.

References

Al-Azawei, A., Serenelli, F., & Lundqvist, K. (2016). Universal design for learning (UDL): A content analysis of peer-reviewed journal papers from 2012 to 2015. *Journal of the Scholarship of Teaching and Learning, 16*(3), 39–56. https://doi.org/10.14434/josotl.v16i3.19295

Bass, G., & Lawrence-Riddell, M. (2020, January 13). UDL and 21st century learning. *Faculty Focus*. https://www.facultyfocus.com/articles/blended-flipped-learning/universal-design-for-learning-2/

Burge, E. (2011). Introduction: Why look at flexibility? In E. Burge, C. Gibson, & T. Gibson (Eds.), *Flexible pedagogy, flexible practice: Notes from the trenches of distance education* (pp. 1–16). Athabasca University Press.

Dalton, E. M., Lyner-Cleophas, M., Ferguson, B. T., & McKenzie, J. (2019). Inclusion, universal design and universal design for learning in higher education: South Africa and the United States. *African Journal of Disability, 8*, 519. https://doi.org/10.4102/ajod.v8i0.519

Dewsbury, B., & Brame, C. J. (2019). Inclusive teaching. *CBE—Life Sciences Education, 18*(2), fe2. https://doi.org/10.1187/cbe.19-01-0021

Eurich, T. (2018, January 4). What self-awareness really is (and how to cultivate it). *Harvard Business Review*. https://hbr.org/2018/01/what-self-awareness-really-is-and-how-to-cultivate-it

Flores, F. (2021, January 20). *Understanding Translanguaging as political act* [Video]. YouTube. https://www.youtube.com/watch?v=whKClO9JnHQ

Garcia, O., & Wei, L. (2014). *Translanguaging: Language, bilingualism, and education*. Palgrave Macmillan.

Gay, G. (2010). *Culturally responsive teaching: Theory research and practice* (2nd ed.). Teachers College.

Getto, G., & Sun, H. (2017). Localizing user experience: Strategies, practices, and techniques for culturally sensitive design. *Technical Communication, 64*(2), 89–94.

Gibson, V. (2020, February 26). *Working toward culturally responsive assessment practices*. National Council of Teachers of English. https://ncte.org/blog/2020/02/working-toward-culturally-responsive-assessment-practices

Gronseth, S. L., Michela, E., & Ugwu, L. O. (2021). Designing for diverse learners. In J. McDonald & R. West (Eds.), *Design for learning: Principles, processes, and praxis*. Libretexts.

Hall, E. (1976). *Beyond culture* (1st ed.). Anchor Press.

Hall, T. E., Meyer, A., & Rose, D. H. (Eds.). (2012). *Universal design for learning in the classroom: Practical applications*. Guilford Press.

Hamman, L., Beck, E., & Donaldson, A. (2018, September 10). A pedagogy of translanguaging. *Language Magazine*. https://www.languagemagazine.com/2018/09/10/a-pedagogy-of-translanguagin

Hyland, K. (2013). Faculty feedback: Perceptions and practices in L2 disciplinary writing. *Journal of Second Language Writing, 22*(3), 240–253. https://doi.org/10.1016/j.jslw.2013.03.003

Inoue, A. B. (2015). *Antiracist writing assessment ecologies: Teaching and assessing writing for a socially just future*. The WAC Clearinghouse. https://doi.org/10.37514/PER-B.2015.0698.

James, N. (2018). Using narrative inquiry to explore the experience of one ethnically diverse ESL nursing student. *Teaching and Learning in Nursing, 13*(1), 35–40. https://doi.org/10.1016/j.teln.2017.08.002

Kachani, S., Ross, C., & Irvin, A. (2020). 5 Principles as pathways to inclusive teaching. *Inside Higher Ed*. https://www.insidehighered.com/advice/2020/02/19/practical-steps-toward-more-inclusive-teaching-opinion

Katz, J. (2013). The Three Block Model of Universal Design for Learning (UDL): Engaging students in inclusive education. *Canadian Journal of Education, 36*(1), 153–194. https://www.jstor.org/stable/10.2307/canajeducrevucan.36.1.153

Kieran, L., & Anderson, C. (2019). Connecting Universal Design for Learning with culturally responsive teaching. *Education and Urban Society, 51*(9), 1202–1216. https://doi.org/10.1177/0013124518785012

Krutka, D. G., Heath, M. K., & Mason, L. E. (2020). Technology won't save us: A call for technoskepticism in social studies. *Contemporary Issues in Technology and Teacher Education, 20*(1), 108–120. https://www.learntechlib.org/primary/p/216737/

Långstedt, J. (2018). Culture, an excuse? A critical analysis of essentialist assumptions in cross-cultural management research and practice. *International Journal of Cross-Cultural Management, 18*(3), 293–308. https://doi.org/10.1177/1470595818793449

Liu, X., Liu, S., Lee, S. H., & Magjuka, R. J. (2010). Cultural differences in online learning: International student perceptions. *Journal of Educational Technology & Society, 13*(3), 177–188. https://www.jstor.org/stable/jeductechsoci.13.3.177

Milheim, K. (2017). A fundamental look at cultural diversity and the online classroom. *eLearn Magazine*. https://elearnmag.acm.org/archive.cfm?aid=3041614

Moll, L. C. (2019). Elaborating funds of knowledge: Community-oriented practices in international contexts. *Literacy Research: Theory, Method, and Practice, 68*(1), 130–138. https://doi.org/10.1177/2381336919870805

Montenegro, E., & Jankowski, N. A. (2017). Equity and assessment: Moving towards culturally responsive assessment. *Occasional Paper, 29*. https://learningoutcomesassessment.org/wp-content/uploads/2019/02/OccasionalPaper29.pdf

O'Leary, E. S., Shapiro, C., Toma, S., Sayson, H. W., Levis-Fitzgerald, M., Johnson, T., & Sork, V. L. (2020). Creating inclusive classrooms by engaging STEM faculty in culturally responsive teaching workshops. *International Journal of STEM Education, 7*(1), 1–15. https://doi.org/10.1186/s40594-020-00230-7

Roddy, C., Amiet, D. L., Chung, J., Holt, C., Shaw, L., McKenzie, S., et al. (2017). Applying best practice online learning, teaching, and support to intensive online environments: An integrative review. *Frontiers in Education, 2*, 59. https://www.frontiersin.org/articles/10.3389/feduc.2017.00059/full

Surtees, V. (2019). Challenging deficit constructions of the international student category in Canadian higher education. *TESL Canada Journal, 36*(1), 48–70. https://doi.org/10.18806/tesl.v36i1.1302

Tobin, T. J., & Behling, K. T. (2018). *Reach everyone, teach everyone: Universal design for learning in higher education*. West Virginia University Press.

van Dijk, J. (2020). *The digital divide*. John Wiley & Sons. https://www.wiley.com/en-us/The+Digital+Divide-p-9781509534456

Wagner, E. D. (2021). Becoming a learning designer. In J. K. McDonald & R. E. West (Eds.), *Design for learning: Principles, processes, and praxis* (1st ed.). BYU Open Textbook Network. https://open.byu.edu/id/learning_designer

Emotional Pathway of Becoming a Professional: Stories of Graduate Students and Recommendations for Academia

Iryna Ashby, Suzhen Duan, Carolina Cuesta, Brantly McCord, Shivani Ramoutar, Mohan Yang, Ryan Wynkoop, Wanju Huang, and Marisa Exter

"Lives do not serve as models; only stories do that" (Heilbrun, 1988, p. 37). If there is no story or narrative, it is like we do not exist (Polkinghorne, 1988). Our lives are woven with small and major life events that create a seamless, yet often overwhelmingly complex web of our experiences and individual growth. To make sense of such complexity, it is important to negotiate individual experiences through storytelling and thus organize them into more meaningful units to help ourselves and others understand and learn from (Moen, 2006; Zellermayer, 1997). White (1987) describes a narrative as a meta-code that helps us share transcultural and cross-disciplinary experiences. This is particularly true for topics like attending a graduate school, where peer-reviewed and white-paper publications tend to focus on more abstract topics, like professional formation and developing research identity, while overlooking the emotional burden brought by the mere fact of being in a graduate school, "a rollercoaster of confidence and emotion" as described by Christie et al. (2008, p. 225). At any given time, a graduate student may experience and fail to successfully cope with many if not all of these:

- Adapting to a new country to enculturating into a disciplinary culture,
- Pressure of generating research and succeeding,
- Having to split attention across family, studies, research, and work,

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- Feeling stressed because of the constant lack of time to do everything, and many more (Bothello & Roulet, 2019; Knox et al., 2013; Poyrazli & Kavanaugh, 2006; Tomlinson, 2007; Zhang et al., 2011).

The focus of this descriptive chapter is to explore individual narratives on emotional aspects of the lives of graduate student co-authors, including students of different genders, backgrounds, disciplines, and standing, united by their interest in instructional design (ID), visual design, and teaching as a career, and participating in a research family led by two ID faculty in the College of Education at Purdue University. Our stories illuminate multifaceted challenges, expectations, and pressures faced daily by graduate students. These narratives will reflect the issues of equity and community experienced by new researchers and professionals entering the field. Our goal is not to complete in-depth phenomenological research, but rather share the diversity of experiences and to promote the need of a deeper inquiry into individual student experiences!

All co-authors are part of a "research family" (https://disruptive.education.purdue.edu), a community formed by the students and faculty to discuss topics related to self-care, professional growth, and becoming a researcher, as well as more traditional topics (manuscript in progress). Before you put this chapter aside thinking that stories that did not go through the rigor of research inquiry may be too "soft" or "weak" and not reflective of the accepted perception of what it means to prepare oneself for the life of a faculty member or researcher, remember that those perceptions are the status quo we would like to question. A graduate program should be a place where we learn not only about the field of interest, but also offer the psychological safety to question existing boundaries of the field, notion of the profession, and professionalism itself (namely, such safety aspects as inclusion, learner, contributor, and challenger; see Clark, 2020, for more information). These vignettes were challenging because we felt that we exposed our inner selves that may be perceived as a weakness for a future researcher. But is it? After all these inner workings are what have given us the strength to continue.

Personal Stories

Meeting Your Own—High—Expectations: Brantly (He/Him/His/They/Them/Their/She/Her/Hers), Game Development Instructor, Work Wellness Advocate, Ph.D. 1st Year, White American

Good work grows more work. That is the discovery that I and our group made when discussing our work-life balance. Routinely, we lament our overcommitments, struggling to break away from work. As a TA, to improve my students' qualities of life—agency, literacy, and societal compatibility—I seize context and engage with

others. Yet, my quantity of work frequently feels out of my control. When academic institutions expand in response to quantitative success (funding, enrollment, job placement), but fail to account for the educators' labor in substantiating success, educators bear the growing pains.

In my first of five years as a co-instructor, our students outnumbered available lab computers, which wasn't the case when I took the class in undergrad. The course grew in popularity and enrollment without additional resources being allocated. The cost was laid on instructors to redesign the course from the bottom up, so I sacrificed summertime to develop content unpaid. Here, automated registration systems and an administrative lack of context-sensitive supervision required educators to flex under a generalized, hands-off plan. Though I want to produce quality experiences, my work-life balance is often neglected—excluded from the equation. If the function asks for my X = 1 to produce Y = 2, I must reject its logic.

My Expectations and Other's Expectations: Wanju (She/Her/Hers), Faculty, Instructional Designer, Former Special Education Teacher in Taiwan, Taiwanese

My advisor once told me: "A Master's is a destination. The Ph.D. is a journey." What does that mean? I thought I would only need five years to earn a Ph.D. That's what they said at the doctoral student orientation: "We would like to see you here for five years." In retrospect, I think I deliberately chose to only remember "five years." In my head, I said to myself, "I am willing to invest five years of my life in exchange for a Ph.D." Only when my peers started dropping out of the program did I realize how wrong I was. What made things worse was when my mother asked, "Why is this taking so long?" and followed with a comment – "You really don't want to have a degree that was good when you started but could be useless by the time you finish." I didn't know what to say. I knew she didn't mean it in a bad way, and she was proud of me. However, it was hard to accept the possibility that I may not be able to earn a doctoral degree. Then, I shared what my advisor said with her. It is a journey. It takes time to figure out what one is truly passionate about and willing to spend years exploring to create new knowledge.

Now, when I reflect on that conversation with my mother, I realize it was more beneficial to me than to her. I was trying to convince myself that I could do it – I could earn a Ph.D. So, it might be difficult to help others to understand what we do and why it takes so long to complete a doctoral degree. It is even more difficult to do so if we cannot convince ourselves that what we are doing is valuable and meaningful. So, from time to time, we need to remind ourselves of the reasons why we chose to enter a doctoral program and take pride in what we have accomplished. And always remember, earning a doctoral degree is a journey.

Having Kids While in Graduate School: Suzhen (She/Her/Hers), Chinese, Project Manager, Ph.D. Student in Learning Design and Technology, Mother

I decided to pursue a Ph.D. in the US after working in the industry for more than ten years in China. After struggling for so many years on the life-work balance while working full-time intensively in a highly competitive environment, I thought this decision meant I would have more free time with my kids.

Yet, once I got here, I gradually began to realize that it was not as I expected. There are many challenges, including language, culture shock, and all the issues about living in a new place. I needed to deal with not only my learning tasks but also all my kids' school-related stuff. Even though my English was limited, mine was the best in my family. So, I had to be involved in all the things that my family was facing. As time went by and some routines were set or transferred to my husband, I focused more on my research because I thought it was the most important thing for my target career as a faculty member. At this stage, I also found out that I could not play freely with my kids because I felt full of research ideas constantly running through my head that would not stop even when I was outside with my kids. Also, I was easily distracted by them when I focused on my writing, so it took me more time to concentrate. Especially during the pandemic, my two kids and I were isolated at home, taking online courses together. Even though we were together physically, I felt I spent much less time mentally with them because I am in the third year of my Ph.D. and hope to be productive in my research. I tried some strategies, such as working when they were sleeping, setting time staying with them, etc. But this struggle is always with me. As a mother who is also a full-time Ph.D. student, there are too many conflicts between these two roles.

Maybe there is no life-work balance at all. Or, we can say that there is not perfect. It is a dynamic process to prioritize things in our life, choosing important stuff for us currently and dedicating time to them. The most important thing is to stop feeling guilty after making the decision!

Pursuing Ph.D. While Working Full-Time: Ryan (He/Him/His), Full-Time Instructional Designer and Part-Time Ph.D. Student in Learning Design and Technology at the Same Institution, American

Working full-time while pursuing a Ph.D. part-time has advantages. Aside from the tuition discount for employees, the program is related to my job, which provides efficient crossover between work and school. I can immediately use new knowledge and skills at work. The new skills I have gained have improved the quality of my work.

Time management is a delicate balance as a full-time employee and part-time student. I've been working full-time for ten years and understand the importance of work-life balance. Adding in school part-time on top of family, friends, work, and community involvement has caused me to make better use of my time. My family and friends understand that I want to pursue a Ph.D. and it makes it easier for me to say no to doing some things because they understand why.

The hardest part about this arrangement is that some days after working eight or nine hours, the thought of staring at a computer screen at night is almost unbearable. Weeks with heavy coursework require careful planning to reduce screen time. The ability to gain experience teaching a class or being actively involved in student organizations and activities is difficult. Even interacting with classmates and getting to know them can be difficult. Sometimes, I feel like I'm missing out on the full experience. But everyone's journey through graduate school is different, and I will find the path that best works for me.

A Perspective of an International Student: Shivani (She/Her/Hers), PhD Student in Learning Design and Technology Program, Trinidadian, Enthusiast of Caribbean Culture

As an international student, the experience of studying away from home and my family was entirely new for me. While it is exciting, the community of international students has unique challenges that extend beyond difficulties of navigating an unfamiliar landscape, language, or culture. Oftentimes, we question ourselves and our identities when being away from all the people, places, and activities that make them who they are. I am from Trinidad and Tobago, where you can actually feel the warmth (both literally and metaphorically) of an island culture where everyone seems to know each other! I miss that feeling of connection to a space and community, because back home, community is a balm, a cushion, and an integral part of our identities. We know our neighbors, everyone knows each other and greets each other, and we meet a new "aunty" or "uncle" every day, which are community elders who we give this title to even though we may not be related! I had to realize that these types of connections and communities take time to build in a new space, and it all feels a bit like "starting over" in life.

Personally, I think there is a lot of strength that you get from having trust and familiar support systems, or people who just understand you. At Purdue, I am able to have a research family, advisors, peers, and mentors who meet and talk not only about research, academia, grants, and job preparation but also about family, mental health, food, and plants. I think just being able to talk about things that are important to each of us is crucial in filling an unfamiliar landscape.

Back home, I find a lot of comfort in cultural connections and visiting places of worship where I can feel grounded spiritually and hear traditional music and songs. I often revisit these things by keeping connected through social media or music apps

or looking at the photos I've compiled over the years and speaking to my family about our shared experiences. I think in a new land, international students are tasked with carving out a little space for ourselves and filling it with those things which make us happy – our music, food, and connections to family through memoirs, photographs, or technology. What makes me the happiest, though, is sharing my culture and who I am with new people. My department and peers have all been exposed to Trinidad and Tobago in some form or fashion, through poetry, photographs, music, food, or small trinkets!

Keeping My Reasons to Pursue a Ph.D. Near Me: Carolina (She/Her/Hers), PhD Student (Learning Design and Technology Program), Wonderer, Finding a Purpose, Originally from Colombia

I have been an adjunct lecturer for five years now; this was the main reason for pursuing a Ph.D. My area of expertise is entrepreneurship and innovation, not education. So, I decided that if I wanted to engage better with my students, motivate and understand them, I needed to know how humans learn and the best ways to do it. But this road has not been easy. I had to leave my job, my country, family, and friends. And I always think that it is for the greater good, that is, to impact the future of education in my country. Saying this to myself somehow comforts me and helps me get out of bed most days. However, the most challenging aspect that I have faced in this journey is the infamous imposter syndrome. Writing in another language and finding the right word to express my ideas, thoughts, feelings, and disagreements have been the hardest, complex, and challenging activities in my life. Doubting my critical and analytical skills has brought, at times, a gloomy and dark shadow to my always busy mind. But the key here, in all this complexity, is something simple. Keep your purpose always near, in your thoughts, notes, and actions. Even in the sticky notes we are so used to now, write it down and look at it once a day, share it with your research team, your advisor, your friends (new friends), and when you feel that is no way to go, they will remind you why are you there, and help you get back on track.

Struggling with Mental Health: Marisa (She/Her/Hers), Associate Professor & Mommy

After working in industry for seven years, I believed pursuing a doctorate full-time would provide me the opportunity for a healthier work-life balance, which would automatically decrease the depression and anxiety I had struggled with since my teens. As most everyone who has been through a doctoral program knows, this was

not a particularly realistic expectation. I struggled with imposter syndrome, fear of failure, concern about finances, worry that my skills would become outdated and prevent me from returning to industry if necessary, and dealing with the types of social situations which often can be difficult for me. An early miscarriage followed by several years of difficulty conceiving during my early 30s led to increased anxiety about running out of time for important life milestones. Several professors helpfully advised, "If you think it's hard now, just wait until you are a faculty member," further driving my anxiety about the future. Fortunately for me, my doctoral adviser could not have been more understanding or supportive.

Two kids and most of a decade after I started, I earned my PhD. I'm not really sure where I would be right now without my advisor, peers, very supportive husband, and not exactly supportive, but fairly cuddly, kids and pets. I also do not know where I would be without adequate mental health coverage and care. For all these reasons, I know it is necessary but not sufficient for me to be there for "my" graduate students.

Imposter Syndrome or Stay True to Yourself: Iryna (She/Her/Hers), Doctoral Candidate, Instructional Designer, Lifelong Learner, Originally from Ukraine

"I know that I know nothing" (Socrates) has been my motto throughout the years of studying and multiple degrees. To me, this has always meant opportunities to continue growing both personally and professionally. It has also kept me humble, yet excited about new discoveries that waited for me in the future. Growing up in Ukraine, I believed that a person holding a doctorate degree should have comprehensive and diverse knowledge that goes well beyond their area of immediate expertise. Thus, from my first year as a PhD student, I constantly compared myself against an "ideal professional," and realized that there was still so much to learn. The feeling of wonderment was exhilarating! Yet, somehow half the way, this excitement from learning turned into constant questioning my knowledge and experience and whether I know enough, can give the right answer, or can be perceived as a professional in my field. In trying to bring back the feeling of elation, I wanted to do more, test myself, extend my own boundaries, which translated into multiple research projects, competitions, grants, enrolling in courses from a range of programs, co-designing and co-teaching courses, presenting at conferences, and many more, without having an opportunity to actually stop and enjoy what I accomplished. I could not accept praise as I did not feel I deserved it and tried to work even harder to justify it. My original curiosity turned into significant anxieties and then… the feeling of emptiness appeared despite a multi-page CV. Having a support network within the disciplinary program, where I felt safe to not always be strong, hold back, and share concerns has been one of the most important experiences. Talking to peers and faculty at our research family meetings helped me see that I am

not alone when facing these challenges and gave me strength to continue with my path. Working on this chapter demonstrated even further that while different, we have a lot in common, which helped us further gain empathy towards each other, our students, and others we work with.

Be Aware of the Benefits and Tradeoffs: Mohan (He/Him/His), Assistant Professor, New Dad, Originally from Mainland China

It has been over a month since I graduated and started my current position (a different field from my doctoral program). Looking back, there were moments of both struggle and excitement. I entered my doctoral program with a goal of becoming a professor after hearing about its flexibility and work-life balance. However, doubts of the choice, concerns over the future, and pressure being around productive peers were some of the main themes throughout my doctoral program. In Chinese culture, a person should establish himself or herself in the society by the age of 30. I knew I would turn 30 upon graduation but I was uncertain whether I could establish myself, which seems to be a normal concern but did cause lots of anxiety due to personal pressures (e.g., getting married, having a kid, and supporting my little family). There were tradeoffs in choosing to spend the most important five years of my life pursuing a PhD degree. The benefits went beyond a degree. Being aware of the benefits and tradeoffs would have greatly prepared me mentally.

I was taught no pains, no gains (literal translation in Chinese: plum blossom's fragrance comes from the bitter cold) when I was young while no one told me to enjoy the beauty of snow in the bitter cold. The pitfall of such a motivational motto is leading people to overlook one's pains, and even the gains. There were so many gains that I didn't realize until later in my program. For example, I've met people within and outside my program who I can collaborate with throughout my professional life. I have made lifetime friends who share similar passion and vision. I've developed research skills to become an independent researcher and able to focus on topics related to urgent educational issues. The incapability of recognizing such benefits directed my focus on the costs of spending the precious five years, which gave me some hard times. Yet, the costs are seldom openly discussed in the academic community, not just in my program, as if everyone else is so dedicated to research without considering the tradeoffs, and so should I. The tremendous time I needed to invest in research and other work with English as my second language blurred my work-life boundary, leaving limited time for self and family. Following that is the cost of mental health and sometimes physical health. I still remember the year I got shingles and continued to attend a week-long conference with little sleep due to non-stop severe pain day and night. My colleagues and I just laughed at it as if it were another normal week for a graduate student. Later I learned it happened to a lot of graduate students. With little time spent with friends and even family, I sometimes struggled with personal emotions and slight depression. During the

program, and probably even very recently, I questioned the value of my past five years, especially after seeing my friends start their businesses and career very early on. I constantly asked myself: "Is a tenure-track position really what I want?" but eventually resisted the temptation of leaving the program for other professional opportunities. I wish there were someone I could have reached out to regarding the unspoken feelings. Hooray to me for making it through, but I know there are some great researchers who decided to choose a different route due to a combination of reasons. I hope both the pains and gains are equally discussed to help graduate students weigh the benefits and tradeoffs, not only to make better decisions, but also to live a productive as well as healthy graduate life.

Reflecting on Our Experiences

In this chapter we explored the richness and nuances of individual experiences that are difficult to express in a non-storytelling way. Bakhtin (1986) views life narratives as an ongoing dialogue with ourselves and our surroundings as we make sense of life events. Such an ongoing dialogue may also create differences between *life experienced* (actual events that happened) and *life told* (or our perception of the events placed within the sociocultural framework and individual insights) (Bruner, 1984). Additionally, your insights drawn from the narrative as a reader may differ from those of a storyteller, as we tend to experience them through the lens of own life and background (Bruner, 1984). Indeed, as Vygotsky (1978) and Bakhtin (1986) argued, life experiences and their interpretation should be viewed as a sociocultural phenomenon that has to be experienced as a whole. Yet, in spite of the differences in our cultural and professional backgrounds, there are several complex trends that could be observed. Our goal is to increase the awareness of the complex combination of challenges faced by our doctoral students. Graduate student, faculty, researcher – all these terms bring up a set of characteristics and expectations – an aggregate image of what it means that we may forget that each student, faculty, researcher has their own story filled with challenges and achievements. Whether you are a faculty member, counselor, graduate office staff, or a future or a current student, we hope that these reflections showed how different our individualities are, which cannot and should not be just an aggregate.

Graduate school is a major life event, but also a set of strong stressors, including academic and research responsibilities and pressures, finances and debt, anxiety, poor work-life balance, burnout, as well as mental and physical health issues that result from such stressors (El-Ghoroury et al., 2012). Our narratives reflected these key stressors with the added narrative to explore and explain how we try to cope with them. As a group, we have been moving towards a "research family" model which we believe is more beneficial to our students than a traditional research group, because it takes a holistic view of students, providing a safe space to share personal life and emotional reactions as well as academic concerns. Yet, if social support and coping strategies are lacking or ineffective, the impact of these stressors can become

overwhelming (Berry, 2006). Furthermore, the issues are compounded by the need to acculturate to a different culture, whether it is a different nation or even a different field/discipline.

Both the faculty and student co-authors of this chapter have been reflecting individually and jointly on these topics for the past year, in part through purposeful engagement during weekly meetings and through writing blog posts as well as working on this chapter. We have come to recognize that students cannot always nor should do this on their own, but that the university should take responsibility for ensuring that all students can succeed. This requires gaining better understanding of the challenges of cultural diversity in higher education, the need for inclusion and sense of belonging within and beyond student groups, creating spaces for sharing and building community, ensuring transparency, consistent communication, and psychological safety (Clark, 2020) to learn AND to question the status quo. And more importantly, asking students as to how they are doing and probing past "I'm fine." These efforts should go beyond celebrating diversity in the abstract or establishing cultural clubs or centers. Doctoral students have specific needs and different lifestyles compared to most undergraduates and benefit from a solid relationship within their disciplinary "home." We hope that our example will help you as a student or faculty member to feel more comfortable to share who and what you are, to share individual differences to help each other on our chosen paths.

References

Bakhtin, M. (1986). *Speech genres & other late essays* (C. Emerson, Trans.). University of Texas Press.

Berry, J. W. (2006). Stress perspectives on acculturation. In D. L. Sam & J. W. Berry (Eds.), *The Cambridge handbook of acculturation psychology* (pp. 43–57). Cambridge University Press.

Bothello, J., & Roulet, T. (2019). The imposter syndrome, or the mis-representation of self in academic life. *Journal of Management Studies, 56*(4), 854–861.

Bruner, E. M. (1984). Introduction: The opening up of anthropology. In S. Plattner & E. M. Bruner (Eds.), *Text, play, and story: The construction and reconstruction of self and society—1983 proceedings of the American ethnological society* (pp. 1–16). American Ethnological Society.

Christie, H., Tett, L., Cree, V. E., Hounsell, J., & McCune, V. (2008). 'A real rollercoaster of confidence and emotions': Learning to be a university student. *Studies in Higher Education, 33*(5), 567–581.

Clark, T. R. (2020). *The 4 stages of psychological safety: Defining the path to inclusion and innovation*. Berrett-Koehler.

El-Ghoroury, N. H., Galper, D. I., Sawaqdeh, A., & Bufka, L. F. (2012). Stress, coping, and barriers to wellness among psychology graduate students. *Training and Education in Professional Psychology, 6*(2), 122–134. https://doi.org/10.1037/a0028768

Heilbrun, C. (1988). *Writing a woman's life*. Balentine Books.

Knox, S., Sokol, J. T., Inman, A. G., Schlosser, L. Z., Nilsson, J., & Wang, Y. (2013). International advisees' perspectives on the advising relationship in counseling psychology doctoral programs. *International Perspectives in Psychology: Research, Practice, Consultation, 2*(1), 45–61.

Moen, T. (2006). Reflections on the narrative research approach. *International Journal of Qualitative Methods, 5*(4), 56–69.

Polkinghorne, D. E. (1988). *Narrative knowing and human sciences*. State University of New York Press.

Poyrazli, S., & Kavanaugh, P. R. (2006). Marital status, ethnicity, academic achievement, and adjustment strains. *College Student Journal, 40*(4), 767–780.

Tomlinson, J. (2007). *The culture of speed: The coming of immediacy*. Sage.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

White, H. (1987). *The content of the form: Narrative discourse and historical representation*. Johns Hopkins University Press.

Zellermayer, M. (1997). When we talk about collaborative curriculum-making, what are we talking about? *Curriculum Inquiry, 27*(2), 187–214.

Zhang, J., Smith, S., Swisher, M., Fu, D., & Forgarty, K. (2011). Gender role disruption and marital satisfaction among wives of Chinese international students in the United States. *Journal of Comparative Family Studies, 42*(3), 523–542.

Instructional Design and Semiotics

Kathryn Ley and Ruth Gannon-Cook

Since its inception, educational theory and philosophy have percolated into instructional design (ID) practice, first through behaviorism, then cognitivism, constructivism, and more recently, semiotics. Until relatively recently, second language educators dominated educational research that applied semiotic principles and analysis to formal learning. Last century, while academics explained learner meaning-making rooted in educational psychology (Reiser, 2001; Richey et al., 2011), marketing researchers and advertising practitioners explored semiotic analysis to predict and manipulate consumer responses to semiotic features (Gannon-Cook & Ley, 2020; Mick et al., 2004; Pinson, 1988). Marketing successes have reinforced the power of semiotics and offered insights for educators seeking to leverage semiotics to improve learner outcomes. Marketing professionals have recommended communications based semiotic objectives (Conejo & Wooliscroft, 2015) and semiotic analysis to drive more effective advertising campaigns with better brand and image recognition (Sobocińska, 2016). Successful marketing campaigns have leveraged socio-cultural signs to elicit positive consumer responses as measured by customer attitudes, loyalty, sales, etc. toward a brand or product. Until recently, educational psychology factors dominated instructional and learning science research. More recently, semiotics has expanded instructional and learning research to address the learner's perceptions and culture, and ubiquitous online learning has invigorated ID practice and underscored the relevance of learning context to learning processes and learning outcomes.

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Semiosis

A constructivist experiential curriculum replaced rote learning with a learner's abductive, subconscious, and meaningful learning which has demanded more than formulaic repetition (Gannon-Cook & Ley, 2020). Hence, semiotics and constructivism have compatible and complimentary epistemological roots (Olteanu et al., 2016). A constructivist epistemology posits all knowledge and meaning have been derived, an assumption consistent with semiotics (Mick, 1986). When educators first suggested a semiotic framework as a viable pedagogical approach, it was proffered as an alternative to behaviorism (Cunningham, 1992; Shank, 1992) or constructivism (Cunningham & Kehle, 2003). Semiotics, the study of signs, evolves around semiosis, an irreducible tripartite process. For semioticians, semiosis depends upon the triadic mediation among three abstract concepts termed the sign, the signifier, and the signified (Campbell, 2019) (Table 1).

Semiotics explains learning as a tripartite process by which humans interpret signs and symbols, the very foundation of communications. The learner embodies agency within the triadic relationship among a sign, its object (signifier), and a mediating interpretant (signified) (Bonnycastle, 2005; Shank, 1992). The mediating interpretant, the learner, makes meaning from a signifier and the sign. Learners, accompanied by their culture and lived experiences, make meaning from the words and images supplied by the instruction and the learning environment. Semiotics explains why learners may react and interact with instructional materials and learning environments quite differently from a designer's implicit assumptions and expectations.

A semiotic anecdote exemplifies the discrepancy between the learner's interpretation of signifiers and the intended sign. A British firm had developed online employee technical training for an Indian enterprise following design features and appearance based upon the designer group's implicit cultural norms, British norms. The training skill and knowledge outcomes were positive, employees learned the intended skills, but they were less than enthusiastic about the instructional experience. The British project manager asked an Indian colleague to review the instruction and agreed that his Indian colleague could change anything but the content. The Indian designer returned colorfully and graphically enhanced instruction with semiotic features appealing to the Indian employees. Their noticeably more positive response indicated semiotic design derived from learners' cultural context had added learner appeal. Semiotic design amplified learning outcomes by boosting

Table 1 Semiotic tripartite mediation terms, definitions, & examples

Semiotic term	Term definitions	Example
Sign	Real or imagined object	
Signifier	Represented object, sound, word, image, odor	Fireworks
Signified	Viewer's filtered mental concept	

learner affective response while maintaining measurable skills, knowledge, abilities, and attitudes (SKAAs) learning outcomes. This training anecdote illustrated the mediating influence of an online learning environment on learner semiosis, and the semiotics design potential.

Another semiotic example illustrates a gap between an educator's or designer's intended conceptual message and the learner's interpretation. The instruction signifies pyrotechnics with the word "fireworks," but the interpretant image or association may be a sparkler if the learner is a child or a brand logo, if a fireworks vendor (Fig. 1).

Even physical objects illustrated with photographic signifiers may be open to the learner's interpretation, not the designer's or educator's intended comprehension. For example, a corporate logo, such as Amazon© or the word "Amazon," may elicit positive and negative associations and responses for different contexts and viewers. Signifieds, or interpreted associations with less than positive experiences or knowledge, may be barriers to engaging learners. On the other hand, signifieds that reinforce the learners' positive cultural experiences and affiliations invite learner engagement. Representing values with physical objects, such as nationalism with a national flag, or religion with signifiers, such as a crescent or cross, may be less open to interpretation than concepts lacking a recognized signifier, such as rationalism or egalitarianism.

If the signifier represents an abstract concept without a physically manifested sign and must depend upon associations with an abstract concept, the interpretant may be even further from the instructional intent than with a concrete signifier. The term, semiotics represents multiple complex relationships among abstract concepts and therefore open to interpretations that distort intended meaning. Learner

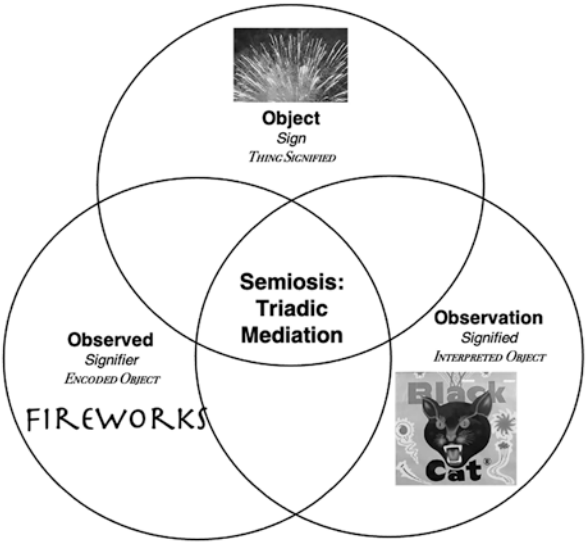

Fig. 1 Semiosis

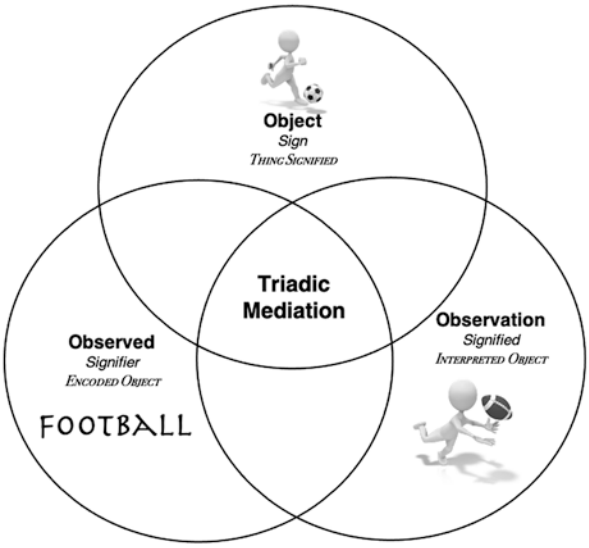

Fig. 2 Triadic mediation: Football sign, signifier, signified

experiences may moderate semiosis, yielding interpretants and observations more discrepant from what was intended for signifiers such social justice and Critical Race Theory than for a physical signifier such as football. For example, academics may have an explicit definition or criteria for Critical Race Theory, but some learners may associate the term with an attack on white supremacy. The definition depends more upon the defining words rather than on observable, measurable, characteristics such as a football game. A Brazilian instructional designer may have one interpretation of a football game, but an American learner would have quite a different one (Fig. 2). The designer may use the term and intend the signifier to represent the sign, but the learner's cultural filter has signified American football, thereby deviating from the designer's intended meaning.

Still, semiotic applications necessarily must aim for global generalizations within a learner group; designing for semiotic engagement directs attention toward a sociocultural group with commonly shared values manifested as recognizable signifieds. Semiotic design embeds features familiar and appealing to the learner group and avoids unfamiliar or pejorative representations or format.

Semiosis as Learning

Semiosis, always a triadically mediated process, has been produced by the learner's sensory experiences and filtered by a plethora of signifiers and signs present and sensed. Semiosis produces a contextualized learning resulting from the observations mediated by the learner's sensed signs with past experiences. Semiotics directs

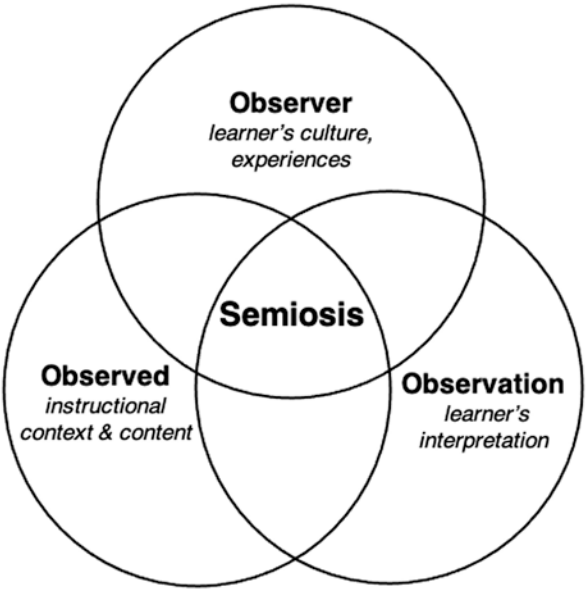

Fig. 3 Semiosis as learning

attention toward the learner's contribution to, and interaction with, a learning context, content, and environment. By logical extension, four components comprise the learner semiosis: (a) the learner (their culture, SKAAs); (b) the instruction (learning environment content and context); (c) the observing or observation, the learner's interpretation; and (d) semiosis, the triadic mediation process for learning (Fig. 3).

Therefore, the learner's culture, experiences, and skills, knowledge, abilities, and attitudes (SKAAs) integrally mediate a learning environment and its attendant instructional context and content. Semiosis occurs at the intersection of the instructional context and content with the learner's culture and experiences and their knowledge, attitudes, and motivations. Semioticians describe the mechanism for semiotics cognition as habit: "A strong habit to act in a certain way in a certain situation" forms a primitive belief that the social activity of observing expands to knowing (Pikkarainen, 2014, p. 632). Humans consciously and unconsciously build a socio-cultural contextual perspective established through observation. Like an oyster bed layering more shells upon the predecessors in the same location, once the familiar cultural signifiers become part of the learner's vernacular, additional experiences tend to be explained through the same perspective.

Specified in learning theory last century, learner motivation and attitudes were assumed entry level requirements for instruction (Gagné, 1965). This tenuous assumption ignored the semiotic implications for most critical instructional design and development activities when learners and educators do not share a common cultural and experiential background (Gannon-Cook & Ley, 2020). Semiotics

explains motivation as the learner's response to the learning environment given their undeniable and influential experiences and knowledge.

The Learner and Triadically Mediated Learning

Semiotics defines semiosis as a triadic mediation process among the observer, observed, and the observation; the learner interprets the observed instructional content and context, their conscious and subconscious, experiential and cultural influences thus giving rise to their cognition and affect. Instructional materials encode content with message design, images, stories, and metaphors, but learning resides within the learner; the learner interprets the encoded instructional content within the learning context. The learner's experiences and culture invariably, importantly, and primarily mediate the learner's comprehension, affect, motivations, and attitudes. The learner's entry-level SKAAs influence and enable the learner's cognitive responses, but their experiences and culture mediate their interpretation of the entire learning environment and ultimately what they have learned implicitly and explicitly. Therefore, the viewer brings meaning to verbal and visual messages beyond the physical words, images, colors (Pettersson, 2012).

The learning environment encompasses several semiotic object categories including, but not limited to, images, stories, metaphors, message design, encoded content, etc. Any aspect of the learning environment the learner experiences and senses, whether heard, touched, seen, tasted, or smelled, comprises the learner's learning environment. Therefore, semiotic studies account for the physical, sociological, psychological, and biological factors comprising a learning environment and influencing learners. A semiotic analytical approach to instructional design not only accounts for the learners' SKAAs but also their cultural and experiential background, primary learning influencers. Semiotics has relevance for instructional design not only for learner analysis but throughout the design and development process.

Semiosis and Instructional Design

The military training demands of World War II spawned systematic design (Reiser, 2001) and its emphasis on explicit learner entry-level skills to assure effective and efficient instruction. Learner analysis and learner motivation have been a conceptually and practically important part of design models (Dick et al., 2015; Keller, 2010). In the ADDIE model, learner analysis included "culture make-up" and implementation depends upon cultural context (Branch, 2009, p. 38). The ID knowledge base has encompassed learner analysis and cultural considerations in theory (Richey et al., 2011) but few researchers investigated semiotics and its instructional implications.

When designers and educators share a common cultural context with the learners, assuming the learner's expected and desired response, that is, semiosis, may be desirably efficient and effective. On the other hand, semiotic design considerations assume more instructional relevance and importance as learners' cultural context diverges more from the instructional designer's culture and the design process does not account for the semiotic implications in the instructional design and development process (Kinuthia, 2009; Saxena, 2011). More recently, ID literature has acknowledged culture's critical role in learning. Meaningful, effective and durable learning must address three factors: "activity (practice), concept (knowledge), and culture (context)" (Ertmer & Newby, 2013, p. 56). Therefore, not accounting for the viewers' culture and education has failed to meet minimum design requirements (Nadin, 1988).

If effective instructional strategies promote measurable learning outcomes, engaging instruction also conveys instructional messages consistent with the learner's culture and education. Young's (2009) culture-based model articulated 25 cultural elements from three categories—anthropology, psychology, and science—for gauging the learner's culture; the work outlines data-collection processes to populate a learner analysis. Implementing the model yields a culturally-focused learner analysis suitably feasible and warranted for scaled-up cross-cultural training projects. Young's culture-based model has added to the design knowledge base with an enhanced but labor-intensive learner analysis. Semiotics does not replace this model but offers a wider analytical scope and an interdisciplinary foundation to describe semiosis and suggest semiotic design and development practices such as learner analysis or culturally consistent message design and instructional features.

Operationally, learner analysis identifies learner SKAAs as measured by grades, education level, standardized test scores, performance evaluations, etc. Entry level SKAAs determine the entry level instructional objectives. This learner analysis approach works well when the instructional designer/educator/SME shares common cultural experiences and knowledge with intended learners. Learner analysis and the ID knowledge base has emphasized the learner's cognitive and psychomotor skill gaps but assumes that the learner's beliefs, culture, and values inconsequentially influence learning outcomes. Until the advent of a connected, transnational, educational world this assumption held when educators and learners shared the same semiosphere. ID can no longer assume learner values and beliefs align with those of the designer's because race, gender, ethnicity, culture, and social class have been inextricably linked to instruction (Kinuthia, 2009).

As the likelihood that the instructional designer/educator/SME does not share the learner's culture, values, and beliefs increases, so does the likelihood that the learner's semiosis may differ from the designer's intended learning objectives. A learner's cultural context can be far removed from the instructional designer's cultural context. As the learner's cultural experience and context deviates further from the instructional designer/educator/SME's culture and experience, the threat to instructional effectiveness posed by unappealing, confusing, or alienating signifieds increases and the opportunity to harness semiotics for enhancing instructional appeal passes. Consequently, a designer may miss an opportunity to leverage semiotic features for optimal appeal and to avoid the threat of inadvertently alienating or confusing learners with images, words, or presentation (Gannon-Cook

& Ley, in press). Further establishing semiotic design relevance and to mitigate cultural bias originating from learner analysis limitations, Saxena (2011) proposed five cross-cultural designer competencies, one of which was developing and implementing a cross cultural learner analysis model or toolkit.

Design Models, Learner Affect, and Semiotics

Initial systematic design approaches promoted efficient learning through instruction directed toward a specific outcome. Activities and elements that contributed to specific, measurable learning outcomes were included in the design and development process and those that did not, were avoidably wasteful. Instructional design practice gauged learner skills based upon performance standards, previous content, or, when revising a course, instructor/faculty feedback on what works and what does not with respect to outcome skills. This approach failed to recognize triadic learner semiosis and its instructional implications. When semiosis has not been explicitly linked to instructional design process, semiotics has remained largely outside the scope of systematic design.

Design models have not diminished as much as ignored learner's beliefs, emotions, and most critically, their cultural context. Systematic design models have structured a process to assure that learning happens as effectively and efficiently as possible by addressing the conditions required for the intended learning outcome given learner entry level skills. The conditions of learning codified nine instructional events essential to learning defined as a change in behavior (Gagné, 1985). Earlier ID theory and the models assumed learner motivation essential although most models lacked explicit design guidelines for motivating learners. The dominant learning efficiency goal assumed and consequently ignored design for affective learner outcomes. Systematic design embodies purposeful process logically aimed to support learning for specified measurable knowledge, skill, and ability outcomes. This efficiency driver dominated early design theory and practice until learner motivation received more attention. Keller's (2010) model prescribed four instructional motivation traits with design strategies for each.

Systematic design models framed rational, data-based, ideal processes to accomplish specified, measurable learning outcomes. Message design principles initially promulgated craft-based practice but over time incorporated scientific knowledge (Boling et al., 2014). Design to foster a positive relationship between the learner and the learning environment remained limited despite its potential influence. The instructional design phase ideally yielded an instructional strategy to close the gap between the learner's entry-level skills and desired outcome skills. The learner who exhibited the desired outcome skill after completing the instruction displayed the ultimate measure of instructional effectiveness but not necessarily its engaging appeal. Specific instructional strategies have supported specific learning outcomes, but instructional context also influences learner affective responses to the learning environment. Just as effective strategies for rote memorization differ from strategies

for problem-solving, appealing message design for one culture differs from message design for a different culture. Because learning environment and instructional appeal depends upon what the learner brings to the learning environment beyond explicit entry-level skills, semiotic design emphasizes instructional appeal derived from the learner's culture, beliefs, attitudes, emotions, etc.

The advent of online learning has oriented ID toward the learner. By 2013 the International Board of Standards for Training, Performance and Instruction (ibstpi) had called for studying the relationship between cultural differences and ways of learning and advised adapting online learner competencies for local practice and culture (Beaudoin et al., 2013). Their validation study of online learner competencies revealed that for all but one group, online learner success emanated from learner traits and behaviors rather than any factors inherent to the course. A semiotic perspective might explain this counter-intuitive phenomenon as a function of the learner's response to the learning environment. The relationship between the learner and the learning environment influences a learner's receptivity to the learning environment. Semiotic design features draw upon the learner groups' culture, beliefs, attitudes, values, and emotions to promote learning environment appeal and learner engagement (Gannon-Cook & Ley, 2020, in press). Semiotic design accounts for the relationships and interactions among the learner's experiential-cultural background, the learning content and context, and the learner's interpretation.

Learner appropriate semiotic features promote learner engagement and motivation. Affective responses may be reinforced and enhanced through instructionally appealing design. A semiotic design instantiates an appealing, culturally appropriate learner context given the learner's society, school, home, customs, mores, political, and organizational and institutional practices and knowledge. Instructional context promotes or undermines learner engagement on a continuum from minimal influence to most engaging or most alienating. Semiotic features consistent with the viewer's culture and context draw upon the viewer's culture to develop an appealing learning environment.

Semiotic Design

Building upon multi-disciplinary research, Gannon-Cook and Ley (2020) proposed an adaptation to a widely used systemic design model. Their semiotically informed ID model included processes where semiotic information and imaginative interpretation may be most useful for ID decisions. Learner analysis documents SKAAs, motivations, and cultural context and sets parameters for semiotic features including message design, encoded images, stories, and metaphors. The analysis, design, development, implementation, and evaluation model (Gustafson & Branch, 2002) can explicitly address semiotics when learner analysis information drives each phase and incorporates semiotic features consistent with the learner analysis information and assiduously avoids inconsistent alienating features (Fig. 4).

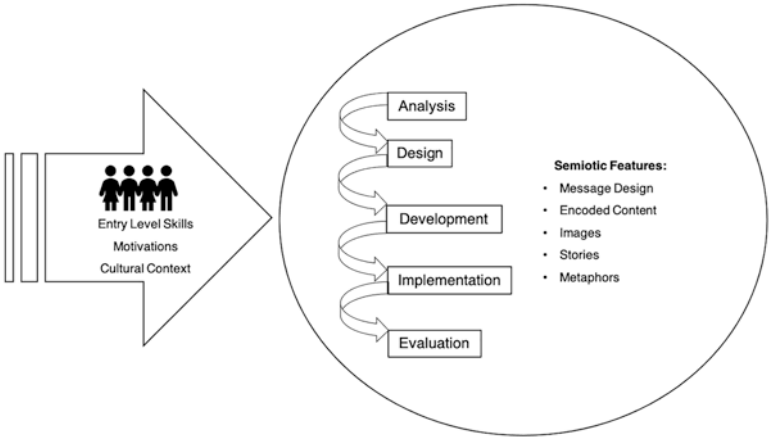

Fig. 4 Learner analysis, design, and semiotic features

SKAAs have typically been measurable performance indicators and well-suited to inductive hypothesis testing, but less so for abductive reasoning, semiosis, and semiotic analysis. Accounting for learner culture and experience, a more complex task than determining what SKAAs they lack, might seem an overwhelmingly impossible task. Yet, semiotics has permeated learning for millennia (Gannon-Cook & Ley, 2020), and historical lessons have suggested how designers might use semiotics to their advantage. A successful application of semiotic theory has illustrated the transdisciplinary nature of semiotics through marketing, a remarkably effective semiotics application.

Semiotic Features

Signifiers for which cultural differences filter meanings have relevance for instructional materials and the learning environment. Resonating signifiers predispose learners to engage signifiers but signifiers transformed into counterproductive responses, interpretants, subconsciously discouraging or repelling learners. An interpretant that embodies counterproductive associations for the learner does not promote the desired learning and threatens to undermine it. Attending to semiotic principles with course features and attributes removes learning barriers and improve learning outcomes.

Learner affect, how learners respond to learning environment content and context influences, may be conceptualized as a continuum from intrinsically motivated engagement to neutral affect to purposeful avoidance. Message design, encoded content, images, stories, and metaphors may be included for instructional purposes

to harness their positive semiotic influence. Message design remains important if not critical in online and print instruction despite the current edition of *Handbook of Research on Educational Communications and Technology* (Bishop et al., 2020) omitting the message design chapter from the earlier edition (Bishop, 2014). The literature on effective message design has implicitly accounted for semiosis with the caveat that verbal and visual messages to a large degree resides in the viewer not only the words, visuals, shapes, and colors (Pettersson, 2012). Semiotically appropriate instructional features and attributes engender learner appeal and interest based upon their socio-cultural interpretive lens.

Visuals such as images, graphics, drawings, icons, paintings, animations, cartoons, photos, videos, emojis, etc., influence learning. A plethora of studies have revealed relationships between visual attributes and cognitive learning outcomes (Mayer, 2009, 2019). Visual images subconsciously layer affect into the learning environment. Initially visual learning studies substantiated relationships between visual quality, quantity, or content and cognition (Mayer, 2014) as measured by content exams and application or performance tests. Cognitive-affective models (Mayer, 2019) have revised earlier cognitive media learning theory to encompass learner reactions and affective responses (Mayer, 2020).

Visual representations attract conscious and subconscious learner attention followed by a learner affective response. A learning environment employs instructional graphics for those two functions, gaining attention and inducing positive affect, plus a third function, instructing (Sung & Mayer, 2012). Visual communications, images, have altered learner recall (Lin et al., 2016) and instructionally relevant graphics improved student learning from text (Mayer, 2009). Interesting graphics combined with instructionally relevant graphics significantly improved learner satisfaction with the online lessons (Sung & Mayer, 2012). Regardless of function, graphics increased undergraduates' positive online lesson assessments, and combining instructionally relevant graphics with interesting graphics significantly improved online learner instructional satisfaction (Sung & Mayer, 2012). Visual stimuli convey a thematic subtext presented in most online academic presentations. The presentation visuals and response vary by the subtext; a talking head with a backdrop of university logos discussing an event elicits a different affect from a video of the discussed events. Whether instructional or merely interesting, visuals have elicited positive learner affect.

Metaphors, another semiotic feature, may merely be stylistic adornments but they may also facilitate meaning-making with symbolic resources reflecting human universals (Pern, 2015). While communicating rhetorical embellishments, metaphors shape and generate human thoughts, actions, and language, the foundation of conceptual systems (Elhindi, 2009). Stories record real or imagined events that actively engage learners, enabling efficient information storage, retrieval, and communication (Gargiulo, 2006). A story can call forth unconscious thought processes (Oswald, 2012). These familiar semiotic objects, visuals, metaphors, and stories, commonly found in advertising, may be adapted for online learning (Gannon-Cook & Ley, 2020) (Fig. 5).

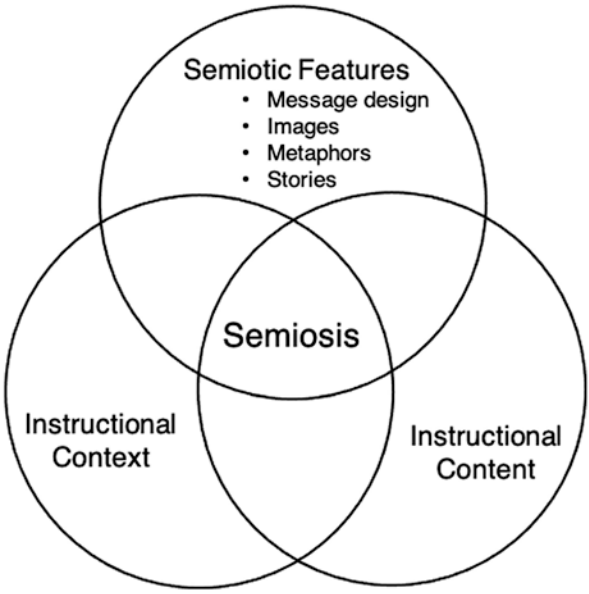

Fig. 5 Semiosis: Context, content, & features

Storytelling compared favorably to a popular Western memory technique, imagining a building with rooms containing items to remember (Reser et al., 2021). Western students trained briefly in both methods remembered significantly more with the Aboriginal story-telling technique. This study holds implications for instructional strategies rarely studied in educational research but accessible through a transdisciplinary approach to educational research. Including semiotic features opens research and practice possibilities to educators and instructional designers. Educators can introduce semiotically appropriate message design, images, metaphors, and stories and set the stage for semiotic instructional design studies.

Enhancing Research with Semiotics

Semiotics seems incompatible with the familiar hypothesis testing, inductive reasoning, and the dualism of right and wrong, true and false, the underpinnings of educational research, withstanding qualitative investigations more common in constructivist studies. Semiotics does not inform educational research but it reframes it in a thousand ways. Semioticians have heretofore eschewed quantitative methods and hypothesis testing but this un-semiotic approach paradoxically narrows the research window. Educational researchers have argued that semiotics has suggested an alternative to established quantitative and qualitative methods (Shank, 1992). Semiotics has presented an educational vision in which learning objectives and

teaching practices addressed the learners' life experiences (Midtgarden, 2005). Semiosis refers to sign production and sign-based behavior (Danesi, 2011); it is the process of engaging the mind and senses that enables the learner to meaningfully interpret signs (Seel, 1999) and to build experience structures (Cunningham, 1992). Semiosis, a dynamic signification process (Deely & Semetsky, 2017), conceptually represents learning as "a signification process mediating learner and environment" (Campbell, 2019, p. 292).

Semiotics casts a wide transdisciplinary, interdisciplinary, and multidisciplinary net (Seif, 2016, 2017) constructed from philosophy and linguistics but also encompassing biology, psychology, anthropology, sociology, and other disciplines investigating human cognition, emotions, and consequent behavior (Gannon-Cook & Ley, 2020). Semiotic analysis reveals the instructional implications posed by the triadic mediation among the observer, the observed, and the observation. Despite describing learning as its result, some assert semiosis, the action of signs, has framed a sophisticated educational philosophy rather than an experiential learning theory (Strand, 2013). Whether a learning theory or an educational philosophy, semiotics has enabled researchers to investigate semiotic features supporting learner sociocultural influences on meaning-making.

Quantitative studies have collectively explained learner motivation and affect with factors consistent with semiosis as learning. Studies investigating any part of the triadic mediation process can inform semiotic analysis. A semiotic triadic mediation analysis incorporates the learner's experience and knowledge but also the learning environment and context; image and text appearance influences learner semiosis just as content does.

Inductive reasoning has a place in the reasoning cycle to explain learning phenomenon, but only abductive reasoning explains learning phenomenon with transdisciplinary, interdisciplinary, and multidisciplinary roots. Unlike learning theories that have been tested with extensive inductive reasoning using its primary analytical technique, hypothesis testing, semiotics requires abductive reasoning, a necessarily qualitative technique. Hypothesis testing for learning theories have numerically operationalized factor(s) to statistically predict probabilities. In an attempt to account for more factors to explain their influence on learning outcomes, hypothesis testing has added complex statistical analyses to explore learning through model building with multiple numerically-defined factors. Inductive reasoning has a place in the reasoning cycle to substantiate learning phenomenon, but only abductive reasoning goes beyond what a learning theory posits to explain learning phenomenon with transdisciplinary, interdisciplinary, and multidisciplinary roots.

For example, Gannon-Cook and Ley (2020, in press) cited divers inductively reasoned studies to describe learning, semiosis, as a triadic mediation process among sign, signifier, and signified influenced what the learner experiences (smells, feels, sees, touches, hears, thinks) in a learning environment comprised of signifiers intentionally arranged during the design and development process and unintentional artifacts of the learning context; semiosis entails both intentional and unintentional stimuli. Abduction leads to new learning through the process of incorporating anomalous events into the analysis differs from inductive hypothesis testing that

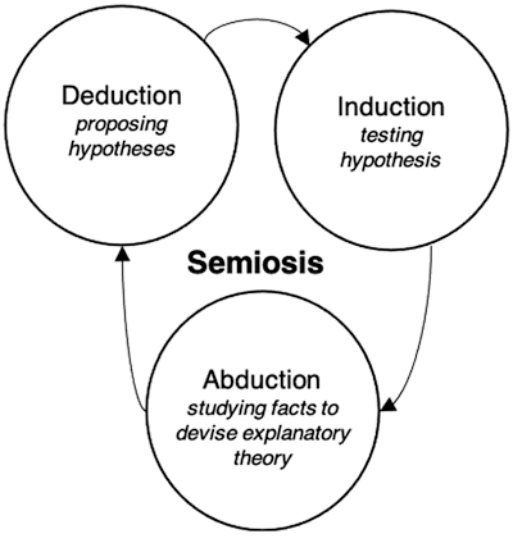

Fig. 6 Cyclical reasoning for sign interpretation: Deduction, induction, abduction

exclude anomalies relegated to bad data or statistically discounts outliers. Semiosis, a cyclical sign-action process, applies signs to explain some phenomena (induction), to reason from sign to sign (deduction); and to use signs to explain some new phenomena (abduction) (Cunningham, 1998, p. 833; Mick, 1986) (Fig. 6).

Conclusion

Semiotics, edusemiotics, and semiosis frame a learning process that fosters transdisciplinary, interdisciplinary, and multidisciplinary findings to expand the scope of ID research and improve ID practice. Semiotics has a place in educational research and practice in the classroom and in research that places learner semiosis at the center of learning. Semiotics acknowledges stories, compelling images, and metaphorical narratives have transmitted learning for centuries. Contemporary relevance and adaptability to the virtual learning environments, semiotics suits educational researchers and practitioners who are drawn beyond their disciplinary silos for questions and answers.

References

Beaudoin, M., Kurtz, G., Jung, I., Suzuki, K., & Grabowski, B. (2013). *Online learner competencies: Knowledge, skills, and attitudes for successful learning in online settings* (ibstpi Book Series). Information Age.

Bishop, M. J. (2014). Instructional message design: Past, present, and future relevance. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 373–383). Springer.

Bishop, M. J., Boling, E., Elen, J., & Svihla, V. (Eds.). (2020). *Handbook of research in educational communications and technology: Learning design* (5th ed.). Springer.

Boling, E., Gray, C. M., Modell, M. G., Altuwaijri, A., & Jung, J. (2014). Learners interpreting instructional images: Meaning-making and decision-making strategies. *Journal of Visual Literacy, 33*(2), 27–52. https://doi.org/10.1080/23796529.2014.11674716

Bonnycastle, D. (2005). Educational semiotics and instructional design. *Educational Technology, 45*(2), 35–38. https://doi.org/10.2307/44429199

Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer. https://doi.org/10.1007/978-0-387-09506-6_3

Campbell, C. (2019). Educating semiosis: Foundational concepts for an ecological edusemiotic. *Studies in Philosophy and Education, 38*(3), 291–317. https://doi.org/10.1007/s11217-018-9617-4

Conejo, F., & Wooliscroft, B. (2015). Brands defined as semiotic marketing systems. *Journal of Macromarketing, 35*(3), 287–301. https://doi.org/10.1177/0276146714531147

Cunningham, D. J. (1992). Beyond educational psychology: Steps toward an educational semiotic. *Educational Psychology Review, 4*, 165–194. https://doi.org/10.1007/BF01322343

Cunningham, D. J. (1998). Cognition as semiosis: The role of inference. *Theory & Philosophy, 8*(6), 827–840. https://doi.org/10.1177/09593543980860006

Cunningham, D. J., & Kehle, P. E. (2003). Cognitive semiotics in education. *Recherches en Communication, 19*(19), 35–56.

Danesi, M. (2011). Semiotics. In M. Ryan (Ed.), *The encyclopedia of literary and cultural theory* [online]. Wiley.

Deely, J., & Semetsky, I. (2017). Semiotics, edusemiotics, and the culture of education. *Educational Philosophy & Theory, 49*(3), 207–219. https://doi.org/10.1080/00131857.2016.1190265

Dick, W., Carey, L., & Carey, J. O. (2015). *The systematic design of instruction* (8th ed.). Pearson.

Elhindi, Y. (2009). Metaphor. In S. Chapman & C. Routledge (Eds.), *Key ideas in linguistics and the philosophy of language*. Edinburgh University. https://search.credoreference.com/content/entry/edinburghilpl/metaphor

Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 26*(2), 43–71. https://doi.org/10.1002/piq.21143

Gagné, R. (1965). *The conditions of learning*. Holt, Rinehart & Winston.

Gagné, R. (1985). *The conditions of learning* (4th ed.). Holt, Rinehart & Winston.

Gannon-Cook, R., & Ley, K. (2020). *Engaging learners with semiotics*. Sense/Brill.

Gannon-Cook, R., & Ley, K. (in press). Semiotic design for online learning environments. In A. Bilgari (Ed.), *Open semiotics.* Kimé.

Gargiulo, T. (2006). Power of stories. *The Journal for Quality and Participation, 29*(1), 4–8, 43.

Gustafson, K. L., & Branch, R. M. (2002). *Survey of instructional development models* (ED477517) (4th ed.). Syracuse University. https://eric.ed.gov

Keller, J. M. (2010). *Motivational design for learning and performance: The ARCS model approach*. Springer.

Kinuthia, W. (2009). Reflecting on embedding socio-cultural issues into instructional design. *Multicultural Education & Technology Journal, 3*(4), 266–278. https://doi.org/10.1108/17504970911004273

Lin, L., Atkinson, R., Savenye, W., & Nelson, B. (2016). Effects of visual cues and self-explanation prompts: Empirical evidence in a multimedia environment. *Interactive Learning Environments, 24*(4), 799–813. https://doi.org/10.1080/10494820.2014.924531

Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University.

Mayer, R. E. (2014). Cognitive theory of multimedia learning. In R. E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (2nd ed., pp. 43–71). Cambridge University. https://doi.org/10.1017/CBO9781139547369.005

Mayer, R. E. (2019). Thirty years of research on online learning. *Applied Cognitive Psychology, 33*(2), 152–159. https://doi.org/10.1002/acp.3482

Mayer, R. E. (2020). Searching for the role of emotions in e-learning. *Learning & Instruction, 70*, N.PAG. https://doi.org.uhcl.idm.oclc.org/10.1016/j.learninstruc.2019.05.010

Mick, D. G. (1986). Consumer research and semiotics: Exploring the morphology of signs, symbols, and significance. *Journal of Consumer Research, 13*(2), 196–213.

Mick, D. G., Burroughs, J. E., Hetzel, P., & Brannen, M. Y. (2004). Pursuing the meaning of meaning in the commercial world: An international review of marketing and consumer research founded on semiotics. *Semiotica, 152*, 1–74.

Midtgarden, T. (2005). On the prospects of a semiotic theory of learning. *Educational Philosophy & Theory, 37*(2), 239–252. https://doi.org/10.1111/j.1469-5812.2005.00112.x

Nadin, M. (1988). Interface design: A semiotic paradigm. *Semiotica, 69*, 269–302.

Olteanu, A., Kambouri, M., & Stables, A. (2016). Predicating from an early age: Edusemiotics and the potential of children's preconceptions. *Studies in Philosophy & Education, 35*(6), 621–640. https://doi.org/10.1007/s11217-016-9526-3

Oswald, L. (2012). *Marketing semiotics*. Oxford University.

Pern, T. (2015). Imagination in Vico and Hobbes: From affective sensemaking to culture. *Culture & Psychology, 21*(2), 162–184. https://doi.org/10.1177/1354067X15575794

Pettersson, R. (2012). Introduction to message design. *Journal of Visual Literacy, 31*(2), 93–104. https://doi.org/10.1080/23796529.2012.11674702

Pikkarainen, E. (2014). Competence as a key concept of educational theory: A semiotic point of view. *Journal of Philosophy of Education, 48*(4), 621–636. https://doi.org/10.1111/1467-9752.12080

Pinson, C. (1988). Introduction to the double special issue on semiotics and marketing communication research. *International Journal of Research in Marketing, 4*(3), 167–172. https://doi.org/10.1016/S0167-8116(88)80002-8

Reiser, R. A. (2001). A history of instructional design and technology: Part I: A history of instructional media. *Educational Technology Research and Development, 49*(1), 53–64. https://doi.org/10.1007/BF02504506

Reser, D., Simmons, M., Johns, E., Ghaly, A., Quayle, M., Dordevic, A. L., Dordevic, A. L., Tare, M., McArdle, A., Willems, J., & Yunkaporta, T. (2021). Australian aboriginal techniques for memorization: Translation into a medical and allied health education setting. *PLoS One, 16*(5), e0251710.A. https://doi.org/10.1371/journal.pone.0251710%0A

Richey, R. C., Klein, J. D., & Tracey, M. W. (2011). *The instructional design knowledge base: Theory, research, and practice*. Routledge.

Saxena, M. (2011). Learner analysis framework for globalized e-learning: A case study. *International Review of Research in Open & Distance Learning, 12*(5), 93–107. https://doi.org/10.19173/irrodl.v12i5.954

Seel, N. M. (1999). Educational semiotics: School learning reconsidered. *Journal of Structural Learning and Intelligent Systems, 14*(1), 11–28.

Seif, F. Y. (2016). Can design inquiry advance edusemiotics? Rethinking factual information and imaginative interpretation. *Semiotica, 212*, 219–238. https://doi.org/10.1515/sem-2016-0122

Seif, F. Y. (2017). Transdisciplinarity of edusemiotics: Revealing mutual reciprocities between design and semiotics. *Chinese Semiotic Studies, 13*(1), 15–29. https://doi.org/10.1515/css-2017-0002

Shank, G. (1992). Educational semiotic: Threat or menace? *Educational Psychology Review, 4*(2), 195–209. https://doi.org/10.1007/BF01322344

Sobocińska, M. (2016). Premises and potential for the application of semiotics in marketing research. *Oeconomia, 15*(1), 123–132. https://aspe.sggw.edu.pl/article/view/408

Strand, T. (2013). Peirce's rhetorical turn: Conceptualizing education as semiosis. *Educational Philosophy and Theory, 45*(7), 789–803. https://doi.org/10.1111/j.1469-5812.2011.00837.x

Sung, E., & Mayer, R. E. (2012). When graphics improve liking but not learning from online lessons. *Computers in Human Behavior, 28*(5), 1618–1625. https://doi.org/10.1016/j.chb.2012.03.026

Young, P. (2009). Instructional design frameworks and intercultural models. *Information Science*. https://doi.org/10.4018/978-1-60566-426-2

Mobile Learning and Culturally Situated Practices for Equity in Brazil

Vivian Martins

Several previously dispersed tools, such as calendars, cameras, diaries, maps, and others, are now gathered and systematized in mobile device applications, enabling new uses and educational practices. Connection, ubiquity, context, and movement are mobile device features that contribute to education. Mobile learning, also m-learning, "refers to the learning that is involved with the mobility of students, where s/he can be engaged in the learning process in 'anytime anywhere' settings using mobile devices" (Al-Emran, 2021, p. 1).

Pedagogies that are sensitive to mobile connectivity have become more important due to the changes in Brazilian education, especially with the COVID-19 pandemic. Many students do not have computers and need to study using cell phones and tablets in Brazil. Recent research on the use of information and communication technologies in Brazilian schools and Brazilian residences (CGI.br, 2020a) has documented that 54% of urban school students used cell phones as the main device to monitor classes and remote activities during the pandemic. This is important for understanding the reality of Brazilian education and the relevance of mobile learning approaches, so as to avoid the pitfall of the digital divide and/or a potential out-of-context approach.

We seek to propose strategies for students to reach their full potential and learn with quality during this complicated moment for education (both during the pandemic and post-pandemic). We cannot realistically consider distance education for everyone if there are no appropriate resources and educational equity. We advocate for expansion of educational opportunities that personalize mobile learning to improve teaching practices, with the ultimate aim of accounting for students' diversity and necessities.

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This study is part of a doctoral research project on education conducted at the Rio de Janeiro State University. It aims to understand, in the context of research-training in cyberculture, what the learning and teaching tactics are with applications that are created daily in Brazilian educational networks, thus enabling the development of a Pedagogy of Hypermobility. *Hypermobility* (Santaella, 2007) is the union of physical space, mobile connection, and digital information. Thus, *Pedagogy of Hypermobility* refers to teaching with connection and movement, with a particular focus on pedagogical processes without walls, i.e., education without borders. In the following paragraphs, we contextualize the subject addressed in the Pedagogy of Hypermobility thesis (i.e., mobile learning) and present the research framework in this article.

The Mobile Learning Context During the COVID-19 Pandemic

Research studies in Brazil have investigated the use of information and communication technologies in Brazilian schools and Brazilian residences through the internet management committee in Brazil, *TIC domicílios 2019* or "ICT households 2019" (CGI.br, 2020a). Findings suggest that the mobile phone was considered the most used device to access the internet for 99% of the population. Of this 99%, 58% of the population only access the internet on a mobile phone; that is, they do not have other devices to access the internet. Other figures include: 58% of the students use their mobile phones to carry out school activities; 18% of urban school students and internet users access the internet exclusively by mobile phone; and 54% used cell phones as the main device to monitor classes and remote activities in the pandemic (CGI.br, 2020a).

The Brazilian K-12 educational system has a particularity, namely, that upper social classes study in private schools, and lower classes study in public schools. The study *Painel TIC Covid-19: pesquisa sobre o uso da internet no Brasil durante a pandemia do novo Coronavírus. 3ª edição: ensino remoto e teletrabalho* (TIC COVID-19 Panel: research on internet use in Brazil during the novel Coronavirus pandemic. 3rd edition: remote learning and telework; CGI.br, 2020b) reported that 87% of participants said that the institution where they studied offered remote educational activities, with a higher proportion among students in the private school system. In the same survey, 36% of participants reported difficulties in following classes due to lack or poor quality of internet connection.

How have mobile devices been used during the COVID-19 pandemic in Brazil? Reports suggest that cell phones were the main device used to engage in remote activities, but there are stark inequalities in students' access to the internet, highlighting a significant difference between social classes in Brazil. The Brazilian economic classification criteria stipulates five groups, characterized by letters: classes A, B, C, D, and E. Class A is the highest and class E indicates lower purchasing power and poor quality of life. Families in class E receive up to two

minimum wages. Among participants of the survey (CGI.br, 2020b), 74% of D and E social classes accessed the internet exclusively by cell phone, and 10% stated that they shared their cell phones with other household members. For participants in A and B classes, 11% accessed the internet only by cell phone.

Motivated by these glaring inequities, our research examined the cultural and social impacts of technology on education. Pegrum (2014) reflected on mobile learning to promote social justice in socially marginalized situations: "Mobile devices may lead to new educational opportunities which otherwise would not exist or would be difficult to access" (p. 40). We can see this reality in Brazil reflected in the data above. Thus, how can teachers promote mobile learning actions to provide better learning conditions?

In addition to access issues, students showed interest and engagement with mobile learning. Pebriantika et al. (2021) found in a survey of 110 students that "the significance level of 0.001 ($p < 0.05$) indicates that there is a significant influence between the adoption of mobile learning on student interest in learning during the COVID-19 pandemic" (p. 222). Farias and Silva (2020) found in a survey of 100 students that mobile devices are facilitating tools in the Brazilian school space: "There were significant changes in the use of devices in education, such as greater motivation on the part of students (45%), expansion of student learning and expansion of the teachers' information capacity (60%)" (p. 24). These results are important to expand the use of mobile learning after the pandemic, too. This can be done by thinking about practices that are more contextualized with students who fully experience digital culture.

Purpose and Research Questions

The overarching question that guided this work was: How did technological events that merged into our culture invite us to rethink education? The purpose of the current research was to create an educational design for an online course in which teachers signed up for continuous education in the Federal Institute of Rio de Janeiro. We[1] reflected on current pedagogical models, continuous and seamless learning and collaborative learning, with a mobile and hypermediatic curriculum supported through interactivity and diversity.

This study aims to answer the following specific research questions:

RQ1: How have mobile devices been used during the COVID-19 Pandemic in Brazil?

RQ2: How could educational environments be improved to create culturally situated learning?

RQ3: What factors should teachers consider when designing learning situations in mobile contexts?

[1] "We" includes the researcher, the advisors, the research group, and sometimes the research participants. We comprehend the research as a collective construction.

Methodological Approach

The methodology in this doctoral study is research-training in cyberculture (Santos, 2019), an epistemological fusion of multi-referential theories (Ardoino, 2003), and research on everyday life in schools (Alves, 2011) and cyberculture (Lévy, 1999). The methodology addresses the convergence between educational processes and scientific investigation considering contemporary culture mediated by digital technologies (Santos, 2019). Online education is one of the training possibilities considering contemporary culture and the technologies, for example. The research-training in cyberculture is based on life stories, whose methodological path is the narrative of life during educational experiences.

I am a professor-researcher at the Federal Institute of Rio de Janeiro. I developed my doctoral research field in my professional practice as a professor-researcher in distance education and educational technologies, especially in teacher training courses at the level of continued education. The teacher-researcher develops training environments that encourage students to narrate their training processes, to share their classroom experiences and insights regarding in-person and online classroom, with written, image, and audiovisual narratives. The teacher-researcher studies these narratives and the events in the field research.

Two outreach programs of the Federal Institute of Rio de Janeiro were used as a research field: teacher training for online education and teacher training for communication, culture, and art. The research interlocutors (students in continued education) were mostly in-service teachers working in the metropolitan region of Rio de Janeiro. The participants worked as teachers or education professionals. There are 52 participants in total. Their level of education ranged from undergraduate (completed or in progress) to graduate, and their ages varied between 23 and 58. The research participants lived in the State of Rio de Janeiro, in the region called Baixada Fluminense.

We created a didactic design to act as a research activity—that is, we created ambiances that answer our research questions. For example, if I want to research mobile learning, I develop training with mobile learning experiences and encourage students to share narratives about learning experiences, e.g., how students learn using mobile phones. The procedures used in this research followed five integrated stages: teaching dilemmas, research and training practices, the emergence of data, conversation with data (analysis procedures), and findings report.

Teaching dilemmas are the uneasiness caused by educators' practice, which promotes the need for research. In our study, we devised research questions and transformed them into educational processes and research actions. Research and training practices are researchers' methods and means (procedures) to instantly raise notions that better explain the research phenomena. To explore the participants' narratives, the professor-researchers activated research and educational practices, such as chat forums, training diaries, recorded conversations, and student assessments. The data emerged from face-to-face and online conversations, pedagogical practices, and the activities produced in the training. Data analysis is carried out through an expanded

triangulation including emerging data from the field, the researcher's experience, and the theoretical references studied. The researcher attributes meanings related to his/her involvement in the investigation. From this data analysis, the researcher creates subsumption notions, which is the development of theoretical-practical notions created from what made the most sense to the researcher. Those notions emerged from the analytical lenses and approaches used during the analysis of the data from the practice, the field experiences, and the narratives. The findings reported relied on the systematization of results produced from reflections, possibilities for practical applications, or indicators.

In this paper, we address the research considering everyday life in schools (Alves, 2011) as an epistemological option. This approach goes beyond the limiting assumptions of modern science. We assume the research unpredictablity and deepen our studies into everyday ordinary logic. We comprehend the research as a process, a path, and not merely a result. We understand the complexity of school time-spaces since our world's reading cannot be understood as the totality of routines and the multiple webs that cross them. We value the knowledge produced by practitioners (de Certeau, 2011) in the same horizontality as renowned theorists and dialogue with their narratives, which drive us to articulate ideas and understand what we research. Narratives created in the research field (narratives written by in-service teachers during the outreach program) might contribute to the further understanding of the teachers' perception of contextual mobile learning.

These narratives were fundamental for the collection and analysis of data. We understand narratives as any production or expression coming from the research participants. Narratives can emerge from life experiences (recorded by the researcher or made available by participants in virtual learning environments) and procedural and training evaluations (written in diaries, conversations in forums, chats, collaborative murals, and others). We analyzed these data to understand educational processes that are effective and significant to students. We read or watched the narratives, selecting the ones that were more significant during the process, transcribing them if necessary, and inserting them in a separate digital space (each researcher gathered them wherever they preferred, whether in text files, groups in chat applications, folders in the computer, or other similar spaces). The criteria for selecting the narratives was acceptance of participation in the research and narrative's contribution to the study, according to the researcher's analytical lenses.

Below, we highlight narratives from the two outreach programs mentioned above. For the complete research, other narratives were analyzed but could not be included here due to the length of the text and the framework of this work.

Preliminary Findings

We intended to systematize and evaluate the inventive uses of mobile devices in Brazilian teachers' routines, understanding pedagogical questions related to these uses. The new ways of learning present many challenges to the educational processes

and contemporary pedagogies, especially during the COVID-19 pandemic. We know technology alone does not solve all problems. We need to comprehend the ways that people use technologies in their routines to improve learning methodologies. We aimed to understand how professionals perceive mobile learning, especially in the emergence of authorship, autonomy, citizenship, accessibility, and student content production in the era of connectivity in Brazilian educational contexts. This can improve culturally situated mobile learning.

The educational and research experience presented specific apps for each activity, as shown in Fig. 1. Taking advantage of the increasing use of mobile phones, the proposal was Bring Your Own Device (BYOD), a trend in the area in which users take their own mobile phones to the dynamic. We took two tablets to the training, but they were not used by participants, as they always preferred to use their own.

Moving to the research field practice, we built teaching designs using apps. To understand Fig. 1 and comprehend the educational/research process, we organized Table 1, which describes the training and investigative strategies used.

Other activities and courses were developed during the program (Fig. 1). The activities were designed to be online and non-online tasks, students needed to have internet network access (mobile internet or other) to access the activities.

The narratives of the participants (Table 2) highlighted the importance of including apps in their training to provide real experiences with a practical eye for mobile learning. We also proposed activities using the participants' professional experiences (e.g., a biology teacher produced his evaluative activities about biology classes). Thus, the participants were inspired to create mobile experiences in their own pedagogical practices. During the hypermobility and ubiquitous education course, students participated in the Wiki of collaborative writing to create a Pedagogy of Hypermobility concept.

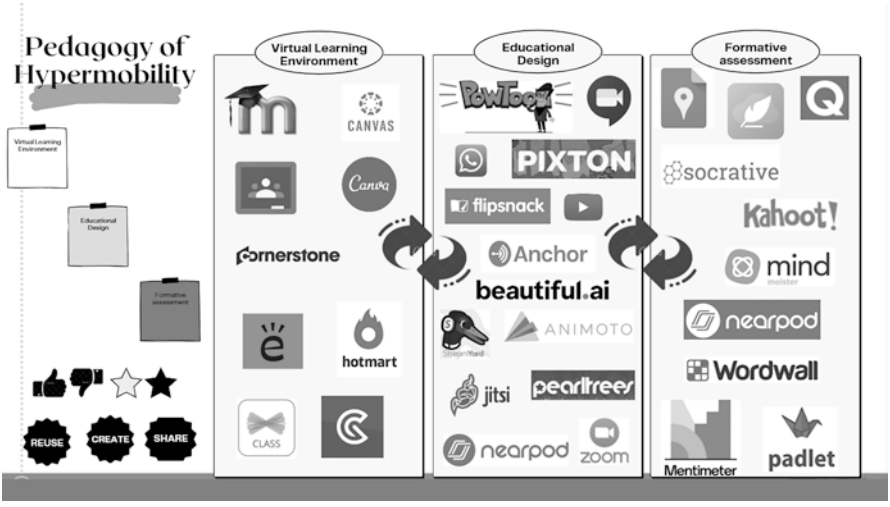

Fig. 1 Apps used during the training

Table 1 Training and investigative strategies

Overview of activities created during the outreach program: teacher training for online education		
Course	Activity	Apps
During the entire outreach program	Participants developed a life/educational narrative sharing their experiences during the outreach program.	Diaro.
Online education	Participants created word clouds about online education.	Word Cloud.
Hypermobility and ubiquitous education	Participants created Pedagogy of Hypermobility notion in the Wiki of collaborative writing.	Google Docs.
Multimedia resources	Participants created transmedia to produce courseware: Comics, memes, podcasts, videos, and storyboards.	Comic Strip It!, Anchor, Powtoon, Pixton, and Animoto.
Virtual learning environments	Students developed online courses.	Edmodo, Google Classroom, GoConqr, Seesaw Class, Pearltrees, and Symbaloo.

Table 2 Participant narratives

Narrative	Emphasis
"Pedagogy of Hypermobility, to me, is a pedagogy that works with the development of the subject, regardless of geographic location, concerning the content or desired information. Thus, it is possible to have instant access to content through the web."	Geographic location Instant access
"A pedagogy created in fluid spaces; it is an intersection from connection in time-space displacements in every routine context."	Fluid spaces Connection
"It is necessary to expand the internet infrastructure in all Brazilian regions."	Expand the internet infrastructure
"I believe that this pedagogy will allow an expansion between what is taught and what is learned. It is a new way to build knowledge, breaking the barriers and conservative limits of education and opening a unique space to create, reflect, and innovate."	Breaking educational limits
"Without the primary need of a steady space in the Pedagogy of Hypermobility, there is simultaneous interaction of many people in different places, transcending traditional teaching models and scholar ambiance."	Interaction Teaching models
"I believe it is important to think about educational practices around the city. It is a way to explore further when it comes to contextualizing the curriculum to students' reality. It is also a way to bring more meaning to education, to remember that culture is the way we live, and to value—instead of erasing or underestimating—students' daily experiences."	Education around the city Students' reality
"Through virtual environments, such as the Google Arts & Culture app, we can interact by adding different articles of our world knowledge. This platform is full of features that we can explore, such as the selfie function that allows the individual to have the face feature compared to some work" [work of art].	World knowledge

From the narratives and group constructions in the field, we highlight factors that teachers should consider when designing learning situations in mobile contexts: (1) deconstruction of geographic location and steady space, (2) instant access on the web, (3) fluid spaces, displacements in all routine contexts, (4) the battle to expand the internet access, (5) the creation of a new way to build knowledge, (6) the contextualization of the curriculum to students' reality, and (7) the expansion of world knowledge with applications.

Discussion

Some subsuming notions emerged from the field experiences, the narrative of participants, and theoretical references. I created these six subsuming notions based on my significant learning during the research-training in cyberculture. We considered the following six topics to analyze the Pedagogy of Hypermobility, mobile learning, and culturally situated practices for equity in Brazil.

1. **Education without walls**: The power of mobile learning allows educational processes to be conducted anywhere. The school is not the only possible place, as education can occur in different spaces around the city.
2. **Education in movement**: In mobile and ubiquitous computing, systems constantly interact with people in a distributed, dynamic, and interactive way. Wireless communication allows mobility between devices and educational processes in displacement, and teachers could use this.
3. **Access**: Uploading content on websites can help students, because they do not have to download them on their mobile phones. If it is not possible, light and responsive content can be created to not overload students' phones.
4. **Freeing education**: Inspired by Paulo Freire, we can help students think of problematization, oppression, and awareness of their position in the world, liberation, invention, and claim for better education conditions for all students.
5. **Personalized and contextualized information**: Computational systems are set and adapted to the users' needs, environment, preferences, and uses. Computational systems are aware of the context and many times that happens in a way that is unperceived by the user.
6. **Urban micronarratives in hypermobility**: Students can explore their creativity and reinvent their everyday life by appropriating the urban space. With their mobile phones in their hands, they can record, narrate their urban experiences, and share pedagogical experiences throughout the city. Students can write about urban experiences in a collective blog or develop a collaborative mapping on Google My Maps (Martins et al., 2021), for example.

Limitations

The limitations of the study are the low number of studies on mobile learning in the COVID-19 pandemic; the lack of knowledge of the research methodology in the North American context; and the short time for the study (four months, on average) demanding long-term research on upcoming opportunities.

Conclusion

During the doctoral study reported here, we were affected by the COVID-19 pandemic, and it changed all areas of our lives–especially the educational area. We lost our physical school space and gained educational processes mediated by digital technologies with substantial use of mobile devices by students. Hence, we were interested in exploring how educational environments could be improved to create culturally situated learning.

Based on analysis of the narratives and joint constructions, we reflected about the systematization of educational practices that promote mobile, ubiquitous, connected learning and teaching environments in different spaces, which come from different knowledge sources regarding the emergence of teaching, research, authoring, and knowledge production devices in hypermobility.

Notably, the production of narratives about experiences with educational practices using apps is a challenge, especially due to the difficulties associated with internet access in Brazil. Mobile learning allows educational uses in the palm of our hands, such as data collection for research, space interventions, virtual or amplified reality, content production, collaborative learning, among others. Such actions can happen instantly and are not necessarily attached to a given physical space. For this reason, we must improve our pedagogy to create the best environment for our students and minimize social inequality and educational exclusion.

References

Al-Emran, M. (2021). Mobile learning during the era of COVID-19. *Revista Virtual, 61*, 1–2. https://doi.org/10.35575/rvucn.n61a1

Alves, N. (2011). Everyday life in schools. In W. F. Pinar (Ed.), *Curriculum studies in Brazil*. International and Development Education. Palgrave Macmillan.

Ardoino, J. (2003). *Para uma pedagogia socialista* [Towards a socialist pedagogy]. Editora Plano.

CGI.BR. (2020a). *Pesquisa sobre o uso das tecnologias de informação e comunicação nos domicílios brasileiros – TIC Domicílios* [Research on the use of information and communication technologies in Brazilian residences – ICT households 2019]. https://cetic.br/media/analises/tic_domicilios_2019_coletiva_imprensa.pdf

CGI.BR. (2020b). *Painel TIC Covid-19, pesquisa sobre o uso da internet no Brasil durante a pandemia do novo Coronavírus. 3ª edição: ensino remoto e teletrabalho* [Panel TIC Covid-19,

research on internet use in Brazil during the new Coronavirus pandemic. 3rd edition: Remote learning and telework]. https://cetic.br/media/docs/publicacoes/2/20201104182616/painel_tic_covid19_3edicao_livro%20eletr%C3%B4nico.pdf

de Certeau, M. (2011). *Practice of everyday life*. University of California Press.

Farias, J., & Silva, R. (2020). Mobile learning (aprendizagem em movimento): Os dispositivos móveis como ferramentas facilitadoras no espaço escolar [Mobile learning (learning on the move): Mobile devices as facilitating tools in the school space]. *Revista Prometeu*, 6. http://lte.ce.ufrn.br/prometeu/revistas/revista_2020/2.pdf

Lévy, P. (1999). *Cibercultura* [Cyberculture]. Editora 34.

Martins, V., Santos, E., & Correia, A.-P. (2021). Google My Maps as a conduit to culturally rich learning experiences. In M. Simonson & D. J. Seepersaud (Eds.), *43rd annual proceedings of association for educational communications and technology: Volume 2 – Selected papers on the practice of educational communications and technology* (pp. 406–414). Association for Educational Communications and Technology (AECT).

Pebriantika, L., Wibawa, B., & Paristiowati, M. (2021). Adoption of mobile learning: The influence and opportunities for learning during the Covid-19 pandemic. *International Journal of Interactive Mobile Technologies, 15*. https://doi.org/10.3991/ijim.v15i05.21067

Pegrum, M. (2014). *Mobile learning: Languages, literacies, and cultures*. Macmillan.

Santaella, L. (2007). *Linguagens líquidas na era da mobilidade* [Liquid languages in the age of mobility]. Paulus.

Santos, E. (2019). *Pesquisa-formação na cibercultura* [Research-training in cyberculture]. EDUFPI.

Towards Culturally Inclusive Dialogue in Online Learning

Barbara M. Hall and Nandita Gurjar

Goals for Culturally Inclusive Dialogue

Dialogue is productive talk for sharing, evaluating, and building ideas collectively with reasoning, justifications, elaborations, and evidence (Hall, 2016; Major et al., 2018). Dialogue is at the heart of the meaning-making process, and therefore dialogue is at the center of learning (Lim, 2004; Mortimer & Scott, 2003). From a socio-cultural perspective (Vygotsky, 1978), dialogue is seen as "a means to transform social relations in the classroom, and to raise awareness about relations in society at large" (Shor & Freire, 1987, p. 11). The intent of the dialogue is to understand the knowledge and perspectives of one another with the possibility of reconciliation (Michaels & O'Connor, 2012; Major et al., 2018).

Vygotsky (1978) believed human development is rooted in culture and society. The social construction of knowledge happens within a sociocultural context. The scaffolding in the zone of proximal development connects prior knowledge to new knowledge. The tools and sign systems (language, number systems, writing) mediate human-environment interaction. "Internalization of culturally produced sign systems brings about behavioral transformations" (Vygotsky, 1978, p. 7). Sociocultural theory (Vygotsky) posits that direct communication and indirect cultural influences impact learning and the meaning-making process. Hence,

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connections between our thought processes and outward social interaction form the basis of learning. Learning in a sociocultural framework is interactive, distributed, and contextual (Gunawardena et al., 2019). Culturally inclusive dialogue happens in an interactive, sociocultural setting with distributed cultural wisdom and unique individual gifts that add value to the co-construction of meaning.

Developing an understanding of values, beliefs, and linguistic differences within and across cultures is necessary (Morong & DesBiens, 2016). To understand one another, we must check our social, cultural, and language assumptions (Gunawardena et al., 2019). Social assumptions may be related to one's socioeconomic status, marital status, family structure, access to resources, and support system. Cultural assumptions attribute specific traits to members of a race, ethnicity, or country resulting in stereotypes. Similarly, language assumptions may get reflected in accent or regional dialect as indicative of an individual's intellect, education, or position in society. Another assumption is that all language structures are the same where literal translations are possible. These assumptions are inaccurate and inhibit the development of culturally inclusive dialogue.

The goal of culturally inclusive dialogue in online learning is to develop community. Whereas a group may come together for the members' own self-defined purposes or individual goals, a community connotes a feeling of connectedness, fellowship, and care to achieve a common goal (Gunawardena et al., 2019). A community develops empathy, a necessary characteristic of our evolving global society seeking enhanced cultural awareness within businesses, organizations, and society at large (Matthew et al., 2017). Individuals in a community listen to, understand, and check to confirm co-constructed meaning-making. The pursuit of community involves building relationships to see the common humanity while valuing the differences. "Empathy is about finding the echoes of another person in yourself" (Hamid, as cited in Matthew et al., 2017, p. 486).

Culturally inclusive dialogue honors and leverages the uniqueness of the individual as well as the wealth and wisdom of the origin of their heritage. Dialogue leverages the distributed, cross-cultural cognition to enrich and transform learning. Valuing the unique contributions of others and authentic, open communication creates a comfortable social space and a sense of community in online learning (Gurjar, 2020; Hall, 2014) necessary for culturally inclusive dialogue. In a framework of cultural inclusivity, we approach dialogue with humility and empathetic listening to understand. Such dialogue focuses on clarity of communication, as language and culture are inextricably connected, just as syntax of the native language, values, and beliefs influence thinking and communication in individuals (Edmundson, 2007; Gunawardena et al., 2019; Trompenaars & Hampden-Turner, 1998). For example, cultural nuances in idioms require understanding of not only the target language, but also the cultural context with the values, beliefs, and customs of that culture. Therefore, linguistic expressions are difficult to translate without losing nuanced meaning. Another consideration is silence; continuous chatter is an obstacle to genuine listening. Culturally inclusive

dialogue includes deliberate and intentional acts of silence. Lastly, embracing cultural gifts and sharing cultural wisdom while seeking common humanity is something to strive for in culturally inclusive dialogue. Community, equity, and inclusivity are all elements of a wisdom community (Gunawardena et al., 2019) in which individual members grow through collaboration and communication while working towards shared purposes.

Interrelationships of Language and Culture

Language and culture are interconnected due to the social origin of thinking and language (Vygotsky, 1978). Consideration for negotiating interactions in another language is necessary for culturally inclusive dialogue. The connotative meaning of words in context may not be intuitive to other language learners and stakeholders as those meanings are to native speakers. Idioms are highly culturally specific, relying on the cultural context that may not be understood in another cultural context. Additionally, written discourse may not be natural for indigenous cultures (McLaughlin, 2001) based on their oral traditions. Our native cultures with their customs, traditions, values, beliefs, and practices shape our thinking and language (Trompenaars & Hampden-Turner, 1998). Our native language and discourse influence *how* we communicate those ideas, with *whom*, and under what *context*. Syntax of the native language influences our sentence structure and communication in another language. There are also several regional and national varieties of languages that have evolved due to colonization and modernization across the world. The intersectionality of our multiple cultural identities, including multilingualism, represents a continuum on which each individual's unique layers of identities exist. While some of our cultural identities are dominant in one setting, other identities may be dominant in other settings.

Translanguaging and code-switching within dialogue allow inclusive participation based on individual linguistic needs. Translanguaging is "the process of making meaning, shaping experiences, gaining understanding and knowledge through the use of two languages" (Baker, 2011, p. 288). Code-switching is a way of translanguaging by using both languages simultaneously. Proficient bilingual and multilingual individuals express their identity through translanguaging. Allowing translanguaging in a course makes the course inclusive for global students from various ethnicities, cultures, and lived experiences because inclusion "fosters a sense of belonging to a community— feeling appreciated for one's unique characteristics, perspectives, contributions, and ways of thinking [and] comfortable sharing their ideas, their identities, cultures, languages, and ways of seeing the world" (Gunawardena, 2020, p. 7). Specifying communication protocols and support for guiding interaction is important for the design of culturally inclusive

dialogue because language is a critical factor in the negotiation and co-creation of meaning (Gunawardena, 2020; Lim, 2004; Vygotsky, 1978).

One such support is the Universal Design for Learning (UDL) framework (Barajas & Higbee, 2003; Rose & Meyer, 2000). Aligning the discussion design with the principles of UDL supports culturally inclusive dialogue through equitable access. Equity means that each learner is given the resources they need to ensure an equitable outcome (UNESCO, 2017). Open-ended discussion prompts focusing on global issues tap into multiple cultural funds of knowledge. Leveraging cultural heritage with tangible and intangible cultural elements has the advantage of representation for social justice and creating a community with a sense of belonging for equity. Discussion prompts may be evaluated for cultural nuances and subtleties of meaning situated in a particular cultural context with multiple frames of reference. One such frame is Gay's (2010) culturally responsive teaching, which teaches "to and through the strengths of the students" (p. 31) through the following characteristics: multidimensional, comprehensive, empowering, transformative, emancipatory, and validating.

While the above issues highlight the multifaced nature of designing discussions for cultural inclusivity, there is no comprehensive tool widely available for supporting instructional designers and educators across content domains. Based on this gap, we propose a matrix suggesting ways discussion designers might leverage the affordances and mitigate the constraints of the local context identified through the needs assessments and learner analyses of the design process.

Culturally Inclusive Dialogue Design Matrix (CIDDM)

The Culturally Inclusive Dialogue Design Matrix (CIDDM) is a design tool for instructional designers and educators as they aim for community, equity, and social justice through culturally inclusive dialogue. A brief overview of the CIDDM will be helpful in its application.

The CIDDM is built on two apparent dichotomies: (1) affordances and constraints and (2) promoters and inhibitors. In truth, these are false dichotomies because each is closer to a continuum. Creating the CIDDM with the nuances of multiple continua would make the tool even more complex, so the appearance of dichotomies is used. The matrix can be divided down the middle, creating two symmetrical halves of the tool. The left half focuses on affordances while the right half focuses on constraints. Readers may be more familiar with the concept of constraints, though a brief explanation of affordances might be helpful.

The term *affordance* was coined in 1966 by ecological psychologist James Gibson in reference to human perceptual systems. In Gibson's (1979) definition, he defines *affordances* using the words *offers, provides*, and *furnishes* (p. 127). We can learn, Gibson asserts, "how to use things and perceive their uses" (p. 134). The word

affordances has escaped the bounds of ecological psychology and has current usage in many fields. Some readers, for example, will recognize the word from user experience design. Our meaning of *affordances* aligns with Gibson's original intention: The affordance of a thing is what an individual perceives its use to be based on what the thing offers, provides, or furnishes. In the CIDDM, the individual is the designer, and the things are the needs assessments and learner analyses conducted as part of the design process.

With the understanding of affordance, we can return to the form of the CIDDM. The outermost columns of each half of the CIDDM reflect how designers might leverage the affordances and mitigate the constraints of the needs assessments and learner analyses conducted as part of the design process. Moving from the outermost columns inward, the remaining columns of the CIDDM are grouped as affordances and constraints of the local context. Understanding *local* as geographic is probably the most familiar sense of the term, though *local* could be interpreted differently based on the perceptions of the individuals. Further differentiated under local context are the promoters and inhibitors of inclusive dialogue characterized as social, political, economic, and cultural ("SPEC") contexts. These terms are explained at the bottom of the matrix. Designs including the diversity of SPEC contexts on the left half of the CIDDM are likely to promote culturally inclusive dialog, while designs reflecting the more restrictive SPEC contexts on the right half of the CIDDM are likely to inhibit culturally inclusive dialogue because fewer perspectives are included in scenarios or case studies, for example, and learners may feel excluded, judged, or stereotyped. The matrix follows.

Culturally Inclusive Dialogue Design Matrix (CIDDM)

Designers leveraging the affordances[a]	Affordances of the local context				Constraints of the local context				Designers mitigating the constraints[a]
	Promoters of Inclusive Dialogue				Inhibitors of Inclusive Dialogue				
	Social[c]	Political[d]	Economic[e]	Cultural[f]	Social[c]	Political[d]	Economic[e]	Cultural[f]	
Tangible sources of cultural capital to create a community and to learn across cultures	Supportive familial and social systems	Democratic and less efficient (non-bureaucratic) approach to policy development and implemen-tation	Equity of infrastructure	*Movable*: Paintings, Sculptures, Coins, Manuscripts *Immovable:* Monuments and Archaeological sites Architecture *Underwater:* Shipwrecks, Underwater ruins Cultural heritage as in arts, craft, music, movies and so on.	Unsupportive familial and social systems	Undemocratic and bureaucratic approach to policy development and implementation	Inequity of Infrastructure	Destroyed, contested, and stolen artifacts and sites	In-depth understanding of local cultural contexts Providing structures of social support to learners (e.g. peer mentoring) Offering choice, flexibility, and multiple pathways of genuine support. Utilizing learner- developed OERs.

Intangible[b] sources of cultural capital to create a community and to learn across cultures	Challenging the status quo Equality of power based on gender, race, ethnicity, age, class, and status	Balance of individual and government rights & responsi-bilities	Access to equitable economic opportunities within the same social-cultural communities Equality & equity of opportunity without class, caste, or gender constraints. Flexible and equitable gender roles and responsibilities Majority of the population is literate Equitable access to quality education (School types within same local context (public/govt; private)	Wisdom sharing such as proverbs and idioms specific to the culture *Cultural Wisdom:* Festivals Customs Traditions Oral traditions Performing arts Social practices Rituals[a] Festive Events[a] Folklore: Myths, Legends, Folktales Knowledge and practices concerning nature and the universe to produce traditional crafts	Reinforcing the status quo Inequality of power based on gender, race, ethnicity, age, class, and status	Imbalance of individual and government rights & responsibilities	Presence of economic disparities within the same socio-cultural context Inequality and inequity of opportunity with class, caste, or gender constraints. Rigid gender roles and responsibilities Majority of the population may not be literate. Inequitable access to quality education (School types within same local context (public/govt; private)	Not Leveraging cultural wisdom through proverbs and idioms	Cultural Norms and Expectations Understand cultural nuances Systemic needs assessment throughout the design process to understand social conventions and to identify whose voices may be suppressed due to the power imbalance. Designers reflecting on how power imbalance can be disrupted. Leveraging cultural strengths for motivating participation. Utilizing multiple ways of expression in multiple modalities Giving individuals options to share to the extent they feel comfortable.

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Designers leveraging the affordances[a]	Affordances of the local context				Constraints of the local context				Designers mitigating the constraints[a]
	Promoters of Inclusive Dialogue				Inhibitors of Inclusive Dialogue				
	Social[e]	Political[d]	Economic[e]	Cultural[f]	Social[e]	Political[d]	Economic[e]	Cultural[f]	
Using Maslow's Hierarchy of Needs to understand and address learner needs	Maslow's hierarchy related to sense of belonging is met	Effective government-sponsored programs that address physiological and safety needs of Maslow's hierarchy	Maslow's hierarchy related to physiological and safety needs are met	Cultural identity is valued in support of self-esteem and self-concept	Maslow's hierarchy related to sense of belonging is NOT met	Absence or ineffective government-sponsored programs to address physiological and safety needs of Maslow's hierarchy	Maslow's hierarchy related to physiological and safety needs are NOT met	Cultural identity is NOT valued in support of self-esteem and self-concept	Creating a sense of belonging for every individual. Create a supportive community Value cultural identities Create a safe, judgement-free zone. Create a comfortable, inclusive social space. Embrace mistakes as opportunities for growth to cultivate a safe, risk-free learning environment.

Utilize common humanitarian issues for shared vision and goals (e.g., Global Goals)	Addressing the Global Goals) such as Zero Hunger, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent work and economic growth,	Global thinking and perspective sharing	Exploring root causes of economic inequities and inequalities (e.g., poverty)	Intercultural appreciation, humility, and empathy	Avoiding or being unaware of the Global Goals	Nationalism and inability to acknowledge others' perspectives	Indifference or inability to explore root causes of economic inequities and inequalities (e.g., poverty)	Lack of intercultural appreciation, humility, and empathy	Communicating expectations regarding class norms. Cultivating empathy and intrinsic motivation towards global causes. Modeling humility Demonstrating intercultural appreciation through music, movies, food, and clothing, etc. Creating a community with shared vision.

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Designers leveraging the affordances[a]	Affordances of the local context				Constraints of the local context				Designers mitigating the constraints[a]
	Promoters of Inclusive Dialogue				Inhibitors of Inclusive Dialogue				
	Social[c]	Political[d]	Economic[e]	Cultural[f]	Social[c]	Political[d]	Economic[e]	Cultural[f]	
Celebrate Differences and see our common humanity to humanize people from other cultures.	Validating intersectionality Society where women are empowered Positive Attitudes and Perceptions towards differences	Respectful discourse around multiple political viewpoints Peaceful protests & social activism	Economic equity among social classes and castes Access to equitable economic opportunities within the same social-cultural communities	Valuing linguistic diversity (e.g., translan-guaging)	Invalidating intersectionality Patriarchy and marginalization of women Negative attitude and perceptions towards differences	Divisiveness; inability to sustain respectful discourse around multiple political viewpoints	Economic inequality due to class & caste dominance Lack of access to equitable economic opportunities within the same social-cultural communities	Constraining linguistic diversity and (e.g., rigidity for dominant language; constraining regional dialects and the use of translan-guaging)	Celebrating the common humanity while valuing the differences. Celebrating the uniqueness of individuals and their contributions. Providing options and choices. Empower and validate through valuing the identity and contributions of the marginalized.

Use culturally relevant visuals & instructional materials	Valuing the Lived Experiences of individuals to learn and share Discipline-specific case studies situated within different social groups	Oral history interviews Content analysis of political cartoons or media Discipline-specific case studies situated within different political systems	Oral history interviews of elders and community members Discipline-specific case studies situated within different economic systems	Oral storytelling, Movies, music, customs, traditions, and ways of meaning-making in the world Language proficiency Discipline-specific case studies situated within different cultural systems	Adverse Life Experiences not dealt with or continued negative impact of trauma	Lack of access to individuals for oral history interviews Fear of retribution for political views/ lack of freedom to express political views openly	Lack of access to individuals, materials, or media	Not using culturally relevant materials or using standardized materials not accounting for culture inhibition in sharing lived experiences due to being shy or afraid of judgment Uncomfort-able expressing speaking out due to cultural upbringing Lack of language proficiency	Addressing representation and inclusivity Inclusive mores and norms Understanding the values and beliefs of the community Providing multiple options of expression and the extent to which individuals share. Encourage diversity of linguistic expression.

[a]Affordances and constraints of needs assessments and learner analyses
[b]Intangible elements can manifest in tangible elements of culture
[c]Social: social systems and processes
[d]Political: political system and government policy (e.g., educational policy)
[e]Economic: economic systems (e.g., inequalities due to social inequities or policies)
[f]Cultural: cultural norms & traditions

Facilitation Strategies That Build Community

Collaboration must be taught, and there are certain design considerations for developing understanding and problem solving (Hall, 2014). Effective facilitation strategies both teach and model skills for collaboration through perspective-taking, negotiation of meaning, and building on one another's ideas. To teach and model such skills in their course facilitation, instructors must also understand the characteristics of culturally inclusive dialogue. How can we design and facilitate culturally inclusive conversations if we are unfamiliar with their characteristics and purposes? Gaining such familiarity is the first step to effective facilitation. Having the cultural humility (Tervalon & Murray-Garcia, 1998) to learn more about other cultures from the participants of that culture is a proactive approach for culturally inclusive dialogue.

Internalized socio-cultural messages may impact dialogue in online learning. While care is necessary in avoiding stereotypes based on Hofstede's (1980) work, particularly given the recognition of the intersectionality of cultural identities, there is still value in understanding the influences of individual and collectivist orientations on learning through dialogue. A related example is the value of errors (Edmundson, 2007). While some learners may embrace errors as growth opportunities, others may try to minimize errors. The focus on avoidance of errors may inhibit participation because it raises the individual's affective filter (Dulay & Burt, 1977; Krashen, 1981). Affective filters are the socio-emotional or affective variables that impact learning such as motivation, self-confidence, self-concept, and anxiety. Lowering the affective filter is achieved through comprehensible input (Krashen, 1981) and other measures (particularly multimodal ones) for creating a sense of belonging in the community and a risk-free learning environment.

Individuals may bring socially embedded power structures that often operate at a subconscious level to impact dialogue. Differences in gender, age, position, and other characteristics create imbalances of power that inhibit culturally inclusive dialogue and equitable learning. For example, tacit deference for elders shapes the language and behavior of learners who developed in a cultural context in which one accepts without questioning the position of an elder, as questioning may be considered argumentative and rude. Teachers are revered in some cultures and learners from such cultural contexts may feel hesitant in asking questions or reaching out to the instructor. Collaboration has to be taught and posting specific communication protocols may help as well as having peer mentors that can guide and assist as needed. Another example is gender identity, which may impact discourse for learners coming from primarily male-dominant societies. For those instructors or peers unfamiliar with this cultural context, female learners may appear shy, and such learners may not assert their instructional needs. Providing multiple options to assert their voice through journaling, art, and other media to create grounding and a sense of community promotes trust, sharing, understanding for more comfortable conversations (Hall, 2014). Through these and other specific strategies, the goal for facilitating culturally inclusive dialogue is to honor the learner's multiple identities (Woodley et al., 2017). In both design and facilitation of the conversation, draw on

multiple cultural heritages using tangible and intangible cultural elements. Validate and leverage learners' prior knowledge based on their lived experiences with their unique intersectionality of cultural identities.

Conclusion

Capitalizing on diversity requires prioritizing inclusivity. Understanding values, beliefs, and linguistic differences within and across cultures is a worthy goal to foster community, equity, and social justice. Internalized sociocultural messages may impact dialogue in online learning. Given the importance of dialogue in learning based on sociocultural theory, designers and educators are wise to attend to the design and facilitation of culturally inclusive dialogue. The goal of culturally inclusive dialogue in online learning is to develop community.

The co-construction of meaning occurs through specific knowledge-building processes influenced by our cultural identities. The intersectionality of our multiple cultural identities represents a continuum on which each individual's unique layers of identities exist. While some of our cultural identities are dominant in one setting, other identities may be dominant in other settings. As culture is a multidimensional complex construct, an awareness of the layers of cultural identities an individual brings to the learning situation is paramount to avoid oversimplification and stereotypes.

In both design and facilitation of the conversation, designers and educators can draw on multiple cultural heritages using tangible and intangible cultural elements. Validate and leverage learners' prior knowledge based on their lived experiences with their unique intersectionality of cultural identities. Open-ended discussion prompts focusing on global issues tap into multiple cultural funds of knowledge. Leveraging cultural heritage with tangible and intangible cultural elements has the advantage of representation for social justice and creating a community with a sense of belonging for equity. Discussion prompts may be evaluated for cultural nuances and subtleties of meaning situated in a particular cultural context with multiple frames of reference.

These concepts culminated in the Culturally Inclusive Dialogue Design Matrix (CIDDM) to support instructional designers and educators as they aim for community, equity, and social justice through culturally inclusive dialogue.

References

Baker, C. (2011). *Foundations of bilingual education and bilingualism* (5th ed.). Multilingual Matters.

Barajas, H. L., & Higbee, J. L. (2003). Where do we go from here? Universal design as a model for multicultural education. In J. L. Higbee (Ed.), *Curriculum transformation and disability: Implementing universal design in higher education* (pp. 285–290). Center for Research on Developmental Education and Urban Literacy, General College, University of Minnesota.

Dulay, H., & Burt, M. (1977). Remarks on creativity in language acquisition. In M. Burt, H. Dulay, & M. Finnochiaro (Eds.), *Viewpoints on English as a second language* (pp. 95–126). Regents.

Edmundson, A. (2007). The cultural adaptation process (CAP) model: Designing e-learning for another culture. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 267–290). Information Science Publishing. https://doi.org/10.4018/978-1-59904-301-2

Gay, G. (2010). *Culturally responsive teaching: Theory, research, and practice* (2nd ed.). Teachers College.

Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton Mifflin Harcourt.

Gunawardena, C. N. (2020). Culturally inclusive online learning for capacity development projects in international contexts. *Journal of Learning for Development, 7*(1), 5–30. https://jl4d.org/index.php/ejl4d/article/view/403

Gunawardena, C., Frechette, C., & Ludmila, L. (2019). *Culturally inclusive instructional design: A guide to building online wisdom communities*. Routledge.

Gurjar, N. (2020). Leveraging social networks for authentic learning in distance learning teacher education. *TechTrends, 64*(4), 666–677. https://doi.org/10.1007/s11528-020-00510-7

Hall, B. M. (2014). Designing collaborative activities to promote understanding and problem solving. *International Journal of e-Collaboration, 10*(2), 55–71. https://doi.org/10.4018/ijec.2014040104

Hall, B. M. (2016). Intersubjectivity. In S. L. Danver (Ed.), *Encyclopedia of online education* (pp. 599–602). SAGE.

Hall, B. M. (2019). Learning through asynchronous discourse: An interdisciplinary perspective on intersubjectivity. In S. Carliner (Ed.), *Proceedings of E-learn: World conference on E-learning in corporate, government, healthcare, and higher education* (pp. 1100–1111) Association for the Advancement of Computing in Education.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. SAGE.

Krashen, S. (1981). *Second language acquisition and second language learning*. Pergamon Press.

Lim, T. (2004). Towards an Asian model of face. *Human Communication, 7*(1), 53–66.

Major, L., Warwick, P., Rasmussen, I., Ludvigsen, S., & Cook, V. (2018). Classroom dialogue and digital technologies: A scoping review. *Education Information Technology, 23*, 1995–2028. https://doi.org/10.1007/s10639-018-9701-y

Matthew, T., Williams, G., Yanchar, S., & McDonald, J. (2017). Empathy in distance learning design practice. *TechTrends, 61*, 486–493. https://doi.org/10.1007/s11528-017-0212-2

McLaughlin, C. (2001). Inclusivity and alignment: Principles of pedagogy, task, and assessment design for effective online learning. *Distance Education, 22*(1), 7–29. https://doi.org/10.1080/0158791010220102

Michaels, S., & O'Connor, C. (2012). *Talk science primer*. TERC.

Morong, G., & DesBiens, D. (2016). Culturally responsive online design: Learning at intercultural intersections. *Intercultural Education, 27*(5), 474–492. https://doi.org/10.1080/14675986.2016.1240901

Mortimer, E., & Scott, P. (2003). *Meaning making in secondary science classrooms*. Open University Press.

Rose, D. H., & Meyer, A. (2000). Universal design for learning: Associate editor column. *Journal of Special Education Technology, 15*(1), 67–70.

Shor, I., & Freire, P. (1987). What is the "dialogical method" of teaching? *Journal of Education, 169*(3), 11–31.

Tervalon, M., & Murray-Garcia, J. (1998). Cultural humility versus cultural competence: A critical distinction in defining physician training outcomes in multicultural education. *Journal of Health Care for the Poor and Underserved, 9*(2), 117–125. https://doi.org/10.1353/hpu.2010.0233

Trompenaars, A., & Hampden-Turner, C. (1998). *Riding the waves of culture: Understanding cultural diversity in global business* (2nd ed.). McGraw-Hill.

UNESCO. (2017). *A guide for ensuring inclusion and equity in education*. Author. https://unesdoc.unesco.org/ark:/48223/pf0000248254

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Woodley, X., Hernandez, C., Parra, J., & Negash, B. (2017). Celebrating difference: Best practices in culturally responsive teaching online. *TechTrends, 61*, 470–478. https://doi.org/10.1007/s11528-017-0207-z

Part II
Race, Gender, Disability, and Intersectionality

Ableism Versus Inclusion: A Systems View of Accessibility Practices in Online Higher Education

Rita Fennelly-Atkinson

Online higher education is struggling to adapt to changing expectations in how students with disabilities are supported. Historically, access to education has been based on accommodation practices rooted in ableism, a discriminatory preference for abled bodies. Impacted by shifting societal views on disability, institutions are now expected to adhere to accessible and inclusive educational practices. Despite conflicting case law, the consensus is that postsecondary institutions are expected to ensure their online content is accessible (Burke et al., 2016; Cullipher, 2017; Iglesias et al., 2014; McAfee & Taft, 2019). Currently, accessibility represents a design challenge in transforming online education from ableist to inclusionary paradigms of practice. To address this challenge, the beliefs underpinning ableism and inclusion will be examined. The manifestation of belief into practice within online education will be explored from a systems perspective, focusing on how students with disabilities are provided accommodations and access.

Defining Ableism and Inclusion

Rooted in other disciplines, *ableism*, *inclusion*, and *accessibility* have varied meanings. To understand the application within online higher education, the historical implications of these terms and their current evolution will be explored.

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Ableism is rooted in the belief that able bodies and minds are superior to disabled ones. Dolmage (2017) described this as assigning positive value to abled bodies. Consequently, disabled bodies are stigmatized and construed negatively (Dolmage, 2017). Ableism is expressed in harmful behaviors towards people with disabilities. Ableist stereotypes and prejudices ultimately lead to discriminatory behaviors (Bogart & Dunn, 2019).

Inclusion is a concept taking many forms. At a basic level, inclusion is the policy or practice of integrating and involving people, particularly those marginalized or discriminated against, into communities, organizations, and societal processes (Dictionary.com, 2021). The U.S. Department of State (2021) asserts that people with disabilities have a right "to non-discrimination, access, equality of opportunity, inclusion, and full participation in society."

Like inclusion, the term *accessibility* is fundamentally about access. The U.S. Department of Justice Civil Rights Division (2009) lists a slew of federal legislation that affords people with disabilities specific rights and access to physical and digital spaces, education, technology, and housing. However, accessibility is now imbued with a technological orientation due to the rise of the internet as a place and method to conduct activities and share information. As a method of designing for people to meaningfully navigate, understand, perceive, interact with, and contribute to online content and environments, accessibility now encompasses the ability to access and make use of websites, hardware, software, technology, and content (Culp et al., 2005; Huss & Eastep, 2016; Web Accessibility Initiative & World Wide Web Consortium, 2019). All considered, accessibility means higher education institutions are required to provide access to all programming and services, including those online, in a manner allowing all students to benefit.

A Systems View of Ableism and Inclusion in Higher Education

With the meaning of these concepts established, they can be considered through a systems perspective by how they interact at the institutional level. Moore and Kearsley (2012) stated that distance education is a system that affects and is affected by its environment. As a subset of this system, online education includes course delivery and development, program and department curriculum, and support for administration, student academics, and instructors (Hemphill et al., 2019). Tamim (2020) categorized these facets of online education into three subsystems: macrolevel practices based on theoretical perspectives, mesolevel infrastructure and management, and microlevel instructional practices and learner behaviors. As a complex and multifaceted system, online education adapts and evolves based on internal and external pressures, as shown in Fig. 1.

Through an analysis of the online education components, the subsystems can be further divided into Warr et al.'s (2020) Five Spaces for Design in Education. The interconnected facets of the institutional experience can be represented as components of a system, as shown in Fig. 2. Theoretically, a macrolevel change in culture should elicit mesolevel changes to infrastructure and the instructional experience. Likewise, these changes should result in microlevel practices and behaviors. By amalgamating Tamim's (2020) and Warr et al.'s (2020) associated views on

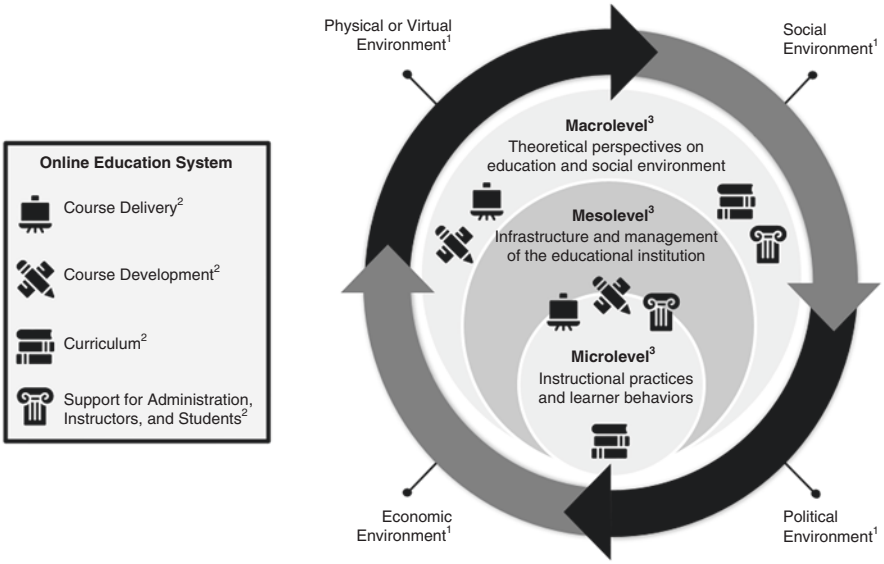

Fig. 1 Representation of online education as a system
Note. This figure depicts the conceptual elements of distance education systems, particularly online ones, and how they are related.
1. Concept from "Distance education: A systems view of online learning" by M. Moore, and G. Kearsley, 2012
2. Concepts from "Improving completion in online education systems: An application of systems thinking" by H. Hemphill, L. Hemphill, and R. Runquist, 2019, *Learning, Design, and Technology*, doi: 10.1007/978-3-319-17727-4_104-1
3. Concepts from "Analyzing the complexities of online education systems: A systems thinking perspective" by S. Tamim, 2020, *TechTrends*, doi: 10.1007/s11528-020-00538-9

educational systems, it is easier to understand how beliefs manifest into institutional procedures impacting individual behaviors and practices.

From a systems perspective, the concepts of ableism and accessibility are firmly situated in the macrolevel of culture. Ultimately, the beliefs upon which online higher education institutions are founded will determine whether their practices are inclusive and accessible. A recent study found institutional practices are one of the primary contributors to accessible instruction (Fennelly-Atkinson, 2021). This systems view can be used to analyze how students with disabilities are accommodated in their online education experiences.

A Systems View of Addressing Disability Within Online Higher Education

Socially, the way disability is viewed has shifted dramatically since students with disabilities were first welcomed into higher education. The medical and social models of disability will be reviewed in the context of their impact on accommodation and accessibility practices in higher education.

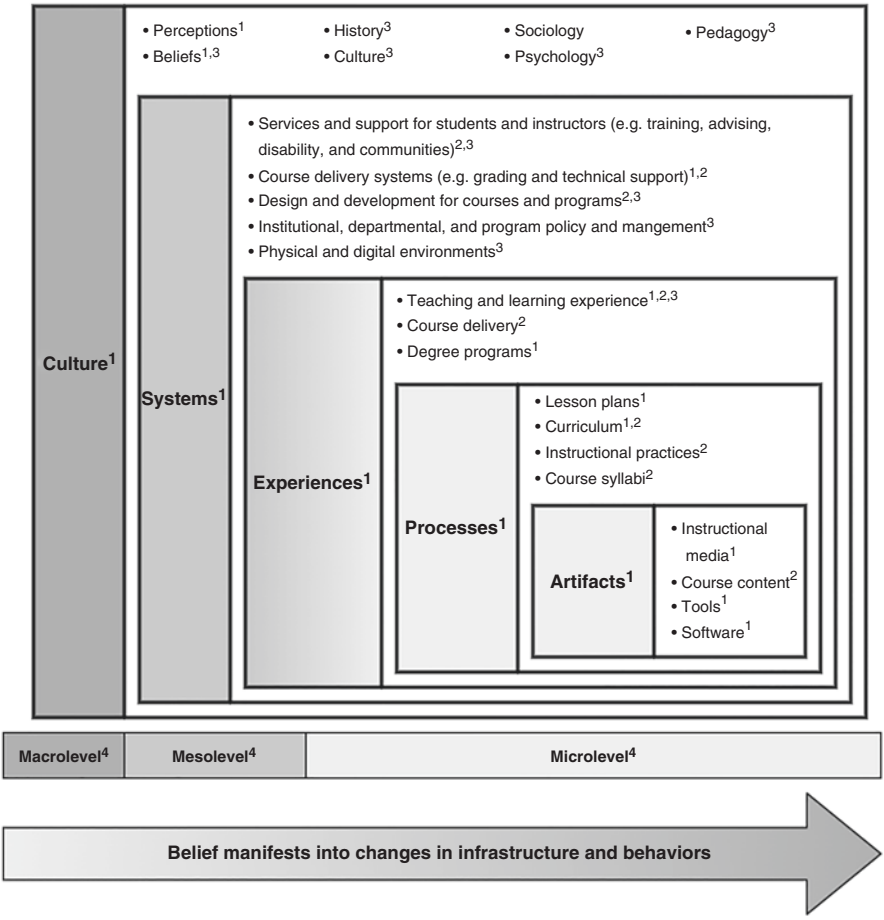

Fig. 2 Integrating the Five Spaces of Design in Education to the Systems View of Online Education
Note. This diagram showcases how the systems regarding distance education, online education, and the Five Spaces of Design in Education are holistically related to one another from a systems perspective.
1. Concept from "Designing theory" by M. Warr, P. Mishra, and B. Scragg, 2020, *Educational Technology Research and Development*, doi: 10.1007/s11423-020-09746-9. Copyright 2020 by Association for Educational Communications and Technology
2. Concepts from "Improving completion in online education systems: An application of systems thinking" by H. Hemphill, L. Hemphill, and R. Runquist, 2019, *Learning, Design, and Technology*, doi: 10.1007/978-3-319-17727-4_104-1
3. Concepts from "Distance education: A systems view of online learning" by M. Moore, and G. Kearsley, 2012
4. Concepts from "Analyzing the complexities of online education systems: A systems thinking perspective" by S. Tamim, 2020, *TechTrends*, doi: 10.1007/s11528-020-00538-9

Accommodations and the Medical Model of Disability

The issue of access for students with disabilities is based on how society has treated disability. For most of the twentieth century, the prevailing medical model has cast disability as an impairment or medical diagnosis (Andrews et al., 2019; Siebers, 2013). This model promotes ableism, impacting how institutions handle disability within the educational space. The medical model is linked to the ADA process of expecting students to disclose their disability to request and receive accommodations (Bogart & Dunn, 2019; Toutain, 2019). This process represents two challenges at the student and institutional levels highlighting how ableism translates into the student experience.

Disclosure of a disability is one of the primary obstacles with which students are presented. Several studies have revealed only a small percentage of students disclose their disability status to institutions due to issues such as stigma, discrimination, lack of knowledge about the accommodation process, labeling, stereotypes, and intermittent need for supports (Gabel & Miskovic, 2014; Grimes et al., 2017; Lindsay et al., 2018; McGregor et al., 2016; Newman et al., 2011; Roberts et al., 2011; Thompson-Ebanks & Jarman, 2018; Toutain, 2019; U.S. Government Accountability Office, 2009). Disability disclosure is highly personal, as it reveals private information to strangers, not just once but repeatedly throughout the educational process (Barnard-Brak et al., 2010; Cole & Cawthon, 2015). As a result, even though students are legally entitled to support and accommodations throughout their studies, many choose not to access them.

Students also report many issues in receiving supports and services at the institutional level. Faculty often treat accommodations as an inconvenience and technical requirement, and students feel that disability prejudices often impact their learning (Lindsay et al., 2018; Muilenburg & Berge, 2005; Quinlan et al., 2012). Students also describe difficulty using accommodations, inconsistent implementation, and inappropriate support types (Black et al., 2015; Cole & Cawthon, 2015; Sarrett, 2018).

In summary, the medical model treats disability as an individual problem that can be addressed through prescriptive measures. The accommodation process, in particular, perpetuates ableist practices further exacerbating barriers and perpetuating systemic inequities in authentic access to the instructional experience.

Accessibility and Social Model of Disability

In contrast, the social model establishes disability as a construct in which the process of access is the responsibility of the society rather than the individual (Bogart & Dunn, 2019; O'Shea & Kaplan, 2018). Through this lens, disability results from barriers set in place by a "discriminatory society" (Shakespeare, 1996). This naturally leads to the assertion that the goal is not to accommodate the individual but rather the environment so all people can fully participate in society (Magnus &

Tøssebro, 2014; Persson et al., 2015). Notably, this model reimagines the whole of society and not specific segments of it.

The concept of accommodating the environment is in line with inclusion, accessibility, and accessible design. According to Coleman and Berge (2018), the idea of accessible design has been described in many ways, including universal, inclusive, accessible, and barrier-free design. As a result, accessibility should be embedded within the development and design process for physical and virtual environments from the beginning (DeMaine, 2014; Office of Educational Technology, 2016).

In the context of distance education, accessibility should affect every aspect of providing resources and instruction to students. At the institutional level, accessibility begins to emerge as a process for proactively acquiring, developing, auditing, monitoring, and fixing online content that results in an accessible online environment (Ascough, 2002; Coleman & Berge, 2018; Golden, 2008; Linder et al., 2015). While students can formally request an accommodation for an accessibility need, they should not have to do so. In fact, 40% of students who chose not to disclose their disability simply needed accessibility adjustments, such as captioned videos (Online Learning Consortium [OLC] & WICHE Cooperative for Educational Telecommunications [WCET], 2019).

Accessible online courses provide students, particularly those with disabilities, the chance to select a learning format that works best for them (Roberts et al., 2011). In many instances, students with disabilities simply desire the option to attend a class virtually or use an accommodation without penalty. Students themselves have a growing expectation that instruction should be designed from the outset to meet the diverse needs of learners with different abilities and learning preferences (Quinlan et al., 2012). This suggests a shift towards a societal expectation for proactive and inclusive approaches to handling the needs of students with disabilities in an academic environment.

A Systems Perspective of COVID-19 Online Learning Experiences

The COVID-19 shift to online instruction has served to magnify the issues of ableism and inclusion already existing within the higher education setting. Most U.S. universities shifted all instruction to an online format during spring 2020 (Miller, 2021). The massive shift to virtual instruction underscored how ableism and inclusion impact students and learning at the macro-, meso-, and microlevels within online education. While there is limited research available, the anecdotal experiences of students, faculty, and institutions are still instructive.

Macrolevel: Cultural Factors

The macrolevel of online education consists of many factors including perceptions, beliefs, and pedagogy (see Fig. 2). One study illustrated the current mismatch between attitudes towards inclusion and the actions needed to achieve it. Surveyed faculty supported inclusive instruction and perceived the issues of disabled students as important (Madaus et al., 2021). However, faculty did not support the specific practices that would result in greater inclusivity (Madaus et al., 2021). While the belief in inclusion may be present, there are still cultural barriers toward perceptions of inclusive pedagogical practices. This confirms the need for an increased understanding that a commitment to accessibility and accommodation is a component of pedagogical practice (Linder et al., 2015; Quinlan et al., 2012). Further, accessibility, often confused with accommodations, includes practices that benefit all students (Burke, 2021; Harpur & Stein, 2018; OLC & WCET, 2019; Puang, 2021; U.S. Government Accountability Office, 2009).

Mesolevel: Factors Pertaining to Systems and Experiences

The mesolevel of online education consists of systems and experiences including services and supports, course delivery, and learning experiences (see Fig. 2). In one 2020 study, all students experienced difficulties with emergency online learning, but students with disabilities were still disproportionately impacted (Scott & Aquino, 2020). Students reported issues with accessing training and support for using technology, using their learning management systems, accessing instructional materials, and using their accommodations (Scott & Aquino, 2020). After an academic year of emergency online instruction, many students reported an improvement in many areas, including the ability to discuss emerging barriers and solutions (Scott & Aquino, 2021).

Students who previously encountered resistance in receiving their accommodations reported increased access to supports due to COVID-19. One social media study found a theme of disabled students criticizing institutions for the ableist practice of freely providing requested disability accommodations only when everyone needed them (Gleason et al., 2020). Students with disabilities reported frustration that their needs were only prioritized when they coincided with those of non-disabled peers (Puang, 2021). Disabled students have seen that universities can provide many previously denied accommodations, and they are now wondering why they should not continue receiving them (Morris & Anthes, 2021). Disability law experts also contend it will be difficult to claim that certain accommodations are unreasonable or pose an undue burden to the institution (Morris & Anthes, 2021).

From the institutions' perspectives, the difficulties experienced by students at the onset of emergency remote learning may have been due to the quick turnaround. Many staff responsible for disability services reported having problems switching

their services to a remote format (Scott & Aquino, 2020). As initial issues improved with time, staff also reported increased departmental cross-collaboration to achieve a more accessible online learning (Scott & Aquino, 2021). However, institutional support for accessibility was still lacking and was impacted by reduced budgets and staffing (Scott & Aquino, 2021).

While these reports represent a small glimpse of online learning experiences at the student and institutional levels during emergency remote learning, they call attention to issues already present. Previous research has highlighted the need for funding, staffing, infrastructure, education, policies, procedures, and support for accessible practices (Galusha, 1998; Linder et al., 2015; OLC & WCET, 2019; Raue & Lewis, 2011). Now, the institutional need for comprehensive systems supporting accessible and inclusive instruction has been elevated.

Microlevel: Experiences, Processes, and Artifacts

The microlevel of online education consists of experiences, processes, and artifacts that include course delivery, learning experiences, instructional practices, tools, software, and course content (see Fig. 2). Emergency remote instruction is thus a microcosm of how students are impacted at a course level. Additionally, most people will experience disability at some point in their lives (Dolmage, 2017). Accordingly, the number of students who needed accommodations in the online setting appeared to increase during the pandemic, especially for needs relating to mental health, attention deficit hyperactivity disorder, and chronic illnesses (Anderson, 2020; Scott & Aquino, 2021).

Based on reported accounts, many students receiving appropriate in-person accommodations were thrust into inaccessible online learning environments (Anderson, 2020). The nature of online instruction increased the use of learning management systems, video, and virtual conferencing platforms, which contain accessibility features that eliminated some students' need for certain in-person accommodations (Madaus et al., 2021). However, while many platforms were accessible, the online content provided was frequently not (Madaus et al., 2021).

As some disabled students experienced reduced barriers during online learning, others needed new or different supports (Madaus, 2011). Gleason et al. (2020) concluded that the shift to emergency online learning could have been more accessible "if the tools and content had been made accessible from the beginning" (p. 11). Anecdotal reports have shown students who benefitted the most had physical, visual, or medical disabilities, whereas students with executive functioning disabilities faced increased barriers to learning (Burke, 2021; Morris & Anthes, 2021; Puang, 2021). This indicates access to online learning can be a beneficial option for many students with certain disabilities because it can be more accessible and inclusive.

Moving Towards Inclusion and Accessibility

In summary, the onset of COVID-19 shifted the standard of practice towards the social disability model in which the environment was accommodated to flexibly meet the needs of many students. While an imperfect solution, this shift revealed a massive change to the learning environment is possible to ensure the inclusion of many different types of learning needs. While many issues were magnified during the COVID-19 pandemic, most had already been documented to varying degrees in online distance education research. This spotlight on online educational experiences has exposed the work still needed to achieve an accessible and inclusive online learning environment. Namely, efforts should be directed toward institutional cultures regarding disability and accessible online instructional content creation and delivery.

The shift from the medical to the social model of disability is a change in paradigms that changes all facets of how disability is addressed in educational law, policy, and practice. As pressure is placed on institutions to adapt, it creates a conflict between the new expectations and practices created under the previous paradigm. According to Reigeluth (2019), this creates a chaotic type of disequilibrium that moves an institution from "piecemeal change" toward true transformation and adoption of society's new values. As society moves toward more equitable practices of inclusion, institutions must embrace their role and alter the online learning environment and practices to ensure people of all abilities have the opportunity to benefit from higher education.

Lee (2017) asserted that increasing authentic access to online higher education is complex and challenging. The most significant barriers in online education currently reside with institutional factors including organizational structures and roles, the ability to change, the quality of social interaction with peers and faculty, technical support and infrastructure, and student support services (Berge et al., 2002; Berge & Muilenburg, 2001; Catalano, 2014; Galusha, 1998; Gaytan, 2015; Moore, 1994; Muilenburg & Berge, 2001; Smith, 2004). The research suggests that while beliefs may be changing, they have yet to transform the institution's infrastructure, processes, and behaviors.

Bogart and Dunn (2019) asserted there is a need to shift "to a social model focus highlighting universal design, which would create a new norm of accessibility" (p. 658). This model expects society to view and treat disability in an inclusionary manner. Designing universally accessible courses can support all learners rather than only students requiring accommodations (Catalano, 2014). From a systems perspective, this would affect every subsystem's operations so anyone can access or engage in instruction without requesting an accommodation.

The Practical Realities of Shifting Towards Inclusion

As the COVID-19 shift to emergency online learning revealed, changing practices may solve some existing issues while simultaneously creating new concerns. While meeting the accommodation needs of students is important, much more is needed for students with disabilities to feel that their disability will not negatively impact their achievement (Roberts et al., 2011). Focusing solely on accommodations or accessibility makes it easier for higher education institutions to overlook other factors that affect the holistic learner experience. According to Phipps and Kelly (2006), a holistic approach goes beyond an accessible online learning environment and includes all interactions comprising the education experience, online or not. The student experience requires understanding of "the context of delivery, which includes all the systems which impact on the degree of benefit students derive from their experiences" (White, 2005, p. 175).

A belief in inclusion and accessibility compliance alone will not lead to an inclusive online learning experience. While regulatory compliance may increase accessibility, it will not prevent all barriers (Kumar & Owston, 2016). Further, faculty willingness to implement inclusive practices varies (Madaus et al., 2021; Rao & Gartin, 2003), which exacerbates the unequal access to an inclusive educational experience. In practice, this means institutions should strive to proactively address as many needs as possible through accessible and inclusive design, understanding the design may not be sufficient for all needs. Although not ideal, the accommodation process is still helpful in meeting the needs of learners for whom the most accessible design possible is still lacking. Although residing in a gray area, this approach acknowledges the practical realities of striving for full inclusion while still being legally required to adhere to an accommodation system.

Suggestions for Inclusive Practice

It is instructive to examine institutional practices through the lenses of ableism and inclusion. Awareness of how systems and procedures harm or help the learner experience is the first step in enacting change. The range of suggested practices promotes systems-wide change towards more inclusive educational practices. The following suggestions for practice can be categorized into those affecting institutional systems, staff education, and instructional design.

Institutional Systems

Institutional systems ensure that inclusion is a foundation of all student experiences, and the following are recommended practices.

- Destigmatize disability services by integrating them into the panoply of student services available to anyone who qualifies.
- Involve students with disabilities in discussions on how to improve institutional disability services.
- Include disabled students in user-testing of processes, communication formats, and technology/software procurement committees.
- Expand the idea of accessibility and include students with disabilities with other student groups whose needs can also be met with an inclusive online design.
- Require disability statements in course syllabi and courses to increase student awareness of available services.
- Incorporate accessible online course design training into onboarding for all teaching staff.

Staff Education

An institution with an inclusive mindset ensures all staff understand how to serve students' diverse needs, and the following promote more positive practices toward students with disabilities.

- Educate staff and faculty about disability laws and the process required for the institution to grant reasonable accommodations.
- Have a communication and professional learning plan to address online instructional needs, including handling difficult conversations with staff.
- Promote high-impact and inclusive instructional strategies and accessible course design that proactively accommodate as many needs as possible.
- Include disability in diversity, equity, and inclusion initiatives that include other marginalized and intersecting identities.
- Provide training targeted toward fixing the most common accessibility issues in online courses.

Instructional Design

Since so many student experiences occur at the course level, instructional design practices can be scaled across the institution can guarantee a consistent level of accessible instruction. The following can support the systematization of accessible instructional practices.

- Conduct learner analyses that account for the most frequent types of online instructional activities and most needed accommodations.
- Provide systems and procedures for creating accessible online content and focus on most-used content types such as documents, presentations, and videos.

- Prioritize staffing and budgetary resources to address accessible online course design and services for students with disabilities.
- Provide an institutional process to review online course accessibility that identifies institutional areas of improvement and includes positive recognition of individual staff and faculty.
- Create policies for accessible online instructional materials.

Implementing inclusive and accessible design practices will not resolve all student needs. However, inclusive practices can improve the educational experience for all students. Further, these practices create a culture more likely to accommodate students' needs in a manner that does not stigmatize disability.

References

Anderson, G. (2020, April 6). *Accessibility suffers during pandemic*. Inside Higher Ed. https://www.insidehighered.com/news/2020/04/06/remote-learning-shift-leaves-students-disabilities-behind

Andrews, E. E., Forber-Pratt, A. J., Mona, L. R., Lund, E. M., Pilarski, C. R., & Balter, R. (2019). #SaytheWord: A disability culture commentary on the erasure of "disability.". *Rehabilitation Psychology, 64*(2), 111–118. https://doi.org/10.1037/rep0000258

Ascough, R. S. (2002). Designing for online distance education: Putting pedagogy before technology. *Teaching Theology and Religion, 5*(1), 17–29. https://doi.org/10.1111/1467-9647.00114

Barnard-Brak, L., Lechtenberger, D., & Lan, W. Y. (2010). Accommodation strategies of college students with disabilities. *Qualitative Report, 15*(2), 411–429.

Berge, Z. L., & Muilenburg, L. Y. (2001). Obstacles faced at various stages of capability regarding distance education in institutions of higher learning. *TechTrends, 45*(4), 40–45. https://doi.org/10.1007/BF02784824

Berge, Z. L., Muilenburg, L. Y., & Van Haneghan, J. (2002). Barriers to distance education and training: Survey results. *The Quarterly Review of Distance Education, 3*(4), 409–418. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.462.6499&rep=rep1&type=pdf

Black, R. D., Weinberg, L. A., & Brodwin, M. G. (2015). Universal Design for Learning and instruction: Perspectives of students with disabilities in higher education. *Exceptionality Education International, 25*(2), 1–26.

Bogart, K. R., & Dunn, D. S. (2019). Ableism special issue introduction. *Journal of Social Issues, 75*(3), 650–664. https://doi.org/10.1111/josi.12354

Bureau of Democracy, Human Rights, and Labor. (2021, January 20). *Promoting the rights of persons with disabilities*. United States Department of State. https://www.state.gov/promoting-the-rights-of-persons-with-disabilities/

Burke, M. (2021, August 10). After mixed experiences with distance learning, disabled California college students want flexibility. *EdSource*. https://edsource.org/2021/after-mixed-experiences-with-distance-learning-disabled-students-want-flexibility/659290

Burke, D. D., Clapper, D., & McRae, D. (2016). Accessible online instruction for students with disabilities: Federal imperatives and the challenge of compliance. *Journal of Law & Education, 44*(2), 135–181.

Catalano, A. (2014). Improving distance education for students with special needs: A qualitative study of students' experiences with an online library research course. *Journal of Library & Information Services in Distance Learning, 8*(1–2), 17–31. https://doi.org/10.1080/1533290X.2014.902416

Cole, E. V., & Cawthon, S. W. (2015). Self-disclosure decisions of university students with learning disabilities. *Journal of Postsecondary Education and Disability, 28*(2), 163–179. http://ahead.org/publications/jped/vol_28/no2tc

Coleman, M., & Berge, Z. L. (2018). A review of accessibility in online higher education. *Online Journal of Distance Learning Administration, 21*(1), 1–8. www.westga.edu/~distance/ojdla/spring211/coleman_berge211.html

Cullipher, V. (2017). Schools and organizations that serve education: Beware OCR complaints addressing online accessibility. *Microassist*. www.microassist.com/wp-content/uploads/2017/11/201711MLY-OCRandEducation-FINAL-acc.pdf

Culp, K. M., Honey, M., & Mandinach, E. (2005). A retrospective on twenty years of education technology policy. *Journal of Educational Computing Research, 32*(3), 279–307. https://doi.org/10.2190/7W71-QVT2-PAP2-UDX7

DeMaine, S. D. (2014). From disability to usability in online instruction. *Law Library Journal, 106*(4), 531–560. wunc.org/post/first-deaf-blind-student-harvard

Dictionary.com. (2021). Inclusion. In *Dictionary.com*. Retrieved May 29, 2021, from https://www.dictionary.com/browse/inclusion

Dolmage, J. T. (2017). *Academic ableism: Disability and higher education*. University of Michigan Press. www.press.umich.edu

Fennelly-Atkinson, R. (2021). *Associations between accessibility knowledge, practices, and support in U.S. online higher distance education: An exploratory factor analysis* [Unpublished doctoral dissertation]. Sam Houston State University.

Gabel, S. L., & Miskovic, M. (2014). Discourse and the containment of disability in higher education: An institutional analysis. *Disability and Society, 29*(7), 1145–1158. https://doi.org/10.1080/09687599.2014.910109

Galusha, J. M. (1998). *Barriers to learning in distance education*. (ED416377) ERIC. https://files.eric.ed.gov/fulltext/ED416377.pdf

Gaytan, J. (2015). Comparing faculty and student perceptions regarding factors that affect student retention in online education. *American Journal of Distance Education, 29*(1), 56–66. https://doi.org/10.1080/08923647.2015.994365

Gleason, C., Valencia, S., Kirabo, L., Wu, J., Guo, A., Carter, E. J., Bigham, J. P., Bennett, C. L., & Pavel, A. (2020). Disability and the COVID-19 pandemic using Twitter to understand accessibility during rapid societal transition. In T. Guerreiro, H. Nicolau, & K. Moffatt (Eds.), *ASSETS '20: The 22nd International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1–14). Association for Computing Machiner. https://doi.org/10.1145/3373625.3417023

Golden, N. (2008). Access this: Why institutions of higher education must provide access to the Internet to students with disabilities. *Vanderbilt Journal of Entertainment and Technology Law, 10*(2), 363–411. www.jetlaw.org/wp-content/journal-pdfs/Golden_final.pdf

Grimes, S., Scevak, J., Southgate, E., & Buchanan, R. (2017). Non-disclosing students with disabilities or learning challenges: Characteristics and size of a hidden population. *Australian Educational Researcher, 44*(4–5), 425–441. https://doi.org/10.1007/s13384-017-0242-y

Harpur, P., & Stein, M. A. (2018). Universities as disability rights change agents. *Northeastern University Law Review, 10*(2), 542–582. https://static1.squarespace.com/static/56a67d1e05caa777b1877b09/t/5bb4f8e7104c7b40147e6639/1538586859972/74710_Northeastern_Law_Vol_10_N02.pdf

Hemphill, H., Hemphill, L., & Runquist, R. (2019). Improving completion in online education systems: An application of systems thinking. In M. J. Spector, B. B. Lockee, & M. D. Childress (Eds.), *Learning, Design, and Technology* (pp. 1–36). Springer International. https://doi.org/10.1007/978-3-319-17727-4_104-1

Huss, J., & Eastep, S. (2016). Okay, our courses are online, but are they ADA compliant? An investigation of faculty awareness of accessibility at a Midwestern University. *I.E.: Inquiry in Education, 8*(2), 1–22. https://digitalcommons.nl.edu/ie/vol8/iss2/2/

Iglesias, A., Moreno, L., Martinez, P., & Calvo, R. (2014). Evaluating the accessibility of three open-source learning content management systems: A comparative study. *Computer Applications in Engineering Education, 22*(2), 320–327. https://doi.org/10.1002/cae.20557

Kumar, K. L., & Owston, R. (2016). Evaluating e-learning accessibility by automated and student-centered methods. *Educational Technology Research and Development, 64*(2), 263–283. https://doi.org/10.1007/s11423-015-9413-6

Lee, K. (2017). Rethinking the accessibility of online higher education: A historical review. *Internet and Higher Education, 33*, 15–23. https://doi.org/10.1016/j.iheduc.2017.01.001

Linder, K. E., Fontaine-Rainen, D. L., Behling, K., Rontaine-Rainen, D. L., & Behling, K. (2015). Whose job is it? Key challenges and future directions for online accessibility in US Institutions of higher education. *Open Learning, 30*(1), 21–34. https://doi.org/10.1080/02680513.2015.1007859

Lindsay, S., Cagliostro, E., & Carafa, G. (2018). A systematic review of barriers and facilitators of disability disclosure and accommodations for youth in post-secondary education. *International Journal of Disability, Development, and Education, 65*(5), 526–556. https://doi.org/10.1080/1034912X.2018.1430352

Madaus, J. W. (2011). The history of disability services in higher education. *New Directions for Higher Education, 154*, 5–15. https://doi.org/10.1002/he.429

Madaus, J. W., Gelbar, N., Faggella-Luby, M., & Dukes, L. L. (2021). Experiences of students with disabilities during the COVID-19 interruption of in-person instruction. *The Journal of Postsecondary Education and Disability, 34*(1) https://higherlogicdownload.s3.amazonaws.com/AHEAD/38b602f4-ec53-451c-9be0-5c0bf5d27c0a/UploadedImages/JPED/JPED_Vol_34/JPED_34_1_Full_Doc.pdf

Magnus, E., & Tøssebro, J. (2014). Negotiating individual accommodation in higher education. *Scandinavian Journal of Disability Research, 16*(4), 316–332. https://doi.org/10.1080/15017419.2012.761156

McAfee, & Taft. (2019, March 1). *Municipalities and universities new targets in ADA website accessibility lawsuits*. McAfee & Taft EmployerLINC. https://www.mcafeetaft.com/municipalities-and-universities-new-targets-in-ada-website-accessibility-lawsuits/

McGregor, K. K., Langenfeld, N., Van Horne, S., Oleson, J., Anson, M., & Jacobson, W. (2016). The university experiences of students with learning disabilities. *Learning Disabilities Research and Practice, 31*(2), 90–102. https://doi.org/10.1111/ldrp.12102

Miller, M. T. (2021). Do learning organizations learn? Higher education institutions and pandemic response strategies. *The Learning Organization, 28*(1), 84–93.

Moore, M. G. (1994). Administrative barriers to adoption of distance education. *The American Journal of Distance Education, 8*(3), 1–4.

Moore, M. G., & Kearsley, G. (2012). *Distance education: A systems view of online learning* (3rd ed.). Wadsworth.

Morris, A., & Anthes, E. (2021, August 23). For some college students, remote learning Is a game changer. *The New York Times*. https://www.nytimes.com/2021/08/23/health/covid-college-disabilities-students.html

Muilenburg, L. Y., & Berge, Z. L. (2001). Barriers to distance education: A factor-analytic study. *The American Journal of Distance Education, 15*(2), 7–22. https://doi.org/10.1080/08923640109527081

Muilenburg, L. Y., & Berge, Z. L. (2005). Student barriers to online learning: A factor analytic study. *Distance Education, 26*(1), 29–48. https://doi.org/10.1080/01587910500081269

Newman, L., Wagner, M., Knokey, A.-M., Marder, C., Nagle, K., Shaver, D., Wei, X., Cameto, R., Contreras, E., Ferguson, K., Greene, S., & Schwarting, M. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school: A report from the National Longitudinal Transition Study-2 (NLTS2)*. U.S. Department of Education.

O'Shea, A., & Kaplan, A. (2018). Disability identity and use of services among college students with psychiatric disabilities. *Qualitative Psychology, 5*(3), 358–379. https://doi.org/10.1037/qup0000099

Office of Educational Technology. (2016). *Future ready learning: Reimagining the role of technology in education*. U.S. Department of Education. https://tech.ed.gov/files/2015/12/NETP16.pdf

Online Learning Consortium, & WICHE Cooperative for Educational Telecommunications. (2019). *Accessibility survey of OLC and WCET members*. https://wcet.wiche.edu/initiatives/research/accessibility-survey-olc-wcet-2019

Persson, H., Åhman, H., Yngling, A. A., & Gulliksen, J. (2015). Universal design, inclusive design, accessible design, design for all: Different concepts—one goal? On the concept of accessibility—historical, methodological and philosophical aspects. *Universal Access in the Information Society, 14*(4), 505–526. https://doi.org/10.1007/s10209-014-0358-z

Phipps, L., & Kelly, B. (2006). Holistic approaches to e-learning accessibility. *Alt-J, 14*(1), 69–78. https://doi.org/10.1080/09687760500479860

Puang, S. (2021, May 11). As colleges strive for a return to normal, students with disabilities say, 'No thanks.' *The Chronicle of Higher Education*. https://www.chronicle.com/article/as-colleges-strive-for-a-return-to-normal-students-with-disabilities-say-no-thanks

Quinlan, M. M., Bates, B. R., & Angell, M. E. (2012). "What can I do to help?": Postsecondary students with learning disabilities' perceptions of instructors' classroom accommodations. *Journal of Research in Special Educational Needs, 12*(4), 224–233. https://doi.org/10.1111/j.1471-3802.2011.01225.x

Rao, S., & Gartin, B. C. (2003). Attitudes of university faculty toward accommodations to students with disabilities. *Journal for Vocational Special Needs Education, 25*(2), 47–54. (EJ854908). ERIC. https://files.eric.ed.gov/fulltext/EJ854908.pdf

Raue, K., & Lewis, L. (2011). *Students with disabilities at degree-granting postsecondary institutions: First look*. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. http://nces.ed.gov

Reigeluth, C. M. (2019). Chaos theory and the sciences of complexity: Foundations for transforming educational systems. In M. J. Spector, B. B. Lockee, & M. D. Childress (Eds.), *Learning, design, and technology: An international compendium of theory, research, practice, and policy* (pp. 1–12). https://doi.org/10.1007/978-3-319-17727-4_95-1

Roberts, J. B., Crittenden, L. A., & Crittenden, J. C. (2011). Students with disabilities and online learning: A cross-institutional study of perceived satisfaction with accessibility compliance and services. *Internet and Higher Education, 14*(4), 242–250. https://doi.org/10.1016/j.iheduc.2011.05.004

Sarrett, J. C. (2018). Autism and accommodations in higher education: Insights from the autism community. *Journal of Autism and Developmental Disorders, 48*(3), 679–693. https://doi.org/10.1007/s10803-017-3353-4

Scott, S., & Aquino, K. (2020). *COVID-19 transitions: Higher education professionals' perspectives on access barriers, services, and solutions for students with disabilities*. https://higherlogicdownload.s3.amazonaws.com/AHEAD/38b602f4-ec53-451c-9be0-5c0bf5d27c0a/UploadedImages/COVID-19_/AHEAD_COVID_Survey_Report_Barriers_and_Resource_Needs.pdf

Scott, S., & Aquino, K. (2021). *COVID-19 transitions: An update on access, barriers, and supports nine months into the pandemic*. https://higherlogicdownload.s3.amazonaws.com/AHEAD/38b602f4-ec53-451c-9be0-5c0bf5d27c0a/UploadedImages/COVID-19_/AHEAD_COVID_Survey_Report_Barriers_and_Resource_Needs.pdf

Shakespeare, T. (1996). Disability, identity, and difference. In C. Barnes & G. Mercer (Eds.), *Exploring the divide* (pp. 94–113). The Disability Press. https://disability-studies.leeds.ac.uk/wp-content/uploads/sites/40/library/Shakespeare-Chap6.pdf

Siebers, T. (2013). Disability and the theory of complex embodiment: For identity politics in a new register. In L. J. Davis (Ed.), *The disability studies reader* (5th ed., pp. 313–332). Taylor & Francis. https://www.google.com/books/edition/The_Disability_Studies_Reader/aiQlDwAAQBAJ?q=medical+model&gbpv=1#f=false

Smith, A. (2004). "Off-campus support" in distance learning – How do our students define quality? *Quality Assurance in Education, 12*(1), 28–38. https://doi.org/10.1108/09684880410517414

Tamim, S. R. (2020). Analyzing the complexities of online education systems: A systems thinking perspective. *TechTrends, 64*(5), 740–750. https://doi.org/10.1007/s11528-020-00538-9

Thompson-Ebanks, V., & Jarman, M. (2018). Undergraduate students with nonapparent disabilities identify factors that contribute to disclosure decisions. *International Journal of Disability, Development and Education, 65*(3), 286–303. https://doi.org/10.1080/1034912X.2017.1380174

Toutain, C. (2019). Barriers to accommodations for students with disabilities in higher education: A literature review. *Journal of Postsecondary Education and Disability, 32*(3), 297–310.

U.S. Department of Justice, Civil Rights Division, Disability Rights Section, & U.S. Department of Justice, Civil Rights Division, D. R. S. (2009). *A guide to disability rights laws*. https://www.ada.gov/cguide.htm

U.S. Government Accountability Office. (2009). *Higher education and disability: Education needs a coordinated approach to improve its assistance to schools in supporting students*. https://www.gao.gov/new.items/d1033.pdf

U.S. Department of State. (2021, January 20). Promoting the rights of persons with disabilities. https://www.state.gov/promoting-the-rights-of-persons-with-disabilities

Warr, M., Mishra, P., & Scragg, B. (2020). Designing theory. *Educational Technology Research and Development., 68*, 601–632. https://doi.org/10.1007/s11423-020-09746-9

Web Accessibility Initiative, & World Wide Web Consortium. (2019, June 5). *Introduction to web accessibility*. https://www.w3.org/WAI/fundamentals/accessibility-intro/

White, C. (2005). Contribution of distance education to the development of individual learners. *Distance Education, 26*(2), 165–181. https://doi.org/10.1080/01587910500168835

Accountability in Learning Design and Research as an Ongoing Practice

Katherine Walters and T. J. Kopcha

Accountability in Learning, Design, and Technology

This chapter introduces the various constructs at play when learning designers place accountability at the forefront of their work. Because learning design happens in collaboration with other people, we are (or ought to be) accountable to those people. Accountability in the context of learning, design, and technology (LDT) refers to a practice in which designers acknowledge the ways socio-cultural-historical contexts position people differently and affect the way dynamics such as power and responsibility emerge from this positioning. It also refers to the way designers consider their own perspectives so they may take action as they negotiate the positions and dynamics present in a given context. With current calls for social justice reverberating in both the streets and the classroom (e.g., MacDonald, 2021; Westerman, 2020), the need for accountability in LDT is perhaps greater than ever before.

As practitioners and scholars, however, it is often difficult to begin a conversation about accountability from an academic perspective. Accountability is a complex integration of several foundational theories and philosophies associated with ways of knowing ourselves and others in the world, including socio-cultural-historical considerations, positionality theory, intersectionality theory, and critical consciousness. The purpose of this chapter is to introduce these constructs and detail their interrelationships so other designers and researchers can practice accountability in their work.

Accountability is possible when we are "functionally and/or morally responsible" for an action (Bivins, 2006, p. 21). Being functionally responsible is typically

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more straightforward than being morally or ethically accountable. Functional responsibility is clearly stated, such as the role of a primary or principal investigator on a grant-funded project or contract. In such cases, accountability is reflected through a legal or professional obligation to fulfil the requirements of the project or contract—in other words, there is a "*liability* for ensuring a task is satisfactorily done" (McGrath & Whitty, 2018, p. 698, emphasis added). This is the form of accountability many instructional designers and researchers think about as they engage in field work.

Moral responsibility is less straightforward. Being morally responsible for an action requires one to complete an action at a level that meets the needs and/or approval of others. This goes beyond a legal function of responsibility and addresses the ways policies and project goals are situated in, and potentially in conflict with, social and cultural norms and practices. From this perspective, one's responsibility is often multiple, unclear, and complex. It requires one to consider the ways learning design and research occurs with and through people who are situated within larger socio-cultural-historical contexts (Yamagata-Lynch, 2010). Social structures and norms influence how we are perceived by others and how we *think* we are perceived; both influence decisions we make and the consequences of our decisions. Thus, accountability in learning design and research is more than the completion of project deliverables. Accountability requires an understanding of the roles we play, how those roles interact with others, the social and cultural norms that affect those roles, and the ways equitable relationships may be fostered within a given context.

Negotiating Accountability in Learning Design and Research

There are several foundational constructs associated with practicing accountability and understanding the ways equitable relationships may be fostered within a given context. Fig. 1 displays the various constructs and their interactions (e.g., positionality, intersectionality); those constructs are explained more fully below.

Social-Cultural-Historical Context

Central to Fig. 1 is a dotted sphere that appears within a socio-cultural-historical context. The positioning of the dotted sphere refers to the fact that anything we do, including learning design and research, is situated within a context. One level of context concerns the immediate environment, e.g., classroom furniture, temperature, and teacher support (Tessmer & Richey, 1997). This is often the focus of our instructional design models and initial environmental analysis (e.g., Dick et al., 2009; Morrison et al., 2019).

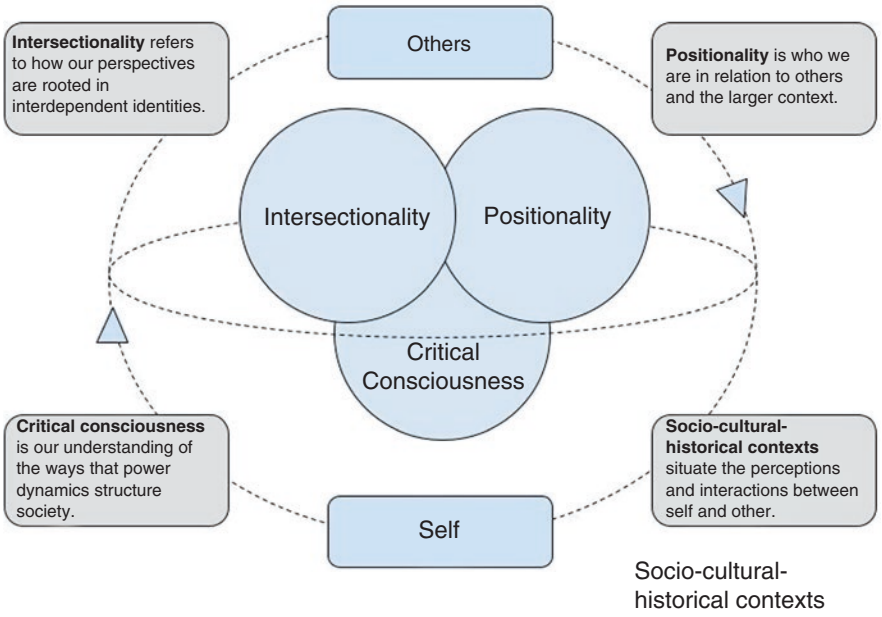

Fig. 1 Negotiating accountability in learning design

The socio-cultural-historical context represents the ways social and cultural norms, and their historical associations, shape our meaning-making and actions in the present (e.g., Rogoff, 2003; Vygotsky, 1978). Socio-cultural-historical contexts shape the way we develop, such as how we learn language, as well as the references and resources we use to communicate (e.g., the color red means stop). Projects often exist within multiple contexts shaping the ways we and others make sense of our interactions.

Intersection Between Oneself and Others

The dotted sphere in Fig. 1 connects the entities of *self* and *others.* The dotted line with arrows represents the ongoing interaction between oneself and others within a context. It is through this interaction we, as designers and researchers, develop an understanding of who we are and how we might un/intentionally affect others. In any project we assume a role, and often multiple roles. We might be a lead or co-designer, a subject matter expert, and/or a researcher or participant observer. Those roles frame our expectations for a project, what we expect from others, and what others might expect from us. This represents the beginning of the practice of accountability—one must be able to identify the roles we play within a context and how those roles relate with the people we interact with (i.e., others).

Positionality, Intersectionality, and Critical Consciousness

The inner circles in Fig. 1 represent constructs related to the interactions between self and others in a context: positionality, intersectionality, and critical consciousness. As noted above, any time we interact with others, we are positioned and position others in roles with certain responsibilities and expectations. Positionality theory posits the way we are socially positioned impacts the way we experience and make sense of the world (Haraway, 1988). The position we occupy determines whether we experience opportunities to access power and resources or whether we are denied this access. These experiences of privilege and oppression provide different experiential knowledge about the workings of social, political, and economic systems (Haraway, 1988). Positionality is about who we are and how we make sense of the world, situated in who we are in relation to others and the larger context.

Intersectionality theory proposes we hold multiple, interrelated social identities such as gender identity, race, ethnicity, and dis/ability. Intersectionality attends to the ways, the experiences, and expectations stemming from these identities intersecting in unique and complex ways (Crenshaw, 1989). Some identities may be more or less salient in a given context, and sometimes the expectations and experiences afforded by our identities are in conflict. For example, I experience gendered oppression as a woman, but racial privilege as a white person. Black feminists theorized these multiple experiences of oppression and/or privilege were not simply the sum of their parts (Combahee Collection, 1983). In other words, I do not experience the world first as a white person and then as a woman; I live an interdependent existence. This interdependent existence is the result of dynamic, ongoing, interactions between self, others, and context. Thus, at the heart of intersectionality is a focus on understanding how the differences between self and others are re/produced and experienced in response to the context.

Critical consciousness is an understanding of the way power dynamics structure our social systems, and the impact this has on our individual lived experiences. It is the ability to identify the way socio-political systems frame our values, practices, and interactions and how, through this framing, these systems promote marginalization and inequity (Freire, 1996; Goulet, 1998). Freire (1996) described critical consciousness as recognizing how the experiences of oppression, such as low income or poor housing, are not the result of individual failures but rather are rooted in social systems. Critical consciousness is therefore a way to make sense of who we are and who we are to others situated within the various power dynamics relevant to our lived experiences.

Practicing Accountability

At its core, learning design relies heavily on understanding the experiences of others—both in identifying the needs they have and their experience with the learning materials we develop (Stefaniak, 2021). To be accountable, then, a learning designer

must understand the interaction between how we know the world, personally, and how others know and experience the world. The constructs above provide ways to understand and situate these interactions as a guide for the practice of accountability. Below we describe three specific practices that are rooted in those constructs: self-reflection, critical perspective taking, and dialogic communication.

Self-Reflection

Self-reflection involves examining both one's beliefs and actions, and the relationship between the two (Finlay, 2008). Using the construct of positionality, one can reflect on how they are positioning others and what expectations they have based on this positioning. Questions that promote self-reflection tend to focus on making project roles and expectations clear: Are my expectations of others (i.e., positioning of others) in-line with project roles, and/or are they problematic for others? Are these expectations being openly discussed, and, if not, how might I create space for this discussion?

Positionality also provides an opportunity to consider how others are positioning you. How might your actions be perceived? What expectations do others have for your actions? How well are you fulfilling these expectations? Might there be hidden expectations, and how might you uncover these? These questions seek to bring the expectations of others to the forefront of a project to promote clear communication and productive interaction between oneself and others.

Critical Perspective Taking

Critical perspective taking is the practice of continually reflecting on potential issues of power in a given context. This requires an understanding of the sociocultural-historical context of a project, especially in terms of power dynamics, social identities, and the re/production of inequity. This understanding, rooted in the notion of critical consciousness, can then be used to situate critical perspective taking. For example, a lead designer on a project who is also the principal investigator on the grant funding the project may carry a perspective that they are "in charge" of decision making. If that person is also a white male, his perspective might contradict or even conflict with the perspectives of team members who come from a different racial and/or gender perspective. This power dynamic, if left unchecked or unresolved, might affect how willing the team members are to contribute to the project and, ultimately, whether the project succeeds.

Thus, critical perspective taking requires considering one's positionality and intersecting social identities, and the way those identities relate to other stakeholders in the project. Questions that promote critical perspective taking focus on one's position and the power dynamics associated with that position: What are your own beliefs and values, where do they come from, and how do they impact your actions and decisions in this project? How would other team members

answer these questions? How much autonomy do you believe your project members have, and how do those levels of autonomy serve or potentially harm the project?

Another aspect of critical perspective taking focuses on the re/production of oppression and privilege in a given context. There are perspectives and practices that our field takes as natural or neutral when, in fact, those perspectives are rooted in and reflect a white, male, able-bodied perspective. Critical perspective taking instead assumes *all* perspectives are situated. The goal of critical perspective taking is to monitor for and identify key perspectives that might be missing from a project and determine what perspectives need to be centered as a project unfolds. An example of this can be seen in the context of educational reform in underrepresented populations. Such reform efforts often focus on white neo-liberal views of success (e.g., achievement on high-stakes testing, percent of graduates in 4-year colleges) that do not account for the values of the community in which the reform is taking place (Lavalley, 2018). Scholars have repeatedly noted how such perspectives fail to address the socio-cultural-historical roots of oppression in a way that negatively affects educational outcomes in those communities (Lavalley, 2018; Schafft, 2016).

Dialogic Communication

Dialogic communication is a tool for producing new understandings across individuals' various perspectives and goals. Kinloch and San Pedro (2014) describe the engagement of this practice as a dialogic spiral through which we make connections by listening and revealing vulnerabilities. The purpose of the dialogue is not to raise one voice over another, or to prove one perspective right or wrong, but to produce a new, co-constructed perspective. This requires coming to the conversation with an understanding of one's positionality and intersecting identities, and the ways these interact with others' roles and identities. Acknowledging the validity of each person's perspective, while also understanding them as situated and not "Truth," allows for the building of rapport, trust, and acceptance.

It is important to engage in critical perspective taking to ensure the ways this action is practiced does not tend towards centering dominant perspectives. Through dialogic communication we can develop understandings of multiple perspectives in a project. These understandings help us answer important questions such as: How can we manage the differing goals and perspectives among a project team? What do we do when these goals and perspectives are in conflict? Who does our project affect directly or indirectly, how might it negatively affect them, and are we in regular communication with them about our work? Dialogic communication also helps us understand important issues of power related to the project when we listen to our participants as they communicate about their roles, identities, and perspectives related to their authority and vulnerability within the workplace or context of the project.

Accountability in Practice: An Example

Over the past 6 years, the authors have engaged in learning design and research in a rural community in the Southeastern United States. Like many rural areas in the South, the history of the community spans from the practice of slavery in the 1800's through the Civil War, Jim Crow, and the Civil Rights movement. With funding from a national grant, we worked alongside teachers, community members, and administrators to develop a curriculum that engaged K-12 students in humanities-focused, project-based lessons centered on their community. The larger goal was to support students in connecting their experiences in the present with the racial and economic inequality that has persisted in the community over time. This often required us to broach difficult topics such as slavery, segregation, and economic hardship (see Lawton et al., 2020).

As white scholars from non-rural communities, we had to hold ourselves accountable on multiple levels, taking time to understand how various perspectives could help shape the success of the project. Below we describe this process through the lens of a single moment experienced by and told from the perspective of the first author. The moment begins with a conversation with a 6th grade teacher who was implementing her project-based unit focused on engaging students in creating, sharing, and understanding the events of the past from multiple perspectives within the community.

A Critical Moment

> *"**I'm just tired of it always being about slavery.** History has taught us to focus on the negative. But kids are just kids. When you get them talking about themselves and what they like to do, they can think about the kids in the past that way too."*

When I heard what the teacher said, I knew immediately the "it" in her statement meant the project. In that moment, I realized I had not truly thought about the project from this teacher's perspective; I was limited by my own perspective, despite thinking otherwise. I often described the project as a way to provide students, about half of whom were African American, a central role in identifying, creating, and sharing previously untold stories from their community. From my perspective, the most important stories were those that recounted moments of inequity and oppression and the ways people pushed back against those forces. The teacher's words were jarring. They made me realize I was prescribing what I thought these stories should be rather than letting the students and the community decide what was important to tell.

Thinking about it now, I know where my assumptions came from. As a former community organizer, I often focused on stories of inequity and injustice, and the lessons learned from fighting against these forces. Those stories helped motivate community members to get involved in making positive change. Yet I overlooked

how the current context was very different from those I was used to working within. The purpose of the project was not to raise awareness about inequity in the community; this was not new information to the students, or their families. Instead, the project was about supporting students and community members to take control of the narrative(s) of their town. Although I intellectually understood this goal, this critical moment revealed my need for self-reflection about whether I was being accountable to this goal, and to these students. This critical moment was not simply a correction of an incorrect perspective. It was a realization that I needed to examine my assumptions in this context and, in turn, the impact of those assumptions on the design.

I needed to be accountable.

Unpacking the Model

To be accountable, I had to negotiate several complexities. As displayed in Fig. 2, those complexities involved the constructs of positionality, intersectionality, and critical consciousness. For example, the teacher's statement most immediately indicated that I first needed to better understand *her* position. Through critical perspective taking, I came to see how her perspective was informed by her experience as a sixth-grade teacher and, in particular, her experiences as a black woman who

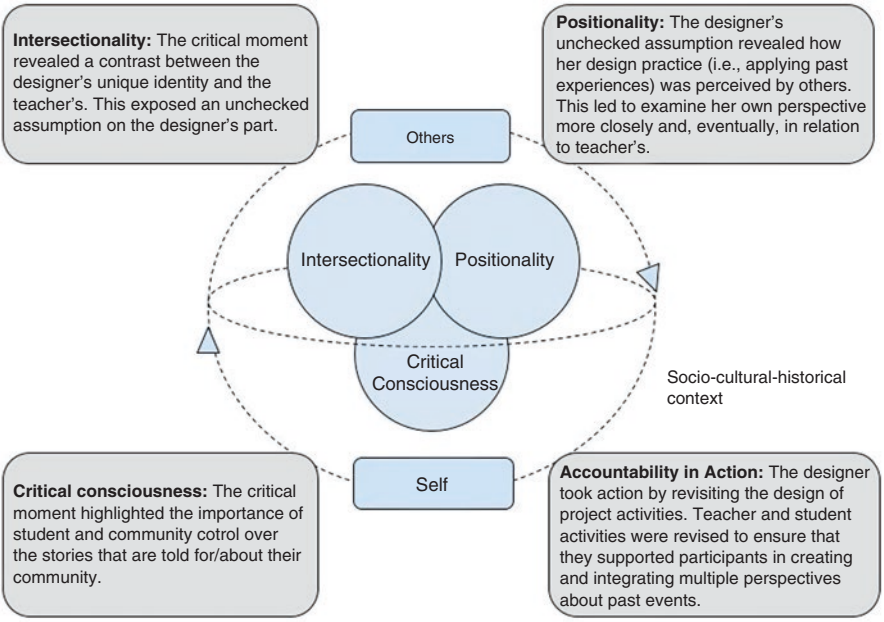

Fig. 2 Unpacking accountability as a practice

was raised and living in a rural county, working with students with similar backgrounds. It was the intersectionality of her identities that brought her to prioritize a narrative that was more than "being about slavery." She sought to provide space for her students to just be kids, to celebrate life's moments and be celebrated, protected, and seen. It was here I understood her desire to challenge the students' existing mindset around race and poverty and move beyond an overly simplistic and potentially harmful oppression narrative.

Next, I needed to understand my *own* position (Positionality). I had approached the project with the mindset of an organizer more so than an educator. Through self-reflection I identified the unchecked assumptions based on my previous experiences (e.g., what stories were important). It was through dialogic communication that I realized how my assumptions were perceived by the teacher as problematic.

I then needed to understand how the teacher's position related to my own. The teacher's perspective focused on community members as whole and complex individuals situated within a particular socio-cultural-historical context. I came to understand how my position may have unintentionally supported a dominant narrative which, in the US, often centers oppression as the singular experience of African Americans. Through this Dialogic Communication between perspectives, my understanding of the importance of historically situating oppression and racial inequity shifted. I realized how a focus on stories of oppression might contribute to a problematic narrative, and how important *other* stories of people's lives could be in challenging that narrative. In line with critical consciousness, I also had to recognize these narratives have material consequences as they shape our perceptions and actions. The teacher was not suggesting to gloss over oppression or ignore the material consequences of historic, systemic racial and economic inequity; rather, she was suggesting how important it was to *also* see the people and events of the past as something more. Her position sought to challenge an ongoing focus on oppression so stories of oppression were neither absent nor presented as the only stories that matter.

This new understanding led to changes to our design practice. The changes were not immediate or instantaneous—they emerged slowly over the next few months as I reflected on this new, more critical perspective and how it might affect our project and the people contributing to that project. For example, at the next professional development we centered the theme of community and the multiple narratives associated with that community. This supported teachers in designing activities that incorporated those themes and created opportunities for students to explore multiple perspectives of the past. We also revisited our initial commitment to our teachers, not as participants in a study but as co-designers in every sense of the word. With the construct of positionality in mind, we created a space to center the perspectives of the teachers. Through written feedback and ongoing conversations after the professional development, we continued to focus on the ways our teachers negotiated the complex socio-cultural-historical context surrounding the project. We reaffirmed our initial commitment to understanding our co-designers' positionality and intersectionality in relation to our own so we could better serve the community and students through our design practice.

Discussion

The chapter thus far has explained the constructs associated with accountability in LDT, the actions which support its practice, and situated both in a specific example. One potential misconception that might arise from this structure is that the act of being accountable is formulaic, like a recipe to be followed. In this section, we touch on three key ideas with the intent of dispelling any perception that accountability is straightforward. Our goal is to reify how accountability is a complex process that demands an attitude or mindset as much as a set of skills to be practiced, both of which lead to (or ought to lead to) action.

The first key idea is that the practice of accountability is ongoing. It is not a singular event taking place at a stage of design (e.g., needs assessment) but rather an ongoing practice in which designers self-reflect on how their perspectives and roles intersect with and, at times, potentially conflict with those of others. It acknowledges that our projects affect the context in which and with whom we work—and as they change, so must we. While being accountable may look different at different times, it embraces a core practice of acknowledging one's position in the world and continuously evaluating how that position may affect others, either directly or through our designs.

The ongoing nature of accountability leads to the second key idea, which is an acknowledgment of the ways accountability is professionally challenging. Instructional design models often support the notion that the designer is the neutral and objective expert. Accountability challenges that notion, taking the critical stance that you *cannot* be truly neutral as a designer. Designers have socially constructed complex identities (Intersectionality) that come to bear on their interactions with others (Positionality) and the context (Socio-cultural-historical). Rather than fight or hide the effects of one's identity on design practice, accountability encourages *transparency* as a designer—both in one's actions and the assumptions behind those actions (self-reflection). The challenge, then, is that transparency demands designers share their design thinking. It requires designers to be vulnerable and open about their practice, even when that practice is problematic (dialogic communication). Simply put, transparency means LDT, as a field, has to talk freely about what we do and how we hold ourselves accountable. While this is challenging, it will help add a new layer of validity and strength to our designs so accountability can become an inherent part of learning design and a cultural expectation in our field.

The previous key ideas lead to the third, which suggests accountability can be *personally* challenging. It requires designers to acknowledge, through critical perspective taking and reflection, that each of us brings a set of assumptions to a project rooted in our positions in the world. The challenge stems from the fact that assumptions often go unchecked—we take them for granted because they are part of who we are and how we make sense of the world. It is often not until our assumptions come into tension or conflict with another's position that we realize how they impact our design practice. Accountability suggests we have a responsibility to take action on these moments of tension while also engaging in continued reflection on how our identities and assumptions impact our design practice.

Conclusion

The practice of accountability requires us to consider how we perceive others, how others may perceive us in a given context, and the responsibilities associated with those perceptions. This chapter is an attempt to explain the complexities behind how those perceptions form and how we, as learning designers and researchers, can attend to the responsibilities arising from the various roles we play in the world. Negotiating accountability in learning design is not easy—it requires self-reflection, critical perspectives, and ongoing communication with those we work with so we may come to make better sense of the world and our relationships with others. While there is no recipe that guarantees or ensures accountability will be upheld in learning design and research, the tools presented in this chapter offer both a starting point for those new to accountability and ideas for augmenting the way others already engage in accountability as a practice.

References

Bivins, T. H. (2006). Responsibility and accountability. In K. Fitzpatrick & C. Bronstein (Eds.), *Ethics in public relations: Responsible advocacy* (pp. 19–38). SAGE Publishing.

Blackburn, M. V. (2014). Humanizing research with LGBTQ youth through dialogic communication, consciousness raising, and action. In D. Paris & M. Winn (Eds.), *Humanizing research: Decolonizing qualitative inquiry with youth and communities* (pp. 43–57). Sage Publishing.

Combahee Collective. (1983). The Combahee river collective statement. In B. Smith (Ed.), *Home girls: A black feminist anthology* (pp. 264–274). Rutgers University Press.

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *University of Chicago Legal Forum*, 139–167.

Dick, W., Carey, L., & Carey, J. O. (2009). *The systematic design of instruction* (7th ed.). Pearson Education.

Finlay, L. (2008). *Reflecting on "Reflective practice." Practice-based professional learning paper 52*. The Open University.

Freire, P. (1996). Pedagogy of the oppressed (revised). New York: Continuum, 356, 357–358.

Goulet, J. G. (1998). Ways of knowing: Experience, knowledge, and power among the Dene Tha. UBC Press.

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies, 14* (3), 575–599.

Kinloch, V., & San Pedro, T. (2014). The space between listening and storying: Foundations for projects in humanization. In D. Paris & M. T. Winn (Eds.), *Humanizing research: Decolonizing qualitative inquiry with youth and communities* (pp. 21–42). Sage.

Lavalley, M. (2018). *Out of the loop: Rural schools are largely left out of research and policy discussions, exacerbating poverty, inequity, and isolation*. Center for Public Education.

Lawton, C., Kopcha, T. J., Walters, K., & Ocak, C. (2020). Digital, experiential, and embodied: Reckoning with the past in Putnam County, Georgia. ILCEA. *Revue de l'Institut des langues et cultures d'Europe, Amérique, Afrique, Asie et Australie*, (39).

MacDonald, M. (2021, February 18). *UCLA to launch new social justice curriculum with $5 million grant from Mellon Foundation*. Retrieved March 15, 2021, from https://newsroom.ucla.edu/releases/social-justice-curriculum-mellon-foundation-grant

McGrath, S. K., & Whitty, S. J. (2018). Accountability and responsibility defined. *International Journal of Managing Projects in Business, 11*(3), 687–707.

Morrison, G. R., Ross, S. J., Morrison, J. R., & Kalman, H. K. (2019). *Designing effective instruction*. Wiley.

Roberts, P. (2000). *Education, literacy, and humanization: Exploring the work of Paulo Freire*. Bergin & Garvey.

Rogoff, B. (2003). The cultural nature of human development. Oxford university press.

Schafft, K. A. (2016). Rural education as rural development: Understanding the rural school–Community Well-being linkage in a 21st-century policy context. *Peabody Journal of Education, 91*(2), 137–154.

Stefaniak, J. (2021). Determining environmental and contextual needs. In J. McDonald & R. West (Eds.), *Design for learning (chapter 4)*. EdTechBooks.

Tessmer, M., & Richey, R. C. (1997). The role of context in learning and instructional design. *Educational technology research and development, 45*(2), 85–115.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Walker, M. U. (2007). *Moral understandings: A feminist study in ethics* (2nd ed.). Oxford University Press.

Westerman, A. (2020, December 30). *In 2020, protests spread across the globe with a similar message: Black lives matter.* Retrieved March 15, 2021, from https://www.npr.org/2020/12/30/950053607/in-2020-protests-spread-across-the-globe-with-a-similar-message-black-lives-matt

Yamagata-Lynch, L. C. (2010). *Activity systems analysis methods: Understanding complex learning environments*. Springer Science & Business Media.

Audio Description for 3-Dimensional (3D) Virtual Worlds

Peter Leong, Melissa Peterson, and Sarah Espinosa

The Fight for Accessibility

According to the World Health Organization (WHO) (2021), at least 2.2 billion people have a near or distance vision impairment worldwide. In the United States, the Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention Vision Health Initiative, 2020) ranks vision loss in the top ten causes of disability in the United States. There were an estimated 7.08 million people living with visual acuity loss or blindness in the US in 2017 with 1.62 million (22.89%) being under 40 years old (Flaxman et al., 2021). WHO (2021) indicates that early onset severe vision impairment in young children can create lifelong consequences due to delayed motor, language, emotional, social, and cognitive development, as well as contributing to lower levels of educational achievement in school-aged children. Vision impairment may increase social isolation and lead to higher rates of depression and anxiety, lower workforce participation, increased risk of injury, and greater likelihood of entry into nursing or care homes in older adults. Decreased sight often leads to the inability to drive, read, keep accounts, and travel in unfamiliar places. The cost of vision loss is estimated to exceed $35 billion (Rein et al., 2006). The social determinants of health including health care access and quality, neighborhood and built environment, social and community context, economic stability, education access, and quality and are key drivers of health inequalities, particularly among communities of color (Center for Disease Control and Prevention Vision Health Initiative, 2021). Creating a more accessible environment may help to mitigate certain risks experienced by the blind and visually impaired (BVI) community. Historically, individuals with disabilities have had to fight or litigate to be

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provided with access and supports for many opportunities that able people take for granted. Even recently, litigation has been needed to compel organizations to comply with the Americans with Disabilities Act (ADA) and provide blind people and those with low vision with better supports for experiencing museum exhibits, live theater, and movies on Netflix (Lewis, 2017). These experiences are visually rich, which makes them particularly inaccessible for anyone with a visual impairment. For similar visual experiences such as video games, virtual reality, and virtual worlds, affordances for blind users have been rare (Folmer et al., 2009). It seems likely that these users will need to continue to fight for each support that they need in order to have access to the learning opportunities, entertainments, and experiences that sighted people use daily.

3D Virtual Worlds and Higher Education

A three-dimensional (3D) virtual world is a simulated 3D environment that can be accessed online through a computer. Instead of a flat two-dimensional (2D) website, 3D virtual worlds allow users to interact through animated avatars (digital representations), customizable objects, instant text, and voice chat. The use of virtual worlds has been explored for purposes that include entertainment, socialization, education, and commerce. A 3D virtual world that is the most widely used and popular is Second Life (SL), a platform created by Linden Lab.

Many institutions of higher education have established their own presence in SL in order to explore the possibilities of stimulating different forms of learning (Michels, 2008). A number of universities have introduced virtual representations of themselves in the form of virtual campuses for supporting a wide range of educational activities. A virtual campus provides learners with a special place as a framework for learning activities and a set of tools to benefit the educational process (Clark & Maher, 2001). Due to COVID-19 pandemic, many academic-related activities pivoted to an online delivery format and the need for a virtual campus is more evident now than ever.

The University of Hawai‘i’s (UHM) College of Education Second Life (COE SL) virtual campus was launched on March 4, 2011. The COE SL virtual campus was built with the help and advice of the COE SL advisory board of nine members representing the college’s stakeholders. Following Prasolova-Førland et al. (2006) proposed six requirements for a 3D virtual campus representing a real university; the college made the decision to design the virtual campus to partially resemble the real campus while creating other new fictitious places to meet all the goals of the COE SL virtual campus.

The virtual campus features a replica of the Wist-Everly Hall complex which houses the faculty offices and the college’s Office of Student Academic Services, the Diamond Head Amphitheatre, the Holomua Learning Area, a tree house, the Hale Avenue dormitory and a dockside coffee shop. In 2018, the COE SL virtual campus was moved to OpenSim, a free and open-source software that allows

anyone to create a 3D virtual world similar to SL. The affordances of creation or construction are unique to 3D virtual worlds (Scopes, 2009), and allow them to be used more dynamically than some games for learning or static virtual reality experiences.

3D Virtual Worlds, Immersion, and Accessibility

One of the most interesting affordances of 3D virtual worlds is providing users with a feeling of immersion or presence in the world (Cooper et al., 2018; Iachini et al., 2019). Presence is the concept that a technologically mediated experience can feel like a natural or real-world experience (Lombard & Ditton, 2006). In other words, the user feels as though they are their avatar in the virtual space. As virtual reality headsets and haptics improve, a sense of presence in a virtual world becomes easier to achieve and more powerful. However, without the use of alternative sensory inputs to vision, these technologies are inaccessible from being used by a significant portion of the population (Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, 2020). This also makes accessibility efforts more difficult, as basic usability is only the first step in making an equitably immersive experience. Remedies for improving sense of presence in virtual reality for visual impairment have included the application of tactile feedback and enhanced auditory and texture perceptions for spatial mapping and navigation (Cobb & Sharkey, 2007).

From an assistive technology standpoint, 3D virtual worlds without alternative sensory inputs have little to offer people with disabilities because the experience is largely visual in nature and user inputs often require extensive hand/eye coordination to precisely control an avatar's movements. Wood et al. (2009) identified numerous accessibility limitations of 3D virtual worlds to students with disabilities. BVI students face significant barriers to entry to 3D virtual worlds, specifically challenges on how they navigate and orient themselves within virtual spaces.

Wayfinding is the ability to find one's way to a destination in an unfamiliar environment. Sighted and BVI people's ability to sense and traverse in a new environment are distinctly different. Ko and Kim (2017) indicate that while sighted people construct 3D maps based on visual sensory information, BVI people use different "cognitive and attentional resources" (p. 1). Piloting (reliance on environmental features like terrain change as computation for distance and angle) and path integration (processing self-motion with respect to a reference location) are wayfinding tools with varying reliability to BVI people (Klatzky et al., 2006). In a physical environment, BVI people can rely upon audition, olfaction, and thermal cues with varying degrees of precision, as well as touch for silent, yet tangible features. BVI people are at a disadvantage when entering a new environment, experiencing an unexpected detour, obstacle avoidance, and ability to maintain heading (Klatzky et al., 2006). Because of this, solutions for BVI people in wayfinding have focused on technological aids, both physical (canes, Braille, sound systems) and virtual

(spatialized sound, QR codes), particularly global positioning systems (GPS) for use in outdoor settings. Indoor settings complicate these GPS systems due to inconsistencies in signal access and stability and complicated illumination patterns and backgrounds that make it difficult for systems to identify layouts (Ko & Kim, 2017). Sensor-based and vision-based approaches have been implemented to address these challenges indoors, including Wi-Fi, radio frequency identification (RFID), and ultra-wide band (UWB) sensors and color-codes. Ko and Kim (2017) recommend utilizing a situational-based wayfinding system that supports two basic functions: positioning (to localize a user's position) and path guidance (to guide a user through a route to the target destination and the return route).

Barriers to navigation exist in physical spaces as well as virtual spaces. Identifying best practices in physical space wayfinding and virtual space wayfinding may offer insight into developing practical applications for virtual world wayfinding. Ko and Kim's (2017) situational-based wayfinding system consists of five processing modules: situation awareness, object detection, object recognition, user trajectory recording, and activity-based instruction. In this model, several systems must be present. The scene objects detected must be determined. Situations that occur in the environment should be modeled and templates created. A vocabulary tree should be built from the template and used to describe and compare images. With this model, iPhones were given to participants to navigate in an unfamiliar environment. Using the situational based model and color-coded QR codes to present the environmental information, as well as embedded directional aids, BVI participants were able to locate paths with 97% accuracy. Klatzky et al.'s (2006) use of virtual sound for providing primary cues as a source of auditory spatial perception indicates greater spatial awareness for BVI people than spatial language cues. With spatial language, the way finder is given directional cues such as clock numbers (the target is at 4 o'clock), degrees (the target is 90 degrees left), directions (left, behind), and compass (north, east). Correction using spatial language is helpful on paths; however, distractions while traveling are inevitable, and can influence working memory of locations. With virtual sound, sound cues are provided to the wayfinder that indicate distance and step. Klatzky et al. (2006) implemented this within a virtual reality environment using physical steps to move the avatar. Sound and vibration were used in three navigation trials with results indicating that virtual sound lessens cognitive load for wayfinding when compared to spatial language cues.

Information in virtual spaces is presented graphically rather than with textual equivalents. In particular, user generated content within 3D virtual worlds is not accessible to visually impaired users. As 3D virtual worlds seem unlikely to become obsolete soon, and are becoming increasingly common with the use of virtual reality headsets (Cooper et al., 2018), providing assistive technology in-world, using universal design principles, and preemptively complying with the ADA become important considerations for any developer or designer in this field.

This chapter describes a project that seeks to develop best practices for creating audio description for 3D virtual worlds, such as OpenSim, in order to provide access to students with visual impairments and to enhance universal design for learning. Tao et al. (2017) contend that considerations for developing accessible virtual world

experiences should include consistency in labeling that includes texture, the name of the item, and directions. While real-time auditory guidance along mapped routes is ideal (Tao et al., 2017), having freedom of exploration may be possible with audio description.

Like other "assistive technology," audio description is geared primarily toward people who are blind or visually impaired, but many sighted people can benefit from the "description's concise, objective 'translation' of the key visual components of various art genres and social settings" (Snyder, 2014, p.46). This project used participatory design approaches to develop best practices for creating supports to provide access for blind and visually impaired students by creating and evaluating the use of audio descriptions for the UHM COE OpenSim virtual campus as a proof of concept.

The Audio Description for 3D VW (AD3D) Project

Virtual reality offers great potential for people with disabilities; however, it suffers from major accessibility issues (Phillips, 2020). While efforts have been made to devise best practices for creating audio descriptions for 360-degree videos (Herndon, 2020), to our knowledge, there has been no initiative to incorporate audio descriptions into 3D VW. The AD3D project aims to bring awareness to the need for audio description for 3D VW and to develop best practices for creating audio description for 3D virtual worlds for the purpose of providing access to the 3D virtual world of OpenSim for blind and visually impaired students.

Audio description involves the accessibility of the visual images of theater, television, movies, and other art forms for people who are blind, have low vision, or who are otherwise visually impaired. It is a narration service (provided at no additional charge to the patron) that attempts to describe what the sighted person takes for granted, those images that a person who is blind or visually impaired formerly could only experience through the whispered asides from a sighted companion (The Audio Description Project, n.d.).

Participatory Design Approach

Participatory design, which has its roots from the early 1970s in Scandinavia (Ehn, 1989), is a practice in usability studies which aims to actively include the end-users into the design process. Participation of stakeholders is important in understanding a particular community's needs and co-designing tools that meet those needs (HingTing & Di Loreto, 2017). Because the blind and visually impaired community is not homogeneous, participatory design allows designers to focus on BVI people's experience to reach in-depth understanding and drive design changes throughout subsequent iterations (Cranmer, 2020). In this proof-of-concept project, BVI users

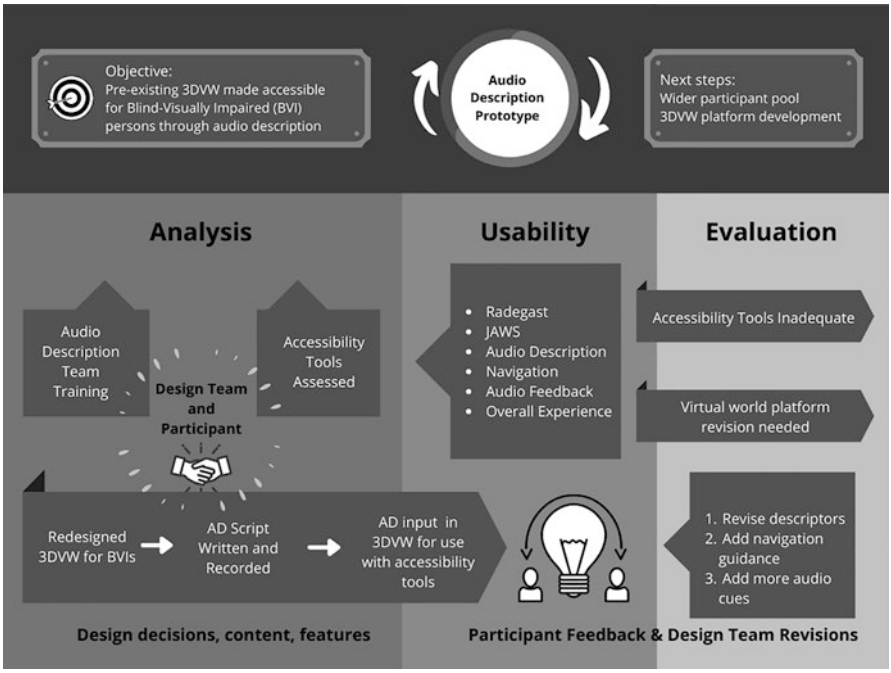

Fig. 1 Audio description for 3D VW project timeline
Note. The image of the audio description prototype denotes an iterative process. The arrows in the analysis phase indicate that the analysis stems from the objective

were involved in the initial exploration work and prototyping stage (Spinuzzi, 2005). To better understand the needs of BVI users, we attended an online audio description team training program offered by the Audio Description Training Retreats (http://www.adtrainingretreats.com/). During the analysis phase of this project (see Fig. 1), we attended an audio description training and assessed accessibility tools to meet our objective of making our pre-existing 3D VW in OpenSim accessible for visually impaired persons through audio description. The online audio description training retreat provided hands-on training relevant to creating audio description for television, film, live theater, and other settings. The instructors, a professional describer and a BVI audio description consumer, provided feedback and critique from both perspectives allowing the design team and participants to contribute to the analysis phase. This allowed us to redesign our 3D VW for BVI users, write the script, and record our audio description, and input the recording into OpenSim for use alongside accessibility tools to aid in navigation and user experience.

In the prototyping stage, we conducted formative usability testing and interviews with two BVI users. We conducted formative usability testing where we observed how BVI users actually experience the audio description and understand their thought processes using the think-aloud method. We conducted semi-structured

interviews with BVI users to understand the needs of BVI individuals to be able to successfully navigate in a 3D VW. We also gained perspectives from both the design team and participants on the Radegast viewer and JAWS screen reader usability in OpenSim and used all feedback to revise descriptors, add navigation, and include additional audio cues. Finally, after evaluating the audio description and tools used with them, we determined that the current accessibility tools for audio description were inadequate and the virtual platform itself needed revision to be accessible.

Design of Audio Description Prototype for the COE OpenSim Virtual Campus

Two overarching principles guided the design of the audio descriptions for the COE OpenSim virtual campus:

- To promote independence and agency
- To thoroughly describe visual content without judgment about what is "important" or "most useful" (Conway et al., 2020)

First, audio description was created to set the mood and provide an overview of the Holomua Learning Area. When an avatar arrives at the Holomua Learning Area, this overview audio description will automatically play in the parcel audio streaming.

In addition to creating audio descriptions, to promote agency and independence, we devised structures and strategies that would aid BVI users to navigate independently within the Holomua Learning Area. We designed walking paths with semi-translucent barriers on either side of the path as well as a "thud" sound trigger to alert when an avatar ventures off the path. The path has various junction points and walking over a junction will trigger a voice prompt that tells users how to enter and exit to various locations.

Lessons Learned from the Prototyping Stage

To understand the perspective of potential BVI stakeholders, we conducted formative usability testing of our intervention with two BVI individuals. Unlike 2D web usability, usability testing of 3D VWs involves "complex, multiple, interdependent layers that must be taken into consideration" (Espinosa & Leong, 2021, p. 131). We planned our usability test to focus primarily on the audio descriptions in our COE OpenSim virtual campus simulation, setting aside the fact that the user interface of the Firestorm viewer used to access OpenSim is currently not fully accessible (i.e. not screen readable). Participants' avatars would be positioned at the landing point of the Holomua Learning Area from which the usability test would proceed. Participants were asked to listen to audio description and interact with the virtual

world space using think-aloud protocol to verbalize their thought process. Unfortunately, we quickly discovered that aside from the audio descriptions we created, there was a total absence of in-world auditory cues to help orientate the visually impaired participant to the 3D virtual space. For example, our blind user had no idea that their avatar was moving because there were no footstep sounds and didn't know when their avatar hit an object (e.g. wall) and just kept walking in place because there was no collision sound. Participants' ongoing think-aloud, along with their screen reader activity, was recorded via Zoom and transcribed using otter.ai. Selected participant quotes and the matching protocol questions can be found in Table 1.

We quickly found that the most important focal point for this and future efforts is enabling BVI users to construct a mental model of the 3D virtual space.

Table 1 Prototyping protocol and select participant quotes

Audio description (AD) evaluation questions: 1. Is the content of the AD helpful? Do you feel more information is needed? 2. Is the quality of the audio clear? 3. How do you feel about the background music? 4. Length of the AD appropriate?	**Select Participant Quotes:** "[J]ust hearing the description once in a huge chunk is kind of, was kind of a lot of information at the same time." – A "I will say it's a beautiful, like, if somebody was talking to me the way she described it. It's, it's beautiful." – B
Navigation questions: 1. Are you able to stay on the pathway? Is the "thud" audio cue helpful? 2. Are you able to navigate through the junctions? Is the audio directions helpful? Clear? 3. Did the AD provide sufficient assistance for you to navigate independently? 4. If not, what else could we provide to help you navigate independently?	"Just, like, open area. It's like, okay, well, what, uh, what are my, you know, what am I? Where am I? What am I doing, but like a classroom or a room, it's, um, a little bit more feasible to have your character kind of free explore." – A "I could do the clock stuff, you know, the 11 o'clock and the 12 o'clock. But I generally don't prefer that. I don't know how many blind people do that if you just give me to the left a view or to the right." – B "Yeah, and I think, you know, I think that is like when you're walking and you can hear the footsteps, kind of you're, you're maybe only hearing the footsteps and maybe that you're outside. … Or, like, you know, you've reached like I said, when you reach near a waterfall, you've been here, that waterfall and you can, you know, that's what you're hearing. And also, that somehow that ability to not go so far off the radar. ... Um, so the ability to have a soundscape that also has like barriers within the world a little bit where you can still explore, but you're also not going to go like into the ocean." – A

Unfortunately, our initial audio descriptions, in and of themselves, were not successful at facilitating this. A full description of even a small part of the virtual world was overwhelmingly long for the BVI participant, and shorter navigational aid descriptions could be confusing, as there was no way to orient themselves to the 3D virtual space. Our BVI participants suggested two distinct types of supports: (1) auditory, and (2) user experience design. These two types of support consisted of several different recommendations, but most of these clearly impact the user's ability to form a mental model or map of the 3D virtual world.

Starting with the auditory supports, the main recommendations included: providing environmental sounds through object interaction; creating audio landmarks with distinct sounds; editing the audio descriptions to provide a combination of succinct overview descriptions and detailed descriptions attached to points of interest or landmarks. Each of these recommendations parallels ways in which visually impaired stakeholders learn to navigate real world spaces. For instance, having a landmark such as a fountain or waterfall which makes an easily identifiable sound can allow a user to auditorily confirm that their location in a space matches their mental model of the space. This concurs with what researchers have previously proposed, that spatial knowledge is learned through the three distinct stages of "landmark," "route," and "survey" (Siegel & White, 1975). Our initial efforts provided audio descriptions of objects and spaces as a user approached them, but finding those objects or spaces was nearly impossible without auditory cues or major changes to the design of the 3D virtual space.

In addition, recommendations for additional user experience or user experience design elements were made, in particular: having more restrictive walled paths between points of interest, creating a Nonplayer Character (NPC) companion who can provide directions to landmarks or an avatar's relative location in an area, and providing a screen readable map that allows a user to teleport their avatar between locations. While the teleportation map is the least supportive of a user's mental model, the other two recommendations again mimic ways in which a blind person may navigate real world spaces, such as staying on paved paths, or using a guide dog to help with safe navigation. The map would allow a user to skip the longer and potentially frustrating process of navigating the same path repeatedly, and thus is more related to convenience and engagement.

One thing of particular note is the idea of engagement. The purpose of this project is to provide an equally engaging and immersive experience for both sighted and BVI participants. An experience which is technically accessible but is not engaging or useful does not provide equity. To that end, future efforts will be focused on creating 3D virtual spaces which are not only accessible, but are also engaging for multiple senses, not merely the visual.

Conclusion and Next Steps

The blind population is very heterogeneous. Even within our two-participant sample, we received diametrically opposed feedback, as can be seen in Table 1. This poses great challenges to researchers developing navigational support interventions for blind people (Schinazi et al., 2016). We need to focus our efforts on understanding how to provide support for visually impaired users to construct a mental model of the 3D virtual space.

Next, we plan to revise the prototype of our audio descriptions and navigation supports based on the lesson learned from our stakeholder formative usability testing and interviews, after which we will conduct summative evaluation of the audio descriptions and navigation supports of the Holomua Learning Area. We plan to recruit both visually impaired and sighted students to evaluate the effectiveness of and their satisfaction with the audio descriptions. Participants will spend time navigating and evaluating the audio descriptions of the COE OpenSim virtual campus. Feedback from both groups of students will help us improve the quality and process of creating audio descriptions for 3D virtual worlds. The summative evaluation will involve both quantitative and qualitative online methods. Students will complete an online satisfaction survey and participate in a usability study which will take place online using the Zoom web conferencing system. Data collected from both visually impaired and sighted students will be analyzed for similarities and differences.

Both the current study and proposed future research has broader implications for sighted stakeholders, particularly in education. As discussed, one of our goals is to bring attention to the need for accessibility support for blind people and people with visual impairments in 3D virtual spaces. During the course of this study, the true scope of the problem became clear to us. We found it virtually impossible to use the Radegast viewer on our own, and the frustration we felt echoed that of our BVI participants when using the visual browsers. By demonstrating how inadequate the current supports are, we are able to provide school administrators, parents, teachers, and policy makers with a complete picture of what the problems are and how we might be able to move forward together into these 3D virtual spaces.

References

Centers for Disease Control and Prevention Vision Health Initiative. (2020, June 9). *Fast facts about common eye disorders.* https://www.cdc.gov/visionhealth/basics/ced/fastfacts.htm

Centers for Disease Control and Prevention Vision Health Initiative. (2021, June 9). *Addressing the social determinants of health.* https://www.cdc.gov/visionhealth/determinants/index.html

Clark, S., & Maher, M. L. (2001). The role of place in designing a learner centered virtual learning environment. In B. de Vries, J. van Leeuwen, & H. Achten (Eds.), *Proceedings of CAAD Futures 2001* (pp. 187–200). Kluwer Academic Publishers.

Cobb, S., & Sharkey, P. M. (2007). A decade of research and development in disability, virtual reality, and associated technologies: Review of ICDVRAT 1996–2006. *IJVR, 6*, 51–68.

Conway, M., Oppegaard, B., & Hayes, T. (2020). Audio description: Making useful maps for blind and visually impaired people. *Technical Communication, 67*(2), 68–85.

Cooper, N., Milella, F., Pinto, C., Cant, I., White, M., & Meyer, G. (2018). The effects of substitute multisensory feedback on task performance and the sense of presence in a virtual reality environment. *PLoS One, 13*(2), e0191846. https://doi.org/10.1371/journal.pone.0191846

Cranmer, S. (2020). Disabled children's evolving digital use practices to support formal learning. A missed opportunity for inclusion. *British Journal of Educational Technology, 51*(2), 315–330. https://doi.org/10.1111/bjet.12827

Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion. (2020, June 9). *Fast facts of common eye disorders*. Centers for Disease Control and Prevention. https://www.cdc.gov/visionhealth/basics/ced/fastfacts.htm

Ehn, P. (1989). *Work-oriented design of computer artifacts*. Lawrence Erlbaum Associates.

Espinosa, S., & Leong, P. (2021). Complex, multiple, interdependent layers (C-MIL): A conceptual model for usability studies in 3-dimensional virtual worlds. In E. Romero Hall (Ed.), *Research methods in learning design & technology* (pp. 126–145). Routledge. https://doi.org/10.4324/9780429260919

Flaxman, A. D., Wittenborn, J. S., Robalik, T., Gulia, R., Gerzoff, R. B., Lundeen, E. A., Saaddine, J., Rein, D. B., Vision and Eye Health Surveillance System study group, Baldonado, K. N., Davidson, C., Dougherty, M. C., Duenas, M. R., Friedman, D. S., Jackson, K. M., Joslin, C. E., Klein, B. E. K., Lamuda, P. A., Liu, Y., et al. (2021). Prevalence of visual acuity loss or blindness in the US: A Bayesian meta-analysis. *JAMA Ophthalmology, 139*(7), 717. https://doi.org/10.1001/jamaophthalmol.2021.0527

Folmer, E., Yuan, B., Carr, D., & Sapre, M. (2009). TextSL: A command-based virtual world interface for the visually impaired. *Proceedings of the 11th International ACM SIGACCESS Conference on Computers and Accessibility*, 59–66. https://doi.org/10.1145/1639642.1639654.

Herndon, J. (2020, May 14). Audio descriptions for 360-degree video: Recap of Webinar. *Equal Entry*. https://equalentry.com/audio-descriptions-for-360-degree-video-recap/

HingTing, K. L., & Di Loreto, I. (2017). A participatory design approach with visually impaired people for the design of an art exhibition. *International Journal of Sociotechnology and Knowledge Development, 9*, 43–57. https://doi.org/10.4018/IJSKD.2017100104

Iachini, T., Maffei, L., Masullo, M., Senese, V. P., Rapuano, M., Pascale, A., Sorrentino, F., & Ruggiero, G. (2019). The experience of virtual reality: Are individual differences in mental imagery associated with sense of presence? *Cognitive Processing, 20*(3), 291–298. https://doi.org/10.1007/s10339-018-0897-y

Klatzky, R. L., Marston, J. R., Giudice, N. A., Golledge, R. G., & Loomis, J. M. (2006). Cognitive load of navigating without vision when guided by virtual sound versus spatial language. *Journal of Experimental Psychology: Applied, 12*(4), 223–232. https://doi.org/10.1037/1076-898X.12.4.223

Ko, E., & Kim, E. Y. (2017). A vision-based wayfinding system for visually impaired people using situation awareness and activity-based instructions. *Sensors, 17*(8), 1882. https://doi.org/10.3390/s17081882

Lewis, E. (2017, April 5). *Audio description lawsuits: Netflix, Hamilton, UC Berkeley, and AMC Theatres*. https://www.3playmedia.com/blog/audio-description-lawsuits/

Lombard, M., & Ditton, T. (2006). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication: JCMC, 3*(2). https://doi.org/10.1111/j.1083-6101.1997.tb00072.x

Michels, P. (2008). Universities use second life to teach complex concepts. *Government Technology*. http://www.govtech.com/gt/252550

Phillips, K. U. (2020, January 29). *Virtual reality has an accessibility problem.* https://blogs.scientificamerican.com/voices/virtual-reality-has-an-accessibility-problem/

Prasolova-Førland, E., Sourin, A., & Sourina, O. (2006). Cybercampuses: Design issues and future directions. *The Visual Computer, 22*(12), 1015–1028.

Rein, D., Zhang, P., Wirth, K., Lee, P., Hoerger, T., McCall, N., Klein, R., Tielsch, J., Vijan, S., & Saadine, J. (2006). The economic burden of major adult visual disorders in the United States. *Archives of Ophthalmology, 124*(12), 1754–1760. https://doi.org/10.1001/archopht.124.12.1754

Schinazi, V. R., Thrash, T., & Chebat, D.-R. (2016). Spatial navigation by congenitally blind individuals. *Wiley Interdisciplinary Reviews. Cognitive Science, 7*(1), 37–58. https://doi.org/10.1002/wcs.1375

Scopes, L. J. M. (2009). *Learning archetypes as tools of cybergogy for a 3D educational landscape: A structure for eTeaching in Second Life*. University of Southampton.

Siegel, A., & White, S. (1975). The development of spatial representations of large-scale environments. *Advances in Child Development and Behavior, 10*, 9–55.

Snyder, J. (2014). *The visual made verbal: A comprehensive training manual and guide to the history and applications of audio description*. Dog Ear Publishing.

Spinuzzi, C. (2005). The methodology of participatory design. *Technical Communication, 52*(2), 163–174.

Tao, Y., Ding, L., & Ganz, A. (2017). Indoor navigation validation framework for visually impaired users. *IEEE Access, 5*, 21763–21773. https://doi.org/10.1109/ACCESS.2017.2761698

The Audio Description Project. (n.d). *The Audio Description Project: An initiative of the American Council of the Blind*. https://acb.org/adp/ad.html

Wood, D., Morris, C., & Ussery J. (2009, July). *Accessibility solutions for 3D virtual learning environments*. Paper presentation at the IEEE Conference.

World Health Organization. (2021, February 26). *Blindness and vision impairment.* https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment

Being Cognizant of Diversity, Intersectionality, Privilege, Equity, and Inclusion as ECT Scholar-Practitioners

Deepak Prem Subramony

Background/Positionality

Like many individuals coming from the point in space and time where and when I was born and raised, I entered the ECT field quite by accident. As a budding print journalist in India back in the mid-1990s, I was starting to notice technology-driven changes on the horizon that appeared capable of changing my profession dramatically. I recall a visiting Fulbright Scholar from the United States at my school of journalism in New Delhi declaring, "In the future, all news reporters will need to have three indispensable tools at hand: a laptop computer, a digital camera, and a cellular telephone!" and me subsequently trying to contemplate a future in which someone in my shoes might possibly have access to such unimaginably high tech, high cost devices—while my classmates and I were still turning in handwritten assignments at j-school.

It was in this context that I encountered a newspaper advertisement posted by a Singapore-based software and multimedia company soliciting applications from "content creators"—which, according to the advertisement, included journalists—for several "instructional designer" positions based at their Bangalore, India, office. I applied mostly out of curiosity, was interviewed by a multinational panel of tech geeks, and, to my utter surprise, was hired. In classic "In 4 weeks YOU too can be an instructional designer!" fashion I soon found myself on site at an air force base in Singapore, using *ToolBook* software to design computer-based training (CBT)

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modules targeted at incoming National Servicemen.[1] The irony of being tasked with churning out one-size-fits-all instructional interventions aimed at uniform(ed) beings as my very first instructional systems design (ISD) job did not dawn on me until much later.

My suddenly transformed circumstances necessitated a speedy renegotiation of my relationship with educational and communications technologies. Getting to the point where I could (pretend to) be an instructional designer involved traversing multiple intermediate waypoints, such as setting up my first ever e-mail account, discovering the myriad joys of word processing, and trying my hand at rudimentary computer graphics; it would still be several years before I actually got to buy and own those three fabled pieces of technological hardware touted by the aforementioned Fulbright Scholar. I also had to adapt to operating in a dramatically more technocentric society (Singapore) than the one in which I had lived all my life thus far (India).

In another turn of fate, the incredibly kind and supportive mentor I was assigned to in Singapore perceived me to be particularly talented at designing CBT modules; the modules I was turning out were apparently of far higher quality than one would expect from someone who had undergone a mere month of ISD training. She subsequently advised me to consider pursuing a Master's degree in ISD in the West,[2] as a way to jumpstart and accelerate my career path by significantly developing and vastly expanding my ISD skills.

However, at the time I had all of US$5000 in savings to my name, which wouldn't get me very far even back in 1999, given the average tuition demanded by Western universities of international graduate students, not to mention the exorbitant costs of living in Western countries. When I was unable to find a university willing to underwrite my expenses to obtain a Master's degree in ISD, I ended up finding a way to enter through the back door—I succeeded in getting accepted with full funding to a Master's program in mass communication at a Big Ten institution in the United States, with a focus on "new media" along with a declared minor in ECT. I was subsequently able to leverage this Master's degree to obtain a 4-year fellowship to fully fund my Ph.D. in ECT at another Big Ten U.S. school.

Now my original plan had been to quickly get a Master's degree in the West and resume my career in corporate ISD, but attending the aforementioned Master's program made me realize that I really liked academic settings. Fast forward a few years and I managed to land an offer of a tenure-track faculty position at a university in the U.S. intermountain West 6 months before I defended my dissertation. I earned tenure 6 years later at a different university—having switched employers halfway through the customary probationary period—and then after four more years I

[1] See https://www.cmpb.gov.sg/web/portal/cmpb/home/about-us/discover-ns

[2] As Ghanaian-American philosopher Kwame A. Appiah notes, the noun "West" and adjective "Western" have meant different things at different times, but in recent years they mostly refer to the north Atlantic—i.e., Europe and its two wealthy English/French-speaking former North American colonies—along with Australia, New Zealand, and White South Africa; "Western" can thus look very much like a euphemism for "White" (Appiah, 2016).

eventually arrived at my current institution, where I presently serve as full professor of curriculum and instruction and coordinator of ECT graduate programs.

Perspective/Frame of Reference

I detailed my professional trajectory within the ECT field in the previous section of this chapter as a way to set the stage for further explicating the particular cultural and valuative perspective and frame of reference this chapter embodies. As human beings, our self-identities and our community identities underlie and influence what we do professionally, whether we choose to acknowledge this or otherwise. By virtue of being human, ECT scholars and practitioners are not culture- and value-free beings, as much as we might have historically aspired to objectivity and cultural/value neutrality as a field.

My self- and community identities can both be represented as Venn diagrams featuring multiple circles representing different, important aspects of who I am, listed here *not* in order of importance: cis(gender) man, gay, Brown, Hindu, able-bodied, (mostly) able-minded, middle-class, first-generation immigrant, non-prestige[3] accented English speaker, college-educated, white-collar professional, naturalized U.S. citizen, (same-sex) married, registered Democrat, university professor, etc. While a few of these circles may clearly overlap, many do so very little or not at all, which makes constructing a coherently unified self-identity especially difficult for someone like me. Rather than overlapping, many of these circles instead move forward and backward, like one can make circles do in a *Microsoft Office* document, becoming foregrounded or backgrounded according to the context I happen to inhabit at any given moment. This phenomenon can be explained by the concept of intersectionality, which I will devote time to further discuss as we get deeper into this chapter.

One of my most vivid memories from the first semester of my Ph.D. program in ECT was a discussion of the history of educational and communications technologies in which the professor presented Gutenberg's fifteenth-century German printing press as the first in human history to feature mechanical movable type. My ears perked up, since I had just visited the National Museum in Gyeongju, Korea, and marveled at a Korean movable type printing press that predated Gutenberg's invention. When I brought this up in class and asked why non-European/non-Western contributions to technological progress were not being discussed, the professor's response was "because those contributions have not been properly documented."

I consider this to be a pivotal a-ha moment in my career, because it determined my path forward as an ECT scholar-practitioner by inspiring me ask questions that precious few in the field had been asking thus far: Who has the power to decide what

[3] Prestige accent refers to the accent(s) of the dominant social group(s) speaking a given language (Fuertes et al., 2002); examples include Received Pronunciation (RP) a.k.a. the Queen's English (Hogenboom, 2018) and Standard American English (SAE).

to study and what to document within a given field, and thus to mold the entire field in their cultural image? Why does the historical narrative presented within U.S. ECT programs—in fact, U.S. education programs in general—seem to suggest that all worthwhile human thought about teaching, learning, and technology originated in ancient Greece, and subsequently progressed through ancient Rome, the European Renaissance, the Northern European Age of Enlightenment, the transatlantic Industrial Revolution, and finally the current, glorious Information Age spearheaded by Silicon Valley? Why do the contributions of non-Western societies to ECT seem to have been entirely ignored, along with the contributions of women? What impact do such unapologetic Eurocentrism and patriarchy have on someone who wishes to join the field while not being a cis White man?

The Elephant in ECT's Room

Gary C. Powell[4] was among the first in our field to notice that stakeholder diversity was not eliciting the attention it deserved within ECT texts, journals, and conferences (see Powell, 1997a). Subsequently, my own first detailed investigation of ECT's intellectual blind spot during the early 2000s also revealed a field almost wholly inattentive to the needs and issues facing culturally diverse stakeholders. Per my calculations (Subramony, 2004), less than 3% of articles published across six leading refereed ECT journals in 2002–2003 addressed stakeholder diversity, as did around 7% of chapters in AECT's 2003 *Handbook of Research for Educational Communications and Technology*. Besides, less than 3% of refereed sessions and none of the invited sessions at AECT's 2003 International Convention tackled diversity issues. Furthermore, when stakeholder diversity did appear within the curricula of ECT graduate programs, it did so as a mere footnote within the context of learner analysis.

Nearly a decade-and-a-half later, towards the close of the 8-year period of relative social/cultural progress the U.S. had experienced under President Obama, I formally revisited the issue of ECT's inattention to stakeholder diversity (Subramony, 2017). My inquiry soon made it disturbingly clear that, notwithstanding laudable efforts by reformist scholars over the intervening years, stakeholder diversity continued to be a firmly peripheral concern—a veritable sideshow—in the eyes of ECT's mainstream discourse, with most discussion of social/cultural questions relegated to special interest groups, special (journal) issues, and the like. In other words, rather than begin to elicit systemic interest across the field, the study of social/cultural issues in ECT instead continued to remain intellectually marginalized, segregated, and ghettoized within sharply circumscribed forums and circles.[5]

[4] See https://www.linkedin.com/in/drgcpowell/

[5] Please note study was published before AECT chose "Towards Culturally-situated Learning Design and Research" as the theme for its 2020 International Convention, held virtually during the thick of the Covid-19 pandemic. As many in our field came to notice, the wholesale shift to remote

Meanwhile, mainstream ISD texts continued to mention diverse and "special needs" learners in virtually the same breath—betraying longstanding deficit perceptions of stakeholder diversity that Powell (1997b) had recognized and highlighted two decades earlier—and courses devoted to exploring social/cultural issues in ECT continued to remain absent from the curricula of leading graduate programs within the field. See Subramony (2017) for further details.

Shortly afterwards, when I went on to investigate (Subramony, 2018) how much attention was being paid by ECT scholars to the needs and issues facing LGBTQI[6] stakeholders, the evidence I uncovered painted an even direr picture of neglect. As of mid-2017 the entire digital archive of *TechTrends* collectively featured all of three written pieces that mentioned LGBTQI stakeholders by name. Meanwhile, only one—i.e., 0.03%—of 2877 articles across the 65 volumes and 289 issues of *Educational Technology Research and Development* published from 1953 through mid-2017 featured a mention of LGBTQI issues. Besides, the 2001, 2004, 2008, and 2014 editions of AECT's *Handbook of Research for Educational Communications and Technology* failed to feature a single chapter focused on LGBTQI stakeholders across their 4000+ collective pages. See Subramony (2018) for more edifying examples in this vein.

Such systemic inattention to a given set of issues tends to be neatly self-perpetuating. Those within any academic field—and especially new entrants to it—are expected to copiously cite their peers and predecessors in their scholarly writings. Beginning scholars are taught to include extensive reviews of prior scholarly literature when reporting the results of new research. In a classic chicken and egg situation, it can be surprisingly difficult to report new findings with regard to a given set of issues if little prior research exists on said issues due to wholesale inattention towards them by members of one's field.

In fact, I ran into this exact problem when trying to write up my dissertation study focusing on the sociocultural impact of technology-rich K-12 schools on native Iñupiat learners in the Alaskan Arctic—at the time there was virtually no preexisting literature within ECT to cite on any comparable topic, and research on Iñupiat subjects by scholars from other disciplines was only tangentially related to what I was trying to explore. I was fortunate in being able to assemble a dissertation committee that could appreciate my problem and support me as I wrestled with it, but fortune should not have to play such a vital role in a new scholar being able to earn their credentials within the field.

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learning/work provoked by Covid-19 rapidly foregrounded stark inequities across social/cultural groups in access and competencies with regard to the technologies necessary to make such learning/work possible. That said, it remains to be seen if ECT's currently sharpened focus on equitable technological access does not simply subside in tandem with the Covid-19 pandemic.

[6] Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and Intersex. As of 2021 the initialism LGBTQQIA+ prevails; it features separate Qs for Queer and Questioning, along with A for Asexual, and a + sign to acknowledge additional groups—such as Pansexual, Nonbinary, etc.—who may not be served by the current set of initials.

Furthermore, ECT's scholarly playing field is rendered even more tilted/uneven by the field's predilection for constantly jumping onto "emerging" technological bandwagons—a manifestation of the unapologetically technocentric, as opposed to human-centric, perspective the field has traditionally espoused from its historical origins within the Western military-industrial sphere. To illustrate ECT's penchant for such bandwagons, British open education expert Martin Weller lists 20 "emerging phenomena" (Weller, 2018) that provoked annual excitement among the ECT community with almost comical predictability over the 20-year period from 1998 through 2017—the list features an array of seductive possibilities such as learning objects, Web 2.0, virtual worlds, MOOCs, digital badges, blockchain, and so on.

ECT's technocentrism allows technology to manipulate us instead of the other way round. Our appetite for technological bandwagons divests us of our power and agency to set our own scholarly and professional agendas. A pernicious outcome of our field's obsession with and entrancement by emerging technologies is that less "popular" topic areas such as stakeholder diversity consequently attract less interest/readership, elicit fewer citations, and ultimately generate lower h indices for scholars dedicated to exploring these topic areas—a matter of particular concern for beginning/early-career scholars trying to establish themselves in the field. To me, indices like h and i10 represent the ultimate example of tail wagging dog—a private, for-profit technological entity cleverly inventing and deploying artifices to make higher education dance to its tune, just as standardized testing firms succeeded in doing previously.

Acknowledging the Elephant

"We as a field have only recently become proficient enough to do harm," Thomas M. Schwen warned nearly two decades ago (2003, personal communication), alluding to: (a) ECT scholars' and practitioners' dramatically expanding reach to cover ever more hitherto un/under-served stakeholder populations as a consequence of increasing globalization, improved human mobility, and sweeping demographic shifts; (b) our continued ignorance of the hidden assumptions and strong cultural values that accompanied our work and our consequent failure to take on the social responsibility of making this self-evident to our audiences; and (c) our continued technological advocacy—which Schwen described as our field's "worst excess"—based on the idea of technology being value-free and thus immune to social criticism.

One thing we can learn from recent national and global crises is that technology is not what is holding us back from solving the world's seemingly intractable problems. We arguably already have the technology to solve most of the existential issues facing humanity today—from the trees needed to prevent the poorer parts of Phoenix, Arizona, from overheating[7] to the clean energy technologies needed to

[7] See https://www.youtube.com/watch?v=ZQ6fSHr5TJg&t=5s

avert catastrophic climate change. A nation inventive enough to conjure up 50 kinds of cladding for exterior walls[8] certainly has the technology needed to solve its affordable housing crisis.[9] When the Covid-19 pandemic hit, the world's pharmaceutical firms were able to come up with multiple, miraculously effective vaccines in record time. What is truly holding us back from solving our planet's problems are our societal values—specifically our public policies, which are essentially our societal values operationalized. Besides, as the late Chet Bowers[10] and others have emphasized long ago (see Bowers, 2000; Bowers, Vasquez, & Roaf, 2000), these same values are also embedded in the technologies we create and advocate, which is why technologies oftentimes, depending on the cultural contexts within which they are deployed, become more of a problem than a solution (see Subramony, 2006, 2021). Ergo, I must emphasize we as a field need to move away from our overwhelmingly technocentric worldview and instead shift our focus onto societal values and public policies as a reflection of the former.

Addressing the Elephant

Ever since the epiphanic a-ha moment I experienced as a first-year doctoral student 20 years ago, I have made it my scholarly and professional focus to push the ECT field towards cognizance, responsiveness, and inclusivity with regard to the increasingly diverse stakeholders coming under our purview. It has often felt like a rather lonely journey, given how peripheral my concerns have been to the field's mainstream, but I have also been able to find my home among a close-knit community of like-minded reformists—the AECT affiliate Minorities in Media (MIM), which subsequently morphed into AECT's Culture, Learning, and Technology (CLT) Division. I also had the honor of being elected president of both bodies. Nevertheless, the issue I mentioned earlier has persisted for most of my time in this field, i.e., stakeholder diversity has mostly been of interest to a small, self-selected group of individuals, and is rarely addressed outside of conference presentations and special journal issues facilitated by this group. In this context, AECT's move to name "Towards Culturally-situated Learning Design and Research" as the theme for its 2020 International Convention has been a very hopeful development, but as I cautioned, we have yet to see how long the current spike of interest in issues of equitable technological access will persist once the pandemic stops making daily headlines.

As a field we need a wholesale shift in perspective from technocentric to human-centric, and start looking at our stakeholders holistically as living, breathing, feeling humans. As I remind the pre- and in-service teachers I teach, giving kids iPads will

[8] See https://www.youtube.com/watch?v=Ml-ZP-_e_o4&t=3s

[9] See https://www.youtube.com/watch?v=0Flsg_mzG-M&t=2s

[10] See https://cabowers.net/index.php

not make much of an impact cognitively or motivationally if they are coming to class hungry; in this case, food would be a more appropriate performance intervention. Holistic ECT praxis will also require us to stop thinking in binaries—black/white, male/female, gay/straight, cis/trans, rich/poor, abled/disabled, and so on. First of all, these are not binaries, these are continuums; secondly, as Kimberlé W. Crenshaw's concept of intersectionality (see Crenshaw, 1991) reveals, each of these operates as a dimension/layer of privilege or oppression—depending upon where on you fall within each continuum—and these dimensions/layers compound, mitigate, or clash with each other. Our stakeholders represent complex beings at the intersection of these dimensions/layers, and ergo we cannot hope to appropriately address their needs/issues if we choose to ignore any of these.

As a field we also need to understand and acknowledge our tremendously privileged position. This can be difficult to accomplish; as Peggy McIntosh implied with her concept of the "invisible knapsack" of privilege (see McIntosh, 1988), by default we humans tend to be oblivious to our own privilege. To begin with, we need to recognize all social research and scholarship as being intrinsically political (see Hammersley, 2000). Furthermore, we need to be cognizant of the myriad additional dimensions of our privilege as ECT scholars/practitioners, such as our privileged access to resources bestowed by our prestigious institutional affiliations; our privilege to create ECT solutions aimed at countless others in our own cultural image; and our power to extract data from underrepresented and underserved stakeholder groups at low-to-no cost and subsequently sell our high-cost manufactured ECT solutions and services back to them—also known as digital colonialism (see Kwet, 2019).

Meanwhile, as David Gaider famously said, privilege is "when you think that something's not a problem because it's not a problem for you personally" (Wilde, 2013). This should remind the ECT community to not let our own privileges blind us to the plight of our stakeholders who very likely may not share said privileges. Ignoring the fullness of the humanity of the complex, intersectional beings our services and solutions impact by discounting key elements of their self- and community identities oppresses our stakeholders. This risks eventually alienating them, as Paul Willis explained, and provokes them to construct said identities in opposition to us (see Willis, 1977) as acts of righteous resistance, which can be counterproductive and put them at risk of further marginalization. Should our praxis perpetuate alienation and resistance among our most vulnerable stakeholders, potentially trapping them within a vicious cycle of further alienation and marginalization, or can we modify our praxis to turn that cycle into a virtuous spiral of inclusion and empowerment? I trust most of us would prefer the latter option.

Finally, ECT needs make a final push to take its longstanding, laudable journey away from the limited perspective exemplified by the linear, lockstep ISD models of yore towards a more systemic worldview—a journey so brilliantly described decades ago by Shirl Schiffman (1986) and a shift long championed by Charles M. Reigeluth and his team (see Joseph & Reigeluth, 2010) who have spent years tirelessly advocating for systemic change in place of piecemeal tinkering—to its logical destination, which is a consensual understanding and acceptance of the idea

that learning and performance are not limited to the classroom or workplace alone, but rather are the result of a considerably wider array of factors—because the education system under whose purview the issues of learning and performance traditionally come is itself but a subsystem situated at the intersection of the much larger social, economic, political, and cultural systems. Michael H. Molenda and I recently published a "Framework of the Forces Affecting Instructed Learning" (see Molenda & Subramony, 2021) that attempts to flesh out this idea in comprehensive detail. We see this as merely a first attempt at trying to comprehend and account for the myriad variables that must be taken into account by ECT professionals and others in the education/training sphere in order to truly facilitate effective teaching, meaningful learning, and optimal performance.

References

Appiah, K. A. (2016, November 9). *There is no such thing as western civilisation*. Retrieved from https://www.theguardian.com/world/2016/nov/09/western-civilisation-appiah-reith-lecture

Bowers, C. A. (2000). *Let them eat data*. The University of Georgia Press.

Bowers, C. A., Vasquez, M., & Roaf, M. (2000). Native people and the challenge of computers: Reservation schools, individualism, and consumerism. *American Indian Quarterly, 24*(2), 182–199.

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review, 43*(6), 1241–1299.

Fuertes, J. N., Potere, J. C., & Ramirez, K. Y. (2002). Effects of speech accents on interpersonal evaluations: Implications for counseling practice and research. *Cultural Diversity and Ethnic Minority Psychology, 8*(4), 346–356.

Hammersley, M. (2000). *The politics of social research*. SAGE Publications Ltd.

Hogenboom, M. (2018, March 9). *What does your accent say about you?* Retrieved from https://www.bbc.com/future/article/20180307-what-does-your-accent-say-about-you

Joseph, R., & Reigeluth, C. M. (2010). The systemic change process in education: A conceptual framework. *Contemporary Educational Technology, 1*(2), 97–117.

Kwet, M. (2019). *Digital colonialism is threatening the global south*. Retrieved from https://www.aljazeera.com/opinions/2019/3/13/digital-colonialism-is-threatening-the-global-south

McIntosh, P. (1988). *White privilege and male privilege: A personal account of coming to see correspondences through work in women's studies*. Wellesley College Center for Research on Women.

Molenda, M. H., & Subramony, D. P. (2021). *The elements of instruction: A framework for the age of emerging technologies*. Routledge.

Powell, G. C. (1997a). Diversity and educational technology: Introduction to special issue. *Educational Technology, 37*(2), 5.

Powell, G. C. (1997b). On being a culturally sensitive instructional designer and educator. *Educational Technology, 37*(2), 6–14.

Schiffman, S. S. (1986). Instructional systems design: Five views of the field. *Journal of Instructional Development, 9*(4), 14–21.

Subramony, D. P. (2004). Instructional technologists' inattention to issues of cultural diversity among learners. *Educational Technology, 44*(4), 19–24.

Subramony, D. P. (2006). Culturally and geographically relevant performance interventions: A case study from Arctic Alaska. *Performance Improvement Quarterly, 19*(2), 115–134.

Subramony, D. P. (2017). Revisiting instructional technologists' inattention to issues of cultural diversity among stakeholders, Ch. 3. In J. L. Joseph & R. Moore (Eds.), *Culture, learning, and technology: Research and practice* (pp. 28–43). Routledge.

Subramony, D. P. (2018). Not in our journals—Digital media technologies and the LGBTQI community. *TechTrends: Linking Research and Practice to Improve Learning, 62*(4), 354–363.

Subramony, D. P. (2021). On being proficient enough to do (no) harm, Ch. 9. In I. Lubin (Ed.), *ICT and international learning ecologies: Representation and sustainability across contexts* (pp. 179–202). Routledge.

Weller, M. (2018). Twenty years of edtech. *EDUCAUSE Review, 53*(4), 34–48.

Wilde, T. (2013, March 29). GDC 2013: BioWare's David Gaider asks, "How about we just decide how not to repel women?" Retrieved from PC Gamer website: https://www.pcgamer.com/bioware-david-gaider-sex-in-video-game/

Willis, P. (1977). *Learning to labor: How working class kids get working class jobs*. Columbia University Press.

Expanding the Horizon: Formative Evaluation of Vocational Training Simulation Designed for Students with Intellectual Disabilities

Sanghoon Park, Jeeheon Ryu, Yeonju Tak, Seo-bin Jo, and Daeun Kim

An intellectual disability (ID) is a type of disability with limitations in both intellectual functioning and adaptive behavior that affect social/practical skills (Schalock et al., 2021). Since the United Nations (2007) recognized the rights of people with ID to work equally in a labor market (United Nations General Assembly, 2007), many government agencies and policymakers have been working on initiatives to support meaningful employment opportunities for those with ID (Barczak & Cannella-Malone, 2021).

For example, the European Directive on Equal Treatment in Employment and Occupation bans discrimination in the workplace or vocational training against people with ID (Council of the European Union (CEU, 2000). In America, federal law prohibits discrimination against individuals with impairments that substantially limit a major life activity or who have a disability (American with Disabilities Act [ADA] Amendments Act, 2008). Similar to ADA, the Employment Promotion and Vocational Rehabilitation Act for People with Disabilities in South Korea promotes the participation of persons with disabilities in economic activities, yet approximately 80% of them are not employed (Korea Employment Agency for the Disabled [KEAD], 2018).

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However, the employment rate of disabled people across the world is higher than the average employment rate. For example. Only 17.9% of persons with a disability were employed in the U.S. (down from 19.3% in 2019) while the unemployment rate has increased to 12.6% in 2020 (U.S. Department of Labor [USDOL] news release, 2021). The jobless rates for Hispanics (16.8%), Blacks (16.3%), and Asians (15.7%) were higher than the rate for Whites (11.6%) in 2020. In South Korea, the employment rate of persons with a disability was 34.5% in 2019, which is considerably lower than the national average of 60.9% (Korean Statistics Office, 2020).

Previous studies found considerable reasons for the inequality in employment rates, such as discrimination by employers (Houtenville & Kalargyrou, 2015) and low expectations from family members or educators (Doren et al., 2012), which resulted in the lack of appropriate accommodation facilities that are necessary for people with disabilities to find/maintain their working positions. (Lee & Seo, 2014). The discrimination and low expectations not only contribute to the inequality in employment rates in the community and workplace but also cause secondary level students with ID not to be prepared to work in the community. Secondary schools are facing challenges in offering vocational training programs that prepare students with ID to successfully learn vocational skills and make a transition to the workplace. Consequently, students with ID graduate high school without acquiring necessary vocational skills, which challenges them to find employment opportunities (Carter et al., 2009, 2016; Newman et al., 2011; Test et al., 2014).

Vocational Training Simulation for Students with Intellectual Disabilities

Students with ID often require vocational training and prompts to learn job-related skills (Sauer et al., 2010), but they do not easily integrate information into already-learned sequences. To increase variation in training activities and provide diverse training contexts, vocational training needs to be designed to support authentic experience in real-world environments, which improves necessary skills and work outcomes for future employment (Kerka, 1997). Virtual Reality (VR) simulations have been considered as an effective approach to simulate real-life situations for students with ID and help enhance building routine performance process for recursive tasks (da Cunha et al., 2018; Newbutt et al., 2016; Tam et al., 2005). Students with ID can practice the skills repeatedly without worrying about making mistakes in a safe virtual environment. Also, VR is suitable for students with ID as it allows them to adjust their training pace based on their level of disabilities (Tam et al., 2005). da Cunha et al. (2018) found in their review that 61% of the studies show VR as an effective intervention for training persons with autism, intellectual disabilities, and other cognitive disorders. Previous studies also show that VR simulation supports training for independent living skills, exercise activities, daily life skills learning, and vocational education (Panerai et al., 2018; von Barnekow et al., 2017). A

key aspect of VR simulation is the design of real-world scenarios. Well-designed scenarios offer safe, repeatable, and targeted training activities that focus on improving job-related skills as well as social and practical skills (Park & Ryu, 2019). Various scenarios create realistic interactions for students with ID to follow a series of practices before attempting real tasks.

In this chapter, we present the design and development of a VR vocational training simulation for students with ID. The simulation was designed based on Merrill's (2020) first principles of instruction — activation, demonstration, application, and integration—that provided the foundation for the universal design for learning (UDL) principles.

Design Considerations for VR Vocational Training Simulation for Students with ID

Many current instructional theories suggest that problem-centered learning environments offer effective learning experiences. According to Merrill (2020), problem-centered learning promotes learners to acquire knowledge and skills by solving real-world problems or tasks. Merrill (2020) further suggested the four distinct phases of learning, which are activation of prior experiences, demonstration of skills, application of skills, and integration of learned skills into research-word tasks. In our design of VR simulation, the first principles of instruction were applied by adding eight activity verbs to offer activities considering students' cognitive characteristics to guide gradual approaches for the students with ID to build a skill routine. Table 1 describes each stage of the principles and corresponding student activities and descriptions.

As the table explained, for "activation," we created an activity that aims to achieve "list" and "recognition" by completing tasks such as "List how to deal with real-life problems through a video to activate background knowledge" and "Recognize the appropriate problem-solving process." Also, we applied a

Table 1 Description of the activities that take place in each principle

Instructional activity stage		Descriptions
Recognize	Recognize the appropriate problem-solving process.	
Demonstrate	1	Recall the expert problem-solving process shown as a demonstration.
		Clarify while practicing the problem-solving process.
Apply		Carry out the problem-solving process in the problem situation without demonstration.
		Evaluate the performance by themselves.
Integrate		Predict the appropriate problem-solving process and the consequences for other problems.
		Use the appropriate problem-solving process in other problems.

worked-out example to help learners with ID construct a problem-solving schema. Specifically, we performed a task analysis to complete training tasks and set up a worked-out example to build a set of skills.

We also implemented an evaluation module with guided observation for teachers to assess the progression of building a set of skills. In the VR simulation, the guiding function supports the students with ID to manage cognitive loads in the worked-out problem by offering just-time guidance when students need support to complete a task. Observation is often used for monitoring the change or progress of a student's behaviors over time. Hence, guided observation offers a proper approach for teachers to provide necessary feedback while minimizing pre-planned procedures.

We then reconstruct eight activity categories to offer design guidelines for students' cognitive experiences in the virtual simulation based on Merrill's First principles of instruction. Figure 1 shows the design model we used to create the virtual simulation.

In addition to the first principles of instruction, we applied Renkl's worked-out example (WOE) (Renkl, 1997) to help learners with ID construct a problem-solving schema (Fig. 2). WOE offers learners specific examples of expert-level problem-solving. The example of the best problem-solving cases can help students create a schema while they are practicing them. Since learners with ID have difficulties in solving problems, using WOE can support them develop a schema more effectively through self-explanation (Renkl, 2002). Previous studies have shown the positive effects of using the WOE approach on the performance and problem-solving skills

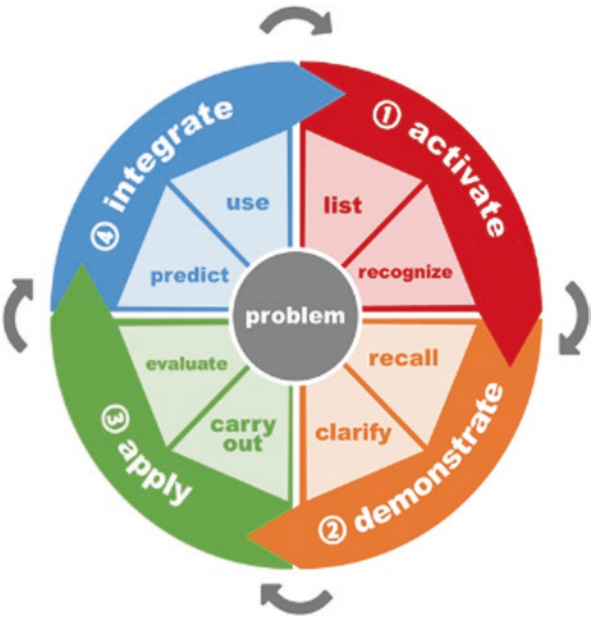

Fig. 1 A design model by reconstructed First principles of instruction

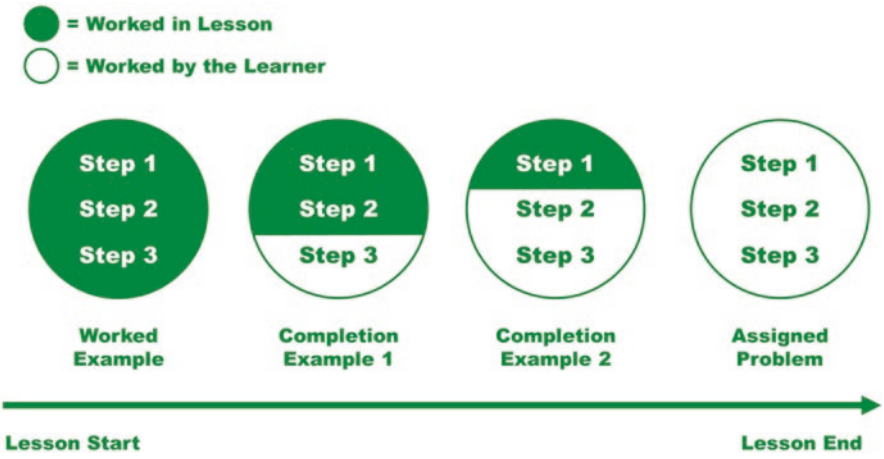

Fig. 2 Transitioning from worked examples to problem assignments. (Clark et al., 2011)

of students with ID (Chung & Tam, 2005; Lee et al., 2010). Mulder et al. (2014) also reported that using WOE in a computer simulation environment promoted students' inquiry-based learning outcomes.

Task analysis was conducted to complete job training and set up four stages: (1) identify what to do, (2) select a primary action for the task, (3) perform the task correctly, and (4) check out the performance (Fig. 3).

In the simulation, students begin the given training scenarios by following the demonstration stage where they can acquire the necessary skills to complete a task through modeling the expert steps that are eventually faded out. Then in the application stage, students perform all the steps without viewing any examples. First, they identify the training goal/problem presented in the VR in the form of a video clip. Second, they find out a solution to the given scenarios and decide what actions to take. Third, the students perform necessary actions to complete the scenario tasks, and lastly, they review their performance to understand what actions need to be further added or removed. For example, one of the VR scenarios "Wiping out a table scenario" is designed to train how to clean a table in a VR convenience store. In the "Wiping out a table scenario," students first recognize that the customer is unhappy with the dirty table (Identify), select the appropriate cleaning tool (Select), clean the table (Perform), and review their performance (Check).

Simulation Design

This simulation was created in Unity3D and Oculus Rift S to be used with Head Mounted Display (HMD) and two controllers (Fig. 4). Users can observe their surrounding areas, pick up necessary items to complete a task using a controller.

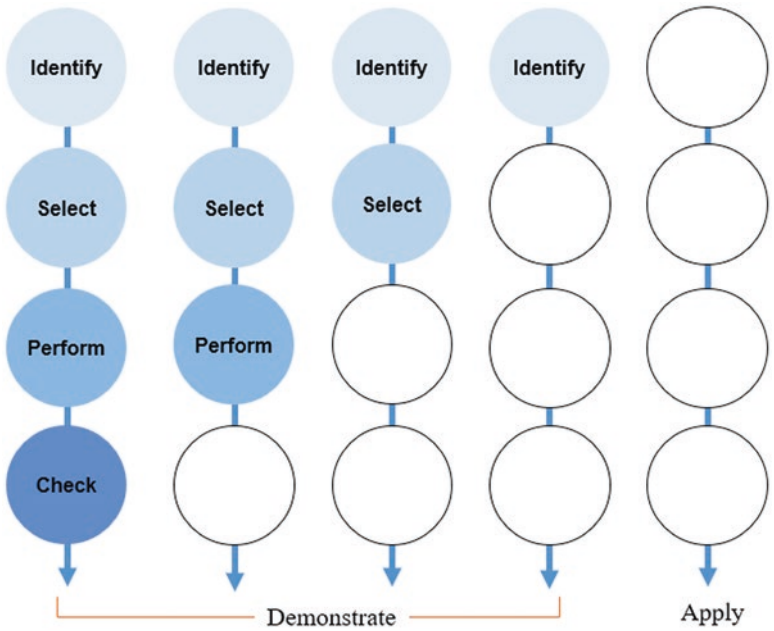

Fig. 3 Task design

Fig. 4 Oculus Rift S touch controller

Considering the target users of the simulation who are students with ID usually experiencing challenges in using a controller, we designed the simulation on a room-scale so that users can walk around as they are in the real working environment. In addition, the avatars in the simulation were developed using Daz3D and iClone 7. The avatar voice was generated using the Text-To-Speech (TTS) service of Naver Clova.

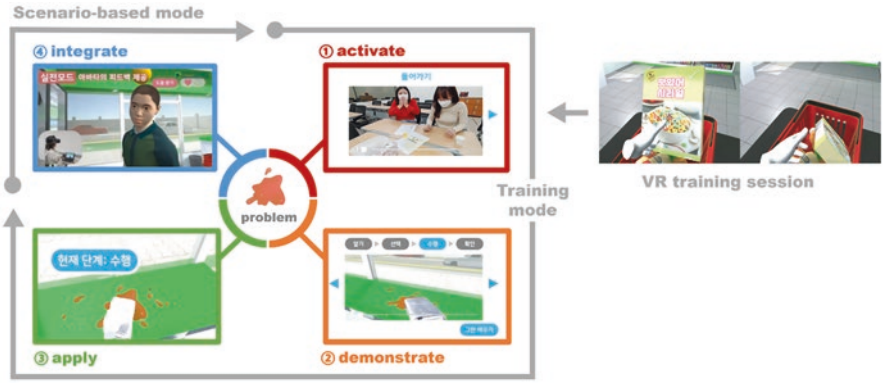

Fig. 5 The simulation framework

The VR simulation consists of three components: VR practice session, Guided-training mode, and Scenario implementation mode. The "VR practice session" offers users basic training on how to operate VR devices/controllers. In the "Guided-training mode," users learn how to complete training goals/problems through activating, demonstrating, and applying training actions (Fig. 5). Specifically, users view a video clip presenting how to perform the problems solving in real life that can help activate their background knowledge. They also observe how an expert solves the problem in simulations. Lastly, users try to achieve the training goal by solving the given problem. Completing the training mode, they are given a different problem situation in the "Scenario implementation mode" where they can practice the learned problem-solving strategies in a different context.

Users solve real-life problems through scenarios involving interactions with virtual customer avatars. Users are engaged with interactions with a customer avatar and given a simulated problem that they need to solve. If a user experiences any trouble, the help button is available for any necessary support or information for successful task completion. At the end of the scenario, additional simulations are available for performance evaluation. Users' performance is evaluated while in the "Scenario implementation mode" in which they practice the learned problem-solving strategy in different problem situations.

Formative Evaluation

Before testing the VR simulation for students with ID, we conducted a formative evaluation of the simulation design with five special education teachers to identify the areas of simulation task load problems.

Recruitment

Five in-service special education teachers in the southern providence in South Korea were recruited to ensure that the designed menus function as expected, and the level of anticipated students' task loads in the simulation environment is low. The five participants were selected based on their expertise in teaching students with special needs. They visited the simulation lab where they followed the evaluation process by reviewing the simulation description, watching the simulation video clip, completing the simulation task load questionnaire, and providing written comments.

Instruments

The formative evaluation questionnaire contained ten items with five-point Likert scales based on the simulation task load index (SIM-TLX) (Harris et al., 2020). SIM-TLX was used in this validation process because it measures task load in a virtual reality-based simulation environment (Sudiarno, 2020; Harris et al., 2020).

Findings

Table 2 shows combined review findings from the questionnaire. The mean score of task load (items 1–9) was 2.5, indicating that students would experience less level of task load than normally they are expected to experience. The mean score of the

Table 2 Means and standard deviations for formative evaluation questionnaire (SIM-TLX)

N	Evaluation category	Description	*M*	*SD*
1	Mental demands	How mentally fatiguing was the task?	2.40	0.89
2	Physical demands	How physically fatiguing was the task?	2.20	0.84
3	Temporal demands	How hurried or rushed did you feel during the task?	2.60	1.14
4	Frustration	How insecure, discouraged, irritated, stressed or annoyed, were you?	2.60	1.14
5	Task complexity	How complex was the task?	2.20	0.84
6	Stress	How stressed did you feel while performing the task?	2.00	0.00
7	Distraction	How distracting was the task environment?	3.20	1.10
8	Perceptual strain	How uncomfortable/irritating were the visual and auditory aspects of the task?	3.00	1.00
9	Task control	How difficult was the task to control/navigate?	2.40	0.89
10	Presence/ immersion	How immersed/present did you feel? In the task?	4.00	0.71

Note. *M* indicates mean. *SD* indicates standard deviation. Possible score range: 1–5

presence questionnaire was 4.00, suggesting that the simulation was designed to provide users with a high level of immersive experiences. Participants also commented that the task environment was somewhat distracting because the control of actions required multiple controls of two trigger keys and joysticks. They also noted that including additional guides for user performance was irritating as it distracted their attention to the given tasks.

Discussion and Future Directions

In this chapter, we shared a design case of a virtual reality-based vocational training simulation that was designed and developed to support vocational training for students with ID in South Korea. Two instructional design models, the first principles of instruction and WOE, were considered as a design framework for the simulation. In the formative evaluation phase, the task load of performing the simulation activities was reviewed by five in-service special education teachers.

The findings indicated overall positive responses showing a lower level of task load than normal. Two aspects of simulation, distraction, and perceptual strain, were suggested for further improvement. Further analysis of reviewers' written comments showed that controlling joystick operation would be too complicated for students with ID because two trigger keys have to be used at the same time to move or rotate a virtual character. One way to improve the joystick controller operation would be to use a room-scale control in which users are allowed to walk around at their own pace to experience the simulation space, instead of only using controllers. The walking experience in the VR space would increase users' perception of spatial location and further create a realistic and immersive experience. For example, the "Wiping out a table scenario" in a convenience store needs to represent the size and complexity of a real context in the VR simulation so that students with ID can experience a usual level of distractions that are necessary to increase the authenticity of their tasks.

Reviewers also suggested that the user interface needs to be improved to provide better instructional guidance. It was noted that users might have difficulty in communicating with a classroom teacher because they are unable to talk while experiencing the simulation with a head-mounted display (HMD). The perceptual strain might confuse an instructional guide for a teacher. Besides, concerning the assessment of performance proficiency, our current evaluation module presents simple feedback on the completion of a task. The future study will consider the formative evaluation findings to improve the usability and simulation scenarios. Also, enriched behavioral data such as task completion time or students' action sequence will be integrated into the simulation to gain better performance and evaluation information.

References

ADA Amendments Act. (2008). *The Americans with disabilities act amendments act of 2008*. Retrieved from: https://www.eeoc.gov/statutes/americans-disabilities-act-amendments-act-2008

Barczak, M. A., & Cannella-Malone, H. I. (2021). Self-management of vocational skills for people with significant intellectual disabilities: A systematic review. *Journal of Intellectual Disabilities (online first)*, 1–21. https://doi.org/10.1177/1744629520987768

Carter, E. W., Trainor, A. A., Cakiroglu, O., et al. (2009). Exploring school-business partnerships to expand career development and early work experiences for youth with disabilities. *Career Development for Exceptional Individuals, 32*, 145–159.

Carter, E. W., Blustein, C. L., Bumble, J. L., et al. (2016). Engaging communities in identifying local strategies for expanding integrated employment during and after high school. *American Journal on Intellectual and Developmental Disabilities, 121*, 398–418.

Chung, K. K., & Tam, Y. H. (2005). Effects of cognitive-based instruction on mathematical problem solving by learners with mild intellectual disabilities. *Journal of Intellectual and Developmental Disability, 30*(4), 207–216.

Clark, R. C., Nguyen, F., & Sweller, J. (2011). *Efficiency in learning: Evidence-based guidelines to manage cognitive load*. John Wiley & Sons.

Council of the European Union [CEU]. (2000). *European directive on equal treatment in employment and occupation*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32000L0078

da Cunha, R. D., Neiva, F. W., & da Silva, R. L. D. S. (2018). Virtual reality as a support tool for the treatment of people with intellectual and multiple disabilities: A systematic literature review. *Revista de Informática Teóricae Aplicada, 25*(1), 67–81.

Doren, B., Gau, J. M., & Lindstrom, L. E. (2012). The relationships between parent expectations and postschool outcomes for adolescents with disabilities. *Exceptional Children, 79*(1), 7–23. https://doi.org/10.1177/001440291207900101

Harris, D., Wilson, M., & Vine, S. (2020). Development and validation of a simulation workload measure: The simulation task load index (SIM-TLX). *Virtual Reality, 24*(4), 557–566.

Houtenville, A., & Kalargyrou, V. (2015). Employers' perspectives about employing people with disabilities: A comparative study across industries. *Cornell Hospitality Quarterly, 56*, 168–179.

Kerka, S. (1997). Constructivism, workplace learning, and vocational education. *Adult career and vocational education*. Accessed Eric Digest ED40757. https://files.eric.ed.gov/fulltext/ED407573.pdf

Korea Employment Agency for the Disabled. (2018, September 10). *2018 people with disability statistics digest*. https://edi. kead.or.kr/BoardType01.do?bid=1&mid=21&cmd=_list

Korean Statistics Office. (2020). *Employment rate*. Retrieved from http://www.index.go.kr/unify/idx-info.do?idxCd=8008

Lee, J. S., & Seo, J. H. (2014). The effects of the disability anti-discrimination law on the job tenure of disabled workers: Focusing on the mediating effects of job satisfaction. *Disability & Employment, 24*(2), 67–95. https://doi.org/10.15707/disem.2014.24.2.003

Lee, S., Cho, A., & Kee, C. (2010). Integrated waypoint path generation and following of an unmanned aerial vehicle. *Aircraft Engineering and Aerospace Technology, 82*(5), 296–304.

Merrill, M. D. (2020). *First principles of instruction* (revised ed.). AECT.

Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and practice*. Center for Applied Special Technology.

Mulder, Y. G., Lazonder, A. W., & de Jong, T. (2014). Using heuristic worked examples to promote inquiry-based learning. *Learning and Instruction, 29*, 56–64.

Newbutt, N., Sung, C., Kuo, H.-J., Leahy, M. J., Lin, C.-C., & Tong, B. (2016). Brief report: A pilot study of the use of a virtual reality headset in autism populations. *Journal of Autism and Developmental Disorders, 46*(9), 3166–3176.

Newman, L., Wagner, M., Knokey, A.-M., et al. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school: A report from the National Longitudinal Transition Study-2 (NLTS2) (NCSER 2011–3005)*. SRI International.

Panerai, S., Catania, V., Rundo, F., & Ferri, R. (2018). Remote home-based virtual training of functional living skills for adolescents and young adults with intellectual disability: Feasibility and preliminary results. *Frontiers in Psychology, 9*, 1730.

Park, S., & Ryu, J. H. (2019). Exploring preservice teachers' emotional experiences in an immersive virtual teaching simulation through facial expression recognition. *International Journal of Human-Computer Interaction, 35*(6), 521–533.

Rao, K., Smith, S. J., & Lowrey, K. A. (2017). UDL and intellectual disability: What do we know and where do we go? *Intellectual and Developmental Disabilities, 55*(1), 37–47. https://doi.org/10.1352/1934-9556-55.1.37

Renkl, A. (1997). Learning from worked-out examples: A study on individual differences. *Cognitive Science, 21*(1), 1–29.

Renkl, A. (2002). Worked-out examples: Instructional explanations support learning by self-explanations. *Learning and Instruction, 12*(5), 529–556.

Sauer, A. L., Parks, A., & Heyn, P. C. (2010). Assistive technology effects on the employment outcomes for people with cognitive disabilities: A systematic review. *Disability and Rehabilitation: Assistive Technology, 5*, 377–391.

Schalock, R. L., Luckasson, R., & Tassé, M. J. (2021). *Intellectual disability: Definition, diagnosis, classification, and systems of supports* (12th ed.). American Association on Intellectual and Developmental Disabilities.

Shin, Y. J., & Song, H. D. (2020). Development of flipped-learning instructional design principles based on first principles of instruction for vocational high school. *Journal of Educational Technology, 36*(4), 1087–1124.

Sudiarno, A. (2020). Analysis of human factors and workloads in earthquake disaster evacuation simulations using virtual reality technology. In IOP Conference Series: *Materials Science and Engineering,* 1003(1), 012082.

Tam, S. F., Man, D. W. K., Chan, Y. P., Sze, P. C., & Wong, C. M. (2005). Evaluation of a computer-assisted, 2-D virtual reality system for training people with intellectual disabilities on how to shop. *Rehabilitation Psychology, 50*(3), 285.

Test, D. W., Smith, L., & Carter, E. W. (2014). Equipping youth with autism spectrum disorders for adulthood: Promoting rigor, relevance, and relationships. *Remedial and Special Education, 35*, 80–90.

United Nations General Assembly. (2007). *Convention on the Rights of Persons with Disabilities : resolution / adopted by the General Assembly*. Retrieved from https://www.refworld.org/docid/45f973632.html

United States Department of Labor [USDOL]. (2021). *Persons with a disability: Labor force characteristics summary* [press release]. https://www.bls.gov/news.release/pdf/disabl.pdf

van Vonderen, A. (2004). Effectiveness of immediate verbal feedback on trainer behavior during communication training with individuals with intellectual disability. *Journal of Intellectual Disability Research, 48*(3), 245–251.

Von Barnekow, A., Bonet Codina, N., & Tost Pardell, D. (2017). Can 3D gamified simulations be valid vocational training tools for persons with intellectual disability? A pilot based on a real-life situation. *Methods of Information in Medicine, 56*(2), 162–170.

On the Persistence of Pages

Hal Hinderliter

Half a century ago, gaining access to scholarly sources meant purchasing a printed book or trudging to the library. Today, universities typically facilitate access to previous scholarship through online repositories of journal articles saved in the Portable Document Format (PDF), while teachers routinely distribute texts to their students by posting PDFs to learning management systems. Despite such ubiquity, however, the phenomenon of digital text distribution remains under-researched. Practices around the distribution of digital texts face a specific set of challenges in academia, where issues of access and equity must be considered. In addition to the moral principles involved, the potential liability for failing to provide an equitable experience for all learners is a very real concern. Litigation has often been used to settle issues of access, including high-profile lawsuits at MIT, Harvard, and UC Berkeley. This threat of legal action provides an impetus for each institution to pro-actively evaluate its practices around document distribution, with the goal of providing a legally mandated equivalent experience for users who rely on assistive technologies.

If we agree with Kranzberg (1986) that the social and political impacts of technology are never neutral, academia's pervasive use of the PDF format for document exchange must be producing an impact worthy of examination. Research suggests that users of assistive technologies (AT), as well as moderately impaired individuals who use the accessibility capabilities of their smartphones, find working with PDF files to be troublesome and inconsistent (Accessibility at Penn State, n.d.; Briggs, 2016; Johnson, 2014). The PDF format has been identified as a suboptimal choice for learners with disabilities (Alliance for the Equality of Blind Canadians, 2017; Australian Human Rights and Equal Opportunity Commission, 2014; Narup, 2013).

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The affordances of the PDF format, engineered to faithfully reproduce the layout of printed pages for the benefit of sighted readers using large-screen devices, have led to PDF's widespread adoption by readers, authors, publishers, and teachers. However, a fundamental flaw described in this study – that the PDF format's faithful recreation of printed pages privileges the "typical" reader while disadvantaging those who rely upon assistive technologies – compels us to closely examine both our operationalized text-sharing practices and their possible alternatives.

Due to its ubiquity, some educators may assume that the PDF format is inherently accessible. Perhaps they have seen a demonstration of a PDF being read aloud by a computer-synthesized voice or have heard of efforts to promote the PDF/A format for accessible PDFs. Commercial software companies tout the availability of these "accessible PDFs," but the complex process by which such PDF files are made accessible requires specialized software and is a completely voluntary act for the author, even as each PDF's remediation history remains opaque to potentials readers. As an adaptation of Adobe's PostScript page description language, PDF files are well suited for complex page layouts. However, text does not reflow when screen size or orientation is changed (forcing users to scroll or zoom in or out) because each PDF page is based on specified horizontal and vertical dimensions. The code for each page must be rendered through PostScript interpretation software to assemble its contents, adding significant overhead to the process of displaying text and graphics on screen.

Instead of this complex and inconsistently applied remediation process for the typical, i.e., difficult to access via assistive technologies, PDF, visually impaired users and the organizations who represent them have been advocating for the use of EPUB (not an acronym) documents. EPUB is an open-standard HTML-based portable document format that was designed for accessibility but is also appealing to sighted users. EPUB documents provide easy navigation and allow users to modify font size and typeface selection for easier reading; they can also be read aloud by text-to-speech "screen reader" software, and the document's contents can be easily communicated through other assistive technologies. The EPUB format supports full-color graphics, audio and video content, and reflowable text that adjusts to the reading device's orientation or screen dimensions.

The objective of the current research is to support improved practices for digital document exchange. In particular, it questions why our normalized practices are so resistant to change, i.e., *Why do we continue to prefer PDF's geometrically bound pages for document exchange when more accessible formats are available?* Both EPUB and PDF have their origins in the early 1990s, yet the latter has become ubiquitous while the former still struggles for recognition. This situation deserves further examination, given that disability advocates and organizations have called for the adoption of EPUB as an ideal document exchange format that can be fully enjoyed by sighted audiences as well as those who use assistive technologies (DAISY Consortium, 2011; Kerscher, 2015; Seaman, 2011). While multiple technical and economic issues are relevant to the larger discussion around the choice

of PDF versus EPUB (e.g., the poor quality of early EPUB conversions, inconsistent nomenclature, Adobe's power within the academic marketplace, the new workflow required, issues with page numbering), the current research will restrict itself to the underlying cultural aspects of this exigency. Through a synthesis of literature and theories related to our status quo, the current study grounds academia's adoption of the PDF format within a social framework.

To better understand the implications of file formats on academic discourse, it is necessary to look back at a time before our choices became operationalized. From the dawn of the desktop publishing era in the mid-1980s, some researchers considered the implications of replacing the printing page with electronic media. Others sought to define fundamental concepts that were suddenly being redefined by digital publishing, e.g., genre and authorship. This opinion piece references a selected few of these important theoretical contributions to remind us that the status quo is still nascent and our choices still malleable. The review includes the prescient voices of Kress and Bitzer, as well as the key contribution of Miller's work on genre. While the contributions of these semioticians may not be widely known outside their respective fields, any examination of the printed page must be interdisciplinary if we are to understand the true nature of its continuing impact. The current study's literature selection process is neither exhaustive nor representative; instead, it is intended to focus on "works that were highly original when they appeared and influenced the development of future efforts in the topic area" (Cooper & Hedges, 2009, p. 6).

The problem under consideration is our continued practice of defaulting to a page-centric document format (PDF) when a more accessible option preferred by users of assistive technologies (EPUB) is readily available. To aid in examination of that problem, the current research explicitly poses the following question: To what extent are social factors responsible for maintaining our valorization of PDF's page-centric viewport over reflowable text?

Literature Review

The distribution of documents in PDF format mimics the materiality of print by preserving its visual rhetoric. Such practices are not simply a matter of habit or convenience; they are an expression of power. One view of this transformation in our document exchange practices comes from Kress (2005), who wrote about the wrenching change incurred by the digital distribution of content in still-editable formats. He noted that such a practice facilitated, in ways that printed books did not offer, the opportunity for readers to become authors:

> I can change the text that comes to me on the screen. My means of disseminating my message are now much like those of other authors. That factor, of course, brings about a radical change to notions of authority: When everyone can be an author, authority is severely chal-

> lenged. The social frames that had supported the figure of the author have disappeared or are disappearing and with that the force of social power that vested authority in the work of the author. (p. 19)

Kress is referring to a loss of control suffered by both authors and publishers when editable native-format word processing files were the only option for electronic file distribution, a practice that endangered their elite status within print culture. The arrival of the PDF format caused this short-lived issue to abate, returning to authors and publishers nearly all the control to which they had been previously accustomed. Through Kress, we can understand that printed books have always been elitist artifacts; while the replacement of scribes with hand-set metal type may have allowed the mass production of books, it did little to alter an existing power structure in which the gatekeeping role of publishers created and supported the prestige claimed by authors. More than six hundred years after Gutenberg's type founding breakthrough, that equation came under direct threat when the desktop publishing revolution finally empowered average citizens to design, typeset, and then print their own publications, or to alter and repurpose documents produced by others.

The preferential status that for so long has been automatically awarded to ink-on-paper books and journals is more than a matter of routine. Kress explains that print's valorization is connected to "the long domination in the West of writing as the culturally most valued form of representation: and more, the long association of the mode of writing with the equally dominant, valued, and powerful medium, namely the book" (2005, p. 16). For academia, Kress confirmed that the book should be understood as a form of social action; it is a privileged artifact, implying "questions that point toward causality, agency, power." He forecast that pages would continue to last, as the traditionally represented word (whether in print or a digital facsimile) "inevitably has a power dimension: The elites will continue to use writing as their preferred mode, and hence, the page in its traditional form" (p. 18).

As society acclimates itself to the reflowable presentation of text and graphics on websites and phone apps that Kress failed to anticipate, why is the geometrically fixed PDF format still our default selection for sharing archivable documents? The tenets of genre theory can provide guidance in making this determination. Through the lens of genre, we can view PDF's success and resilience as a continuation of our printed past. By first establishing the traditional interdependencies of social discourse and the printed word through the lens of genre, we can trace the reassignment of those dependencies from print to PDF.

Bitzer (1968) first located genre at the intersection of situation and discourse: "From day to day, year to year, comparable situations occur, prompting comparable responses." He noted that genre, as a recurring form of rhetorical response, becomes valorized as a tradition that "tends to function as a constraint upon any new response in the form" (p. 13). This is evident in the way post-secondary instructors choose the PDF format when distributing some of academia's more prestigious genres, such as scholarly journals or book chapters. Once we are willing to see our preference for print-like representation as connected to the functions these printed documents

served, genre becomes a useful tool to probe the ongoing primacy of print-centric non-reflowable document formats.

Miller's (1984) definition of genre as a stable mode of response to a specific recurrent situation explains stylistic consistency as a response to typified rhetorical action. Miller expanded the scope of previous genre theory, which had focused solely on textual content, by illuminating the important role of visual rhetoric in the definition of a genre category. Miller built upon the earlier work of Bitzer when she explained the public (social) nature of these rhetorical responses, e.g., books, journals, and legal documents, as a form of social action. She noted that "as action, it acquires meaning from situation and from the social context in which that situation arose" (p. 163). These social factors reinforce print publishing's established practices, supporting Miller's statement that "genres serve as keys to understanding how to participate in the actions of a community" (p. 165). From this statement, we can better understand our default reliance on PDFs, which offer electronic transportability while maintaining the visual rhetoric of print.

Few empirical research studies have explored the potential for widespread EPUB adoption within academia. In a rare peer-reviewed study involving e-book formats, Mills (2016) conducted a quasi-experimental test of student preference between a course textbook distributed in one of three e-book formats: PDF, KF8 (Amazon Kindle documents), and EPUB. Some students received an EPUB document, while others received either a PDF file or a KF8 (Kindle) file. Participants who received the EPUB file reported significantly higher levels of interaction and engagement with the course text, as well as greater perceptions of the text's usefulness and value (p. 130). These findings support the current research's recommendation of EPUB as a format well suited for sighted readers as well as users of assistive technologies. More recently, Hinderliter (2021) examined altruism's role in technology adoption within the context of Universal Design for Learning (Rose et al., 2006), which recommends the use of texts that are compatible with assistive technologies. As calls for the use of highly accessible document formats in our classrooms leads educators to consider transitioning from PDF to the more accessible EPUB format, Hinderliter's research enumerated factors that motivate abled students to adopt this new technology. Through qualitative analyses of six participants' statements and actions while using EPUBs, four primary motivational factors were identified: compliance, ease of use, convenience, and altruism. While altruism proved to be the least motivational of these four factors, the university students who participated in the current study expressed their willingness to adopt EPUB technology for course readings, with their statements and observed abilities indicating that substantive resistance to adoption would be unlikely.

Discussion

For the texts we rely upon to fuel our students' epistemic journey, is the visual image a of the printed page truly necessary? If we desire that our sighted users should have access to the original physical document (or a digital facsimile), it is important to ask why this visual attribute is prized. Key to our understanding of preferred document formats within academia is recognition of the author's motivations, including citation. Lanham (1995) anticipated this concern decades ago, asking, "How will the electronic word affect the elaborate system of merit badges [citations] that, during the last hundred years, we have worked out on the basis of print? It is only when we compare print to its pixeled analogue that we realize how talismanic the physical book and journal have become. Will we feel as good about a text that exists only in electronic form, or as cheap printouts?" (p. 20). As Lanham presaged, our library databases largely preserve the "talismanic" appearance of printed books and journals through the use of PDFs. By mimicking the appearance of traditional print formats, PDF's dominance indicates that the academy's "system of merit badges" prioritizes the avoidance of disruption to this established axiology by closely mimicking the practices of the past.

Print design's visual rhetoric, as embodied by academic books and journals and emulated by PDF, serves as a reminder of elite status and the imbalance of power between publisher/author and reader. Kress (2005) noted that "convention is the result of social power over time, expressed in the form of laws and rules" (p. 16), and that "representation and communication are motivated by the social; its effects are outcomes of the economic and the political" (p. 6). As one example, if we see students' desire for better smartphone reading experiences as a need for specific types of (reflowable) representation and (accessible) communication, we can anticipate dissatisfaction if the only mode of interaction we offer fails to address that objective. Until the user's experience is given full consideration, the digital reading experience remains an exercise in power and domination.

In an age when most course readings are likely to be viewed on the screens of computers, tablets, and smartphones, PDF's ability to mimic print has been key to a seamless transition between the printed page and electronic displays. Multiple studies indicate that the two practices, i.e., the traditionally crafted print vehicle and its digital doppelganger, are equivalent in terms of student comprehension (Margolin et al., 2013) and achievement (Sheppard et al., 2008; Woody et al., 2010). In essence, since before the advent of accessibility concerns, the choice of media, i.e., print or PDF, has been of diminished importance since both offer essentially the same visual appearance. PDF's ability to faithfully maintain the appearance of print affords the extension of print's prestige onto the digital form because their similar visual representations allow us to identify them as being of the same genre. In this way, PDF maintains the traditional benefits of print authorship for the creators of digitally distributed documents, a benefit that also extends to the publisher. As long as the established cultural affordances of print remain associated with the new media selection, users who are well-equipped to experience those texts digitally can enjoy

a substantially consistent experience while publishers and authors maintain their traditional practices and privileges. However, this status quo fails to adequately address the needs of assistive technology users, restricting their potential for full and equal participation in the learning process.

Conclusion

By interrogating our current document distribution practices in the light of both genre and accessibility, the current research has sought to illuminate the tension between academia's reliance on PDF and our desire to be more inclusive. Having asked why we default to this page-centric document format when a more accessible option is preferred by users of assistive technologies, these findings indicate that our largely unexamined adoption of PDF stems from its ability to maintain our normalized value system by emulating our printed past. We rely on PDF distribution to support long-standing sociopolitical relationships that benefit authorship and publication, while ignoring the evidence that "accessible PDFs" are an inadequate response to the challenges faced by an ever-growing number of assistive technology users.

Once we recognize that many of print's affordances are seamlessly transferred to page-centric PDFs, is there any hope for a more inclusive vision of electronic texts? Miller's (1984) theory explains that yes, reflowable e-books can also become a popular genre if the appropriate exigency arises. Despite the capital investments already made in our PDF archives, a change in focus from *production efficiency* to *better learner experiences* may be all that is needed to cause a transformation in society's response. Miller noted that, "Recurrence is an intersubjective phenomenon, a social occurrence, and cannot be understood on materialist terms" (p. 156). As such, when the need for accessible electronic books becomes "an objectified social need" (p. 157), the corresponding genre will arise as a "stylistic and substantive response to perceived situational demands" (p. 153). As Baby Boomers become users of assistive technologies, paying PDF's price to retain print's social status may be harder to justify; certainly, users of all ages already question why PDFs must be so difficult to read on their smartphones.

There may be no stronger exigency than the potential for liability, but must we wait for lawsuits to force a change in our current practices? As educators, it is our moral responsibility to be critical of our own practices so that we might locate and resolve the inequities therein. Stalling any action until visually impaired students enroll in our classes is an inadequate reaction, as it burdens those first participants with additional hurdles that perpetuate the existing segregation of students with disabilities. Students are told they must first declare their disability and seek documentation of their infirmities before accessible texts can be provided; this is the inverse of universal design (Mace, 1988, p. 3), which mandates that all students receive fully accessible texts as default operating procedure. Instead, the current research urges educators to follow the lead of affected communities who have

already expressed their clear preference for EPUBs when it comes to the personal archiving and offline use of digital documents.

The limitations of this study include my difficulty in maintaining impartiality. After years of advocating for the use of PDFs within the publishing industry, I now view the PDF format as an overly complex and insufficiently accessible response to the need for universal student access. Additionally, instructing online courses has made apparent the difficulties many students face when using smartphones to access class readings.

Recommendations for future research include the investigation of other alternative formats for the books, journals, and readings disseminated within academia. Additionally, the voices of assistive technology users should be brought to the forefront in subsequent research, and such studies should be stratified to appraise the preferences of and benefits to a diverse range of user groups.

References

Alliance for the Equality of Blind Canadians. (2017). *Moving towards an accessible Canada*. https://3390d3ac-ceb8-4809-a018-cfc22eb903b3.filesusr.com/ugd/757284_5539075b6b254467b28e1dcceaff4479.docx?dn=2017-Accessible%20Canada%20Consultation%20-%20AEBC.docx

Australian Human Rights and Equal Opportunity Commission. (2014). *World Wide Web access: Disability Discrimination Act advisory notes ver 4.1*. https://humanrights.gov.au/our-work/disability-rights/world-wide-web-access-disability-discriminationact-advisory-notes-ver#s2_3

Bitzer, L. (1968). The rhetorical situation. *Philosophy and Rhetoric, I*(1), 1–14.

Briggs, J. (2016, May 5). *Real users on Adobe PDFs*. Simply Accessible. http://simplyaccessible.com/article/real-users-pdfs/

Cooper, H., & Hedges, L. V. (2009). Research synthesis as a scientific process. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (pp. 3–16). Russell Sage Foundation.

DAISY Consortium. (2011, May 23). *EPUB 3 proposed specification now released*. http://www.daisy.org/files/news/attachments/epub_3_proposed_specification_press_release_may_23rd_2011.html

Hinderliter, H. (2021). The role of altruism in EPUB technology adoption for higher education. *Visual Communication Journal, 58*(1), 1–13.

Johnson, D. (2014, August 21). *3 key tips for beating Acrobat's z-order nightmare*. Duff Johnson Strategy & Communications. Retrieved from http://duff-johnson.com/2014/08/21/3-key-tips-for-beating-acrobats-z-order-nightmare/

Kerscher, G. (2015, April 7). *Baseline for born accessible EPUB: A practical consensus approach by the inclusive publishing industry*. DAISY Consortium. http://accessiblepublishing.org/baseline-for-born-accessible-epub/

Kranzberg, M. (1986, July). Technology and history: "Kranzberg's laws". *Technology and Culture, 27*(3), 544–560.

Kress, G. (2005). Gains and losses: New forms of texts, knowledge, and learning. *Computers and Composition, 22*(1), 5–22.

Lanham, R. (1995). *The electronic word: Democracy, technology, and the arts*. The University of Chicago Press.

Mace, R. (1988). *Universal design: Housing for the lifespan of all people*. USGPO.

Margolin, S. J., Driscoll, C., Tolen, M. J., & Kegler, J. L. (2013). E-readers, computer screens, or paper: Does reading comprehension change across media platforms? *Applied Cognitive Psychology, 27*, 512–519.

Miller, C. (1984). Genre as social action. *Quarterly Journal of Speech, 70*, 151–167.

Mills, M. (2016). Student preference of a customized, open-access multi-touch digital textbook in a graduate education course. *Contemporary Educational Technology, 7*(2), 123–137.

Narup, T. (2013, October 24). At Elsevier, making books accessible for students. In R. Orme (Ed.), *Technology brings new era for readers with disabilities*. https://www.elsevier.com/connect/technology-brings-new-era-for-readers-with-disabilities

Penn State. (n.d.). PDF issues & recommendations. *Accessibility and Usability at Penn State*. http://accessibility.psu.edu/pdf/pdfissues/

Rose, D., et al. (2006). Universal design for learning in postsecondary education: Reflections on principles and their application. *Journal of Postsecondary Education and Disability, 19*(2), 135–151.

Seaman, R. (2011). *Candidate statement – Robin Seaman*. International Digital Publishing Forum. http://idpf.org/board-elections-2011-11/candidate-statements/seaman

Sheppard, J., Grace, J., & Koch, E. (2008). Evaluating the electronic textbook: Is it time to dispense with the paper text? *Teaching of Psychology, 35*, 2–5.

Woody, W., Daniel, D., & Baker, C. (2010). E-books or textbooks: Students prefer textbooks. *Computers & Education, 55*, 945–948.

Supporting Teachers in Designing for Intersectionality

Melissa Warr and Wendy Wakefield

As educational researchers and instructional designers, we often attempt to create standardized solutions designed to work in all learning contexts. However, sometimes this approach ignores the intersectionality of students' identities, or how their culture, language, abilities, economic background, gender, and other sociocultural factors interact to foster privilege, oppression, and inequalities (Crenshaw, 1989) and affect their learning experiences in and out of school. Philip et al. (2019) asserted that teaching must be "relational and situated. It is not only a technical endeavor but also an intellectual and creative one" (p. 259). An over reliance on the technical or "best" practices "has a long history of ultimately harming historically marginalized communities" (p. 257). In this chapter, we draw upon the concepts of figural complexity, particularity, and design to argue for the need to frame and educate teachers as designers. Through design-centered practice, teachers can create learning opportunities centered around the particular and complex intersectional identities of the learners in their classroom. We focus primarily on K-12 teachers, but similar arguments could be made for teachers in other contexts.

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Intersectionality, Figural Complexity, and the Particular

Our argument centers on the idea of teachers as designers—that framing teachers as designers places an emphasis on creating learning opportunities centered on students and context. This is because design is deeply embedded in context: While a scientific approach attempts to create knowing that applies across contexts, design focuses on knowing and creating that is adapted to a specific (particular) context amidst complexity (see Nelson & Stolterman, 2012; Perkins, 1986). From this design perspective, teachers design opportunities for learning. Like all designers, they can develop ways of working and knowing that are embedded in the specific context of their classroom and students–the particular (Warr & Mishra, 2021; see also Nelson & Stolterman, 2012). The classroom context is fluid and complex. Intersecting aspects of each student's and teacher's sociocultural identities, curriculum, societal expectations, and political context are in constant flux (Harris & Leonardo, 2018). The complexity is akin to Donald Schön's (1990) construct of *figural complexity*, a term describing the interdependent relationships of parts of a whole. Schön described design as a way to work with figural complexity, which we will explore in more depth below. First, however, we address what we mean by intersectionality and its relationship to educational equity.

Intersectionality

Intersectionality examines how groups are multiply marginalized when issues of inequity and oppression are considered from only a single sociocultural factor, such as race or gender, rather than the intersection of these and other factors (Crenshaw, 1991). According to Hill Collins and Bilge (2016), "Intersectionality is a way of understanding and analyzing the complexity in the world, in people, and in human experiences" (p. 2). In education, an intersectional lens focuses on the multiple, interacting sociocultural factors and social structures that shape students' educational experiences (Tefera et al., 2018). These intersecting factors can facilitate or hinder students' learning opportunities in a variety of ways, depending on what is privileged within a specific educational context or system (Boveda & Weinberg, 2020).

A common misconception in education is that effective teaching practices and materials transcend culture and are the same for all students in all settings and circumstances (Gay, 2018). In the United States, middle-class European American cultural values and norms are so deeply embedded in education that they have become largely invisible and unchallenged as the "best" way to teach students (Souto-Manning & Rabadi-Raol, 2018). Yet groups of marginalized and multiply marginalized students (e.g., students of color with disabilities) continue to experience barriers and inequities within this educational system (Artiles, 2013).

In general, centralizing the intersectional identities of students in order to increase educational equity includes recognizing "troubling restrictive notions of

what counts as legitimate knowledge in schools and schooling and unveiling multiple interconnected injustices in and through pedagogies" (Souto-Manning & Rabadi-Raol, 2018, p. 214). Teachers are situated within specific educational contexts, work directly with students, and, ideally, build relationships with these students. Thus, teachers are uniquely positioned to design equitable learning opportunities if they have the support and knowledge to do so.

Figural Complexity

Intersectionality is a way of understanding how multiple sociocultural categories shape students' identities and their experiences in school (Hill Collins & Bilge, 2016; Tefera et al., 2018). These categories are not simply independent or additive, they are interdependent and multiplicative, especially in relation to dynamics of power and inequality. As Crenshaw explained, "We tend to talk about race inequality as separate from inequality based on gender, class, sexuality, or immigrant status. What's often missing is how some people are subject to all of these, and the experience is not just the sum of its parts" (as cited in Steinmetz, 2020, para. 2) For example, the experiences of a student of color with a disability cannot simply be considered as the sum of the experiences of students of color and students with a disability (Artiles, 2013). The intersection of these aspects of the student's identity shapes a different experience altogether. Donald Schön's figural complexity presents a similar construct (Schön, 1990).

Figural complexity describes the interdependent relationship of multiple parts of a whole. Schön (1990) gives the examples of how changing a single note in a melody changes the whole melody, or how changing a color in a painting will affect the rest of the painting. In this case, we might consider two levels of figural complexity: the individual student and the students in a group (such as a class). First, a focus on intersectionality emphasizes the interactive and interdependent relationship of various identities of an individual which is unique and cannot be duplicated. Student groups can also form an interdependent whole. Each student affects the other students in the class. The teacher and their intersectionality also interact in the context.

Importantly, figural complexity assumes that the elements of a whole will change; it goes beyond "the stable state" (Schön, 1971) to represent a dynamic situation. Similarly, intersectional identities are not fixed, and the privilege and inequities related to these identities shift and change frequently in response to social, economic, and political conditions (Harris & Leonardo, 2018). Thus, not only do the students and teachers in a classroom change, external events also constantly shift. An obvious example is the changes resulting from the COVID-19 pandemic; however, even smaller shifts, such as technological, cultural, and political trends, upset the stability of the classroom.

The Ultimate Particular

A circumstance that demonstrates figural complexity—be it an intersectional identity, class, lesson, or other entity—is unique. The complexity means that even the same student, class, or lesson will be different each moment in time. The result is particularity—or what Nelson and Stolterman (2012) called the "ultimate particular" (p. 12).

Nelson and Stolterman (2012) contrasted the "true and ideal" with the "ultimate particular and real" (p. 31). They described the true as facts and the ideal as desiderata (what is desired). The true and ideal might be compared to scientific knowledge, where one creates a theory that is true across contexts. A similar mindset underlies standardized curricular and pedagogical approaches. On the other hand, the ultimate particular and real describes something (e.g., an object, process) that exists in a unique form in a concrete way. Design is "a process of moving from the universal, general, and particular to the ultimate particular—the specific design" (2012, p. 31). In a classroom, the ultimate particular might be the interaction of factors such as the intersectional identities of students and teachers, sociocultural context, and curriculum at a moment in time.

The ultimate particular is congruent with Schön's definition of figural complexity; it is a dynamic situation that cannot be predicted. Our exploration of intersectionality has highlighted a similar type of complexity and particularity. How, then, might a teacher support learning in such a context? How can teachers manage the complex particular, centering students' intersectional identities, instead of generalizing and standardizing, perpetuating dominant approaches that privilege some over others? Schön, Nelson, and Stolterman offered a way of acting, knowing, and being that capitalizes on complexity and uniqueness: design (Nelson & Stolterman, 2012; Schön, 1983). This is because design thrives in complex and particular situations (Redström, 2017). In the next section, we dig deeper into what design means for centering student intersectionality in the figurally complex, ultimate particular and how framing teachers as designers might support more equitable classrooms.

Teachers as Designers

If, as we assert, framing teachers as designers can better center student intersectionality in the classroom, what do we mean by design? Design is a widely used term with many definitions, but we agree with Redström (2017) that "the presence of many *different* definitions of design is not a conceptual shortcoming of our thinking but in fact an effective strategy for coping with certain kinds of complexity" (p. 6; see also Lawson & Dorst, 2009). In respect for this complexity, we do not offer a singular definition of design here. Rather, we describe how teachers can be framed as designers from four perspectives (design as planning, acting, learning, and knowing) and the relationship of each perspective to intersectionality, figural complexity, and particularity.

Design as Planning

"Planning" is a phrase often used to describe what teachers do before class time. Although many would not consider planning as an act of design, teachers who center the intersectionality of their students' identities must combine, modify, and adapt resources to meet students' particular needs, and such an act requires more than simply scheduling when to read a textbook chapter or selecting a homework page from a textbook. In this section, we discuss two dimensions of design as planning: *what* is designed and how teachers use curricular materials and technologies in their designs.

First, *what* do teachers design before class time? Although teachers might design activities, projects, assessments, and other tangible artifacts, ultimately, they create and combine several aspects of the classroom, including tasks, physical architecture, and the social architecture that will support learning (Goodyear & Dimitriadis, 2013). Scholars have labeled this "design for learning" (see Conole, 2013; Goodyear, 2015; Goodyear & Dimitriadis, 2013). The "for" suggests that while teachers can create environments and structures that support learning, they cannot directly design the learning; ultimately students must choose to engage in learning opportunities and construct their own understandings (Goodyear & Dimitriadis, 2013). What teachers design are the combination of tasks, social structures, and the physical environment that they believe will support students' learning. They are designing opportunities for learning.

Second, how do teachers use materials and technologies when they design opportunities for learning? We can describe teachers' use of curricular materials and technologies on a scale of teacher agency (Brown, 2011). Teachers can select to "offload" agency to the materials (following them closely), work more flexibly with the materials to adapt them to their students' needs, or engage in free improvisation. Teachers make changes to align with their own knowledge and goals, their students' needs and strengths, beliefs about the subject matter, and beliefs about technology (Davis et al., 2011; Matuk et al., 2015). Importantly, teachers work with materials and technologies; they change materials to fit their context and the affordances of the tools affect how teachers teach (Brown, 2011). This means that others, such as instructional designers, who create tools and curricular materials impact teachers' abilities to meet the needs of their classes and provide equitable learning opportunities.

When planning, teachers design for intersectionality by reflecting on the students in their classroom. They center intersectionality as they select and adapt the materials as well as physical and social environment for learning. Ultimately, however, it is impossible for a teacher to anticipate what will occur in their particular figurally complex classroom at any given time, and any design planned before class time will require adjustment. This leads to our second view of design: design centers action in the ultimate particular.

Design as Acting

Design can be considered as acting in two ways. First, a design process requires action that helps the designer create in and understand a situation. Second, some describe improvisational acts, such as a teacher responding to the immediate needs of students during a learning episode, as an act of design (Brown, 2011). Both perspectives describe a way of handling figural complexity and the resulting particularity. Both can help teachers center the intersectionality of their students, creating more equitable learning spaces. Here we explore both angles through Schön's (1983, 1987, 1992) concept of reflection-in-action.

Because a design situation is unique and often volatile (particular and figurally complex), designers cannot fully comprehend—or plan for—a situation. Instead, they work in a way that does not require complete understanding: They interact with the situation to simultaneously come to understand and create. Schön (1983) described this way of acting as "reflection-in-action," where "the unique and uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it" (p. 132).

Schön (1992) compared reflection-in-action to having a "conversation with the situation" (p. 134). In a productive conversation, conversers do not ask questions because they know what the other will say. Rather, they speak to learn from and develop knowing with their interlocutors. Similarly, in a conversation with the situation, the designer does not act because they know what will happen; rather, they act to find out what will happen—how the situation will respond. This way of working is effective even amidst complexity and rapidly changing situations—the designer continues to respond to the situation as it exists in the particular moment; they change with the situation. Although they draw upon past understandings to inform their actions, they respond to what is, not what was in the past.

Although reflection-in-action is often used to describe improvisatory acts, including teachers' ongoing adjustments in the classroom, Schön (1983) applied the term to design on multiple scales. Engaging in reflection-in-action means interacting with a situation "in the 'action-present,' the zone of time in which action can still make a difference to the situation. The action present may stretch over minutes, hours, days, or even weeks or months" (p. 62). Thus, reflection-in-action can be applied to both the immediate changes teachers make in situ as well as how they act and learn across longer periods of time, such as a school year. This way of acting is at the heart of design.

A designerly way of working, where the designer can continually learn and adapt to the complexities of the particular, offers a framework for how teachers can meet the needs of their students—individually and as a group. This approach does not require teachers to do the impossible task of fully understanding the intersectionality of each student (though some basic knowledge about the students can be extremely helpful). Rather, teachers constantly learn through acting in the particular.

Design as Learning

Design as acting supports the next perspective on design: design as learning. Adaptation supports teachers in learning; Each adaptation offers an opportunity for learning more about the student and context. Even if teachers cannot articulate new understandings, they still can move what they learn forward into new designs.

Design is a type of learning in that it consists of seeing a situation in multiple ways, evaluating the situation from various perspectives, and using what is discovered to adapt (Lawson & Dorst, 2009; Schön, 1983). The result is "learning cycles" that allow you to "explore different possibilities and learn your way towards a design solution" (Lawson & Dorst, 2009, p. 34).

Schön (1990) described that the learning that occurs through design supports an "appreciation of figural complexity" (p. 125). As teachers engage in design—both before and during class time—the ongoing reflection helps them learn about their students, class, and practice. This is not to say that teachers necessarily can articulate the details of what is learned. Rather, what is learned becomes part of their "*representation* of a design situation" (Schön, 1990, p. 123)—the design situation being the learning or development of students in their classroom.

By viewing teaching as design, we open the space for teachers to learn while responding to the intersectional identities of their students. Rather than offering a standardized curriculum that supposedly meets the needs of all, it recognizes that teachers are in the best position to learn about and address the needs of *their* students in *their* classroom. Design practice results in a type of knowing that is developed *through* the complex particularities of the teacher's classroom, which we explore next.

Design as Knowing

The learning that occurs through design leads to a type of fluid and complex knowing that reflects the teacher's contexts and experiences. We will draw on two scholars to describe what designing for intersectionality means for teacher knowing. First, we explore David Perkin's description of a design as a "structure adapted to a purpose" (1986, p. 2). Second, we compare this to Glanville's (2006) descriptions of the difference between "knowledge of" and "knowledge for."

Perkins (1986) defined the noun form of design as a "structure adapted to a purpose." He proposed knowledge itself could be thought of as a design. Like any designed entity, knowledge is "devised to serve [a] purpose," (p. 2) whether that knowledge is a formal theory or informal understanding of the world. As a type of design, knowledge is formed through cycles of seeing as, evaluating the results, and adjusting understanding accordingly. This results in teachers developing knowledge that is "adapted to [the] purpose" (p. 2) of teaching their particular students in their particular classroom context.

The idea of knowing built to meet a purpose aligns with what Glanville (2006) described as "knowledge for." He contrasted "knowledge of," where teachers might know something of or about their students, with "knowledge for," or knowing in a way that is needed to support students' learning. "Knowledge for" does not assume teachers have a complete understanding of their students or context. Rather, they develop the knowing they need to act in the context and support their students. Because that knowing is designed, it is fluid and adaptable, constantly responding to changes. It is knowledge for the figurally complex, ultimate particular of their students in their classroom.

Implications

In this chapter, we have argued for the importance of centering intersectionality in teaching, the figural complexity and particularity of both intersectional identities and today's classrooms, and how a design approach has the potential to support teachers in meeting student needs amidst this complexity. This perspective has broad implications for educational systems, teacher education, teacher practice, and instructional design. Here we focus on two implications specific to the creation of learning materials: teachers and the origin of instructional materials, and the need for instructional designers to create flexible materials.

Teachers: Origins of Instructional Materials

We have argued that teachers should design opportunities for learning for the particular students in their classroom. We mentioned opportunities for learning might consist of tasks, physical architecture, and the social architecture of the classroom (Goodyear & Dimitriadis, 2013). Curricular materials often come with embedded assumptions about these dimensions that privilege certain students' ways of learning and knowing and using these materials without adaptation can contribute to inequitable learning environments (Souto-Manning & Rabadi-Raol, 2018). How teachers use—or create—instructional materials as they design for learning becomes critical to equity in education.

Consider two extremes of the relationship between teachers and instructional materials. First, teachers might only use existing materials that were designed for learners in a different context, unaware of the biases present in the materials. Second, teachers might develop all of their own materials from scratch to specifically meet the needs of their students. However, doing so might be unreasonably time intensive and fail to draw upon the shared knowledge researchers have built around instruction. We propose teachers find a balance between these two extremes, critically analyzing prepared instructional materials before use as well as creating instruction specific to their students. This is not a small task; it requires new

approaches to teacher education as well as changes to the educational system. For example, teachers must critically analyze curriculum and adapt it to their students, designing new materials where necessary. This requires not only unique skills and ample preparation time, but also the agency to make appropriate changes.

Note, this approach does not mean teachers should ignore scientific understandings of how people learn, such as well-established learning theories. Rather, teachers can develop their own knowing through interactions in their context as well as critically evaluate scientific knowing as it specifically addresses the needs and intersectionality of students in their classroom. In other words, teachers can utilize scientific knowing to *support* their design work rather than attempting to adapt scientific knowledge to their designs.

Through the process of critically evaluating, mixing, and/or redesigning instructional materials, teachers develop knowing that is centered on their own teaching practice in their particular context. Teachers who engage in curricular design tasks take ownership of the curriculum; connect knowledge, skills, learning, and practice; and develop new pedagogical approaches and beliefs (Agyei & Voogt, 2012; Voogt et al., 2015). We argue that this approach also has the potential to help teachers center intersectionality, learning about and better meeting the needs of their students by considering the multiple ways in which students may be experiencing opportunities or barriers based on what is being privileged in the classroom.

Instructional Designers: Creating Multiple Pathways

This perspective on teachers, design, and intersectionality also has implications for those who design instructional materials for teachers or other learning contexts. Although we believe it is impossible to remove all bias from instructional materials, instructional designers can strive to be aware of how certain norms and values are embodied in the materials they create and how the designs impact the users.

When teachers choose to use prepared materials for their classroom, they are off loading some of their design agency to those materials (Brown, 2011). The materials might be designed in a way that supports adaptation and customization. Brown suggested curricular materials and tools include multiple points of access, focus on resources rather than steps or procedures, and support customization. For example, rather than creating one set of materials that could later be "adapted" to various students, instructional materials might include several pathways that would draw on the strengths of various students. Other material might describe multiple pedagogical approaches to address the same topic. Importantly, no single example or approach should be positioned as the primary or default method; instructional materials should include affordances that encourage teachers to make choices based on their students.

Conclusion

A focus on standardizing content and approaches within education has resulted in attempts to create materials or interventions that should be implemented with "fidelity" so that the outcomes meet the standardized expectations. This approach unavoidably values certain ways of learning and knowing above others, resulting in unequal learning opportunities for many students.

By framing and educating teachers as designers, teachers can be empowered to create learning opportunities that recognize the complex and particular intersectionalities of their students. Instructional designers can support this work by creating materials that encourage teachers to make choices based on the unique intersectional identities and needs of their students. We believe this lens offers a useful way to consider and begin to address the implicit bias and inequities in curricular materials.

References

Agyei, D. D., & Voogt, J. (2012). Developing technological pedagogical content knowledge in pre-service mathematics teachers through collaborative design. *Australasian Journal of Educational Technology, 28*(4), 547–564. https://doi.org/10.14742/ajet.827

Artiles, A. J. (2013). Untangling the racialization of disabilities: An intersectionality critique across disability models. *Du Bois Review: Social Science Research on Race, 10*(2), 329–347. https://doi.org/10.1017/S1742058X13000271

Boveda, M., & Weinberg, A. E. (2020). Facilitating intersectionally conscious collaborations in physics education. *Physics Teacher, 58*(7), 480–483. https://doi.org/10.1119/10.0002066

Brown, M. W. (2011). The teacher–tool relationship: Theorizing the design and use of curriculum materials. In J. T. Remillard, B. A. Herbel-Eisenmann, & G. M. Lloyd (Eds.), *Mathematics teachers at work* (pp. 17–36). Routledge. https://doi.org/10.4324/9780203884645

Conole, G. (2013). *Designing for learning in an open world*. Springer. https://doi.org/10.1007/978-1-4419-8517-0

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *The University of Chicago Legal Forum, 189*, 139–167. http://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review, 43*(6), 1241–1300. http://www.jstor.org/stable/1229039

Davis, E. A., Beyer, C., Forbes, C. T., & Stevens, S. (2011). Understanding pedagogical design capacity through teachers' narratives. *Teaching and Teacher Education, 27*(4), 797–810. https://doi.org/10.1016/j.tate.2011.01.005

Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice*. Teachers College Press.

Glanville, R. (2006). Construction and design. *Constructivist Foundations, 1*(3), 103–110. http://www.asc-cybernetics.org/systems_papers/construction%20and%20design.pdf

Goodyear, P. (2015). Teaching as design. *HERDSA Review of Higher Education, 2*, 27–50.

Goodyear, P., & Dimitriadis, Y. (2013). In medias res: Reframing design for learning. *Research in Learning Technology, 21*(0). https://doi.org/10.3402/rlt.v21i0.19909

Harris, A., & Leonardo, Z. (2018). Intersectionality, race-gender subordination, and education. *Review of Research in Education, 42*(1), 1–27. https://doi.org/10.3102/0091732X18759071

Hill Collins, P., & Bilge, S. (2016). *Intersectionality*. Polity Press. https://www.worldcat.org/title/intersectionality/oclc/923665818

Lawson, B., & Dorst, K. (2009). *Design expertise*. Elsevier Ltd.

Matuk, C. F., Linn, M. C., & Eylon, B.-S. (2015). Technology to support teachers using evidence from student work to customize technology-enhanced inquiry units. *Instructional Science, 43*(2), 229–257. https://doi.org/10.1007/s11251-014-9338-1

Nelson, H. G., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world – Foundations and fundamentals of design competence*. MIT Press.

Perkins, D. N. (1986). *Knowledge as design*. Lawrence Erlbaum Associates, Inc.

Philip, T. M., Souto-Manning, M., Anderson, L., Horn, I., Carter Andrews, D. J., Stillman, J., & Varghese, M. (2019). Making justice peripheral by constructing practice as "core": How the increasing prominence of core practices challenges teacher education. *Journal of Teacher Education, 70*(3), 251–264. https://doi.org/10.1177/0022487118798324

Redström, J. (2017). *Making design theory*. MIT Press.

Schön, D. A. (1971). *Beyond the stable state: Public and private learning in a changing society*. Random House.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books, Inc.

Schön, D. A. (1987). *Educating the reflective practitioner*. Jossey-Bass, Publishers Inc.

Schön, D. A. (1990). The design process. In V. A. Howard (Ed.), *Varieties of thinking: Essays from Harvard's Philosophy of Education Research Center* (pp. 110–141). Routledge.

Schön, D. A. (1992). The theory of inquiry: Dewey's legacy to education. *Curriculum Inquiry, 22*(2), 119–139. https://doi.org/10.2307/1180029

Souto-Manning, M., & Rabadi-Raol, A. (2018). (Re)centering quality in early childhood education: Toward intersectional justice for minoritized children. *Review of Research in Education, 42*(1), 203–225. https://doi.org/10.3102/0091732x18759550

Steinmetz, K. (2020). She coined the term "intersectionality" over 30 years ago. Here's what it means to her today. *Time Magazine*, *23*.

Tefera, A. A., Powers, J. M., & Fischman, G. E. (2018). Intersectionality in education: A conceptual aspiration and research imperative. *Review of Research in Education, 42*(1), vii–xvii. https://doi.org/10.3102/0091732X18768504

Voogt, J., Laferrière, T., Breuleux, A., Itow, R. C., Hickey, D. T., & McKenney, S. (2015). Collaborative design as a form of professional development. *Instructional Science, 43*(2), 259–282. https://doi.org/10.1007/s11251-014-9340-7

Warr, M., & Mishra, P. (2021). Integrating the discourse on teachers and design: An analysis of ten years of scholarship. *Journal of Teaching and Teacher Education, 99*(March 2021). https://doi.org/10.1016/j.tate.2020.103274

The Effects of COVID-19 on Student Achievement Gap: A Literature Review

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This chapter reviews literature that discusses the impact of social inequality and COVID-19 on the student *achievement gap*, which refers to the discrepancy in educational performance, observed in "grades, standardized-test scores, course selection, dropout rates, and college-completion rates, among other success measures" (Ansell, 2011, para. 1). The information is particularly beneficial for instructional designers, educators, and related service providers who support K-12 students from culturally and linguistically diverse backgrounds. Prior to the pandemic, online learning programs existed at primary, secondary, and tertiary education levels in the United States. Students made progress with online learning because it was intentionally designed to be taught online, incorporated accessibility in its design, and teachers were trained to deliver the instruction (Converse Willkomm, 2020). However, COVID-19 gave rise to emergency remote learning when schools abruptly closed. Remote learning occurs when classes intended to be taught in a face-to-face setting are held online; however, instructional resources (e.g., required textbooks) may not be fully available online (Converse Willkomm, 2020). Thus, students lose adequate access to course content necessary for academic success.

For the purpose of this discourse, we defined *social inequality* as disparities in access to substantive learning materials, digital tools, and the internet as a result of a lack of financial and/or technical ability to meet this need (The Education Partnership, 2020). The *digital divide* refers to disparities that negatively impact cohesivity and hinder the political efficacy of specific groups within a population

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(Organisation for Economic Co-operation and Development, 2001). Since research has shown that students' socioeconomic backgrounds often influence their access to instruction (Dorn et al., 2020), we conducted this literature review to determine how the gap widened due to COVID-19 and discuss potential solutions to address the unfolding situation.

Methodology

Since the pandemic is still ongoing and its long-term effects have yet to be determined, we found few empirical research studies. We searched major databases, such as ERIC, EBSCO, and Google Scholar using the search terms "digital divide, COVID-19, K-12, achievement gap, social inequality" to find the most relevant publications. Given the nature of the subject, the literature review was limited to published studies and media publications between 2020 and 2021 that focused on K-12 settings. States differed considerably in their responses to the pandemic (Kettl, 2020). Therefore, we limited the studies to the United States because of the variability within the country. Adding data from different countries would necessitate grappling with even more confounding variables and nuances that only apply to certain localities.

All 14 studies were conducted in English. All the sources concluded that the student achievement gap widened for students from disadvantaged backgrounds following the move to remote learning. The main data collection methods used in these studies were surveys, interviews, and review of artifacts. We analyzed the literature to determine how the achievement gap widened during COVID-19 to highlight areas of future research, and to make recommendations for school systems in the United States.

Pre-COVID-19

Across the globe, nearly half a billion learners unexpectedly transitioned to virtual learning, where family members were forced to assume new roles as facilitators and pseudo-teachers (Cohen & Kupferschmidt, 2020; Garbe et al., 2020). In the United States, nearly 55.1 million students in 124,000 public and private schools experienced such closure at its peak, starting from early March 2020 (Education Week, 2020). This is particularly important because research has shown that students from disadvantaged backgrounds are at higher risk for regression during breaks from school than their more privileged peers (Dorn et al., 2020). Regression is higher in those students because their parents are less likely to afford summer learning programs due to high costs and/or unavailability of educational opportunities.

Before the pandemic, research showed differences in achievement between students of color and their white counterparts (Yeh, 2016). Some attributed these

discrepancies to factors that influence students' environments before beginning school (i.e., parenting behaviors, aspects of the family environment, etc.) (Yeh, 2016). Yet, other researchers associated the persistent nature of these gaps throughout the K-12 timespan with factors related to the school environment (Yeh, 2016). Two aspects of the conventional school environment that have been associated with decreasing student engagement and exacerbating achievement gaps are the inability to provide consistent, personalized, and objective feedback, and the inability to offer difficult tasks specific to students' competency levels (Yeh, 2016). The Universal Design for Learning framework has established that the design of the learning environment influences the performance of all students (Center for Applied Special Technology, 2020).

The decision to close schools during the COVID-19 pandemic was inspired by previous closures during influenza outbreaks, including the Swine Flu and MRSA (Cowling et al., 2020; Nafisah et al., 2018). But, the prolonged nature of school closures during COVID-19 was unprecedented, and as such, altered the lives of students and their families (Garbe et al., 2020). Families were unprepared for this unparalleled phenomenon and had to adjust their lives to accommodate their children's learning needs (Garbe et al., 2020). Some of the adjustments resulted in job loss and an increase in stress levels related to adjusting to the new normal (Garbe et al., 2020).

This literature review found evidence of exacerbating social inequalities and achievement gaps in distinctive categories caused by COVID-19.

Discussion

Lack of Access to Devices

Nine of the articles we reviewed discussed how lack of access to devices (i.e., laptops, desktops, tablets, etc.) impacted students during the pandemic. A study by Basham et al. (2020) reported that many students, such as those living in multifamily units in rural and urban areas, had insufficient access to devices during the COVID-19 school closures. Some may have had to share computers with siblings. Parents from low-income backgrounds often had to share their devices with their children while working from home (Jackson, 2021). Many parents were also forced to purchase new equipment to accommodate the growing needs, thereby inflating their financial burden (Jackson, 2021). Some students had devices that did not fit their learning needs (Jackson, 2021).

The Pew Research Center conducted a survey in April 2020 that provided further confirmation that lack of access to devices negatively impacted students' progress in the curriculum during online learning. The survey found that one in five parents with homebound school children said it was very or somewhat likely that their children would not be able to complete their schoolwork because they did not have

access to a computer at home (Pew Research Center, 2020). Approximately 30% of parents also reported it was at least somewhat likely that their children would have to do their schoolwork on a cellphone (Pew Research Center, 2020). These adverse effects on virtual learning were exacerbated for parents with lower incomes. The survey further indicated that some 43% of low-income parents said it was very or somewhat likely that their children would have to do schoolwork on their cellphones (Pew Research Center, 2020). About one-third (36%) of parents said it was at least or somewhat likely that their children would not be able to complete schoolwork because they did not have access to a computer at home (Pew Research Center, 2020). Hence, the lack of access to appropriate devices would likely impede active learning.

Several studies have shown the effectiveness of active learning (Prince, 2004; Settles, 2012) and active participation (Pratton & Hales, 1986) in including students in the learning process. Theobald et al. (2020) determined that active learning and participation help reduce achievement gaps among students from disadvantaged groups. Yet, during the prolonged school closures and subsequent virtual learning, lack of access to devices became a genuine concern for parents and educators alike (Theobald et al., 2020). In April 2020, the Education Trust surveyed 1200 parents with children attending New York State public schools (The Education Trust, 2020). Approximately 67% of them, including those with children with disabilities, strongly supported mobile technology lending programs (Education Trust, 2020). When students do not have access to appropriate devices, they cannot participate in a manner that would typically combat the achievement gap.

Lack of Access to Reliable Internet

Lack of access to reliable internet was another contributor to the widening achievement gap for disadvantaged students (Jackson, 2021). Such students tend to have less access to the internet than their peers from higher socioeconomic backgrounds (Mitchell, 2020). The "homework gap," which refers to the least possible internet resource required by children to do classwork from their households, also tends to be wider for students from low-income neighborhoods (Mitchell, 2020). Many of these students were affected by the digital divide, which was worsened by inequities in technology between low and high-income schools that existed before the pandemic (Mitchell, 2020). Although some companies and organizations offered free resources for students to learn online (Mitchell, 2020), disadvantaged students were likely to continue having problems with resource access without proper internet connection. One study reported only 51.6% of rural U.S. residents had adequate internet access in 2018 compared to 94% of urban residents (Federal Communication Commission, 2020).

As schools closed and parents worked from home, the pressure on household-level bandwidth infrastructure became overwhelming (Lai & Widmar, 2021). Given that upgrading internet speed incurred additional financial costs, already struggling

communities became the victims of a new type of digital divide (Mitchell, 2020; Fortuna et al., 2020). Simple access to the internet with adequate speed to operate multiple devices at once became the main fallout of the digital divide (Lai & Widmar, 2021). The Pew Research Center (2020) also exposed the on-the-ground reality of internet-drought zones existing within our society. The study found that 22% of parents with homebound school children said it was very or somewhat likely that their children would have to use public Wi-Fi to finish their schoolwork because there was no reliable internet connection at home (Pew Research Center, 2020). The effects exacerbated for students with parents from lower-income backgrounds. Within this population, 40% of parents reported their children relied on public Wi-Fi to finish schoolwork (Pew Research Center, 2020).

As COVID-19 spread throughout the United States, the idea was that remote learning would help eliminate the need for physical learning spaces, thus, allowing students to access the curriculum, irrespective of geographic location. However, it is evident that decades after its inception, access to reliable internet continues to elude a vast group of people who need it most.

Lack of Technology Coordination and Insufficient Support

Even if students had the appropriate devices and access to reliable internet, their ability to fully participate in their education could be significantly influenced by technology coordination issues and insufficient support. When the pandemic hit, the American education systems found themselves in despair (Waddell, 2020). Instructors had to learn new online curricula on the go, while parents had to be more involved in their children's learning process (Waddell, 2020). Jackson (2021) averred that access issues were further complicated by a lack of coordination in the selection of internet platforms. Instructors within the same schools often used multiple communication platforms, such as Skype, Whatsapp, Google Classroom, Zoom, and MIT App Inventor. This multiplicity of technology platforms forced students and teachers to get accustomed to and download new programs and applications, often at a cost (Jackson, 2021). Individuals who were less tech-savvy or did not have the means to add new applications suffered new disadvantages (Jackson, 2021). Confusion occurred as a result of schools' inability to organize learning platforms for students (Jackson, 2021). Switching among platforms forced parents to spend additional time helping their children acclimate to the new educational landscape (Jackson, 2021).

In her 2018 publication, Sarah Lambert identified flaws in online education systems and forecasted a similar crisis well before the pandemic. Lambert (2018) criticized existing online education systems as inefficient and ineffective as nations had failed to plan for crises. It was suggested that a crisis management plan be designed to improve technical proficiency and familiarity for teachers and parents. Such a crisis management plan would have been beneficial to racial-ethnic minorities in the U.S. during the onset of the pandemic since these individuals were already at a

disadvantage prior to COVID-19. Added stress from the death of elders in the community also put a strain on parents' mental health, which further impacted their children who were already experiencing trauma from the pandemic (Fortuna et al., 2020).

Schools in low-income areas lack adequate funding to support students' mental health (Fortuna et al., 2020). If students cannot focus in school and do not have support at home, they will not progress academically. Mitchell (2020) predicted that if remote learning were to persist, children from low-income families would go for an extended period without structured learning, thus, further broadening the achievement gap between students from low-income and high-income backgrounds. Therefore, students who cannot turn in homework assignments or join class sessions would be at an increased risk of failing courses and repeating grades.

Increased Absenteeism

As many schools shifted to online instruction during the pandemic, the meaning of attendance and absenteeism also shifted. Students now had to show up online for class by logging into synchronous meetings on platforms like Zoom. Social media and news outlets showed clips of students in class with their videos off. Therefore, students could be present online but absent (otherwise engaged); thus, missing instruction. Mitchell (2020) reported that chronic absenteeism for many students during the pandemic also occurred as a result of lack of internet access. Some children had devices but lacked the internet connection needed to complete their assignments and attend their classes (Garcìa & Weiss, 2020).

Chronic absenteeism often leads to poor academic performance, which may contribute to increased drop rates in high-school students. These students are frequently of low socioeconomic status, which contributes to a lifetime of injustices in future generations of children, particularly in Latino and African American communities (Basham et al., 2020; Mitchell, 2020). Given the demographics of the student populations that would struggle with internet access (Mitchell, 2020), as well as the negative association between absenteeism and student outcomes (Garcìa & Weiss, 2020), it is apparent that certain forms of remote learning have the potential to increase the achievement gap between students of color and their advantaged counterparts (Mitchell, 2020).

Furthermore, high school graduates from low-income communities with high poverty rates have been impacted the most by COVD-19 as their enrollment in college was put on hold due to lack of devices and inadequate internet (McKenzie, 2021). The United States Congress provided K-12 schools and colleges with an eighty-two billion dollar relief package; however, it was not clear how much of those funds were used to support students adversely impacted by the pandemic (McKenzie, 2021). Because of the pandemic and pre-existing social inequalities, postsecondary institutions must now work arduously to encourage disadvantaged first-year students to enroll in college (McKenzie, 2021).

Conclusion

COVID-19 contributed significantly to the widening of the student achievement gap for disadvantaged students in the United States. While their affluent peers may have had fewer challenges, students from low socioeconomic backgrounds had difficulty making progress in a virtual classroom because of a lack of social and digital infrastructure support. If left unchecked, this gap in K-12 settings will continue to affect those students when they attempt to start college. This literature review presented several factors that negatively influenced student outcomes during the pandemic: lack of devices, lack of internet access, insufficient learner support, and inadequate support and implementation plans in the education system. The literature review acknowledged the existence of digital divides caused by social inequalities well before the COVID-19 related crisis and how these were worsened as a result. Learners and parents from disadvantaged families have shown ingenuity and resilience in finding ways to cope with the deficiencies in learning systems. But, when school systems across the country went into complete shutdown, the existing digital divide drastically limited the learning opportunities for these community members. As learning depended heavily on expensive technologies and reliable but costly internet connections, the inequality in educational opportunities started to impact overall academic outcomes, exacerbating achievement gaps.

The purpose of this literature review was to identify various factors that have negatively influenced learning outcomes for students from disadvantaged communities. Integrally linked, addressing one factor alone is insufficient to achieve lasting changes in defusing the effects of digital divides. Problems of this magnitude demand systemic change. Thus, solutions in our learning systems should ensure every learner receives the same instructional opportunities, irrespective of their socioeconomic background status.

Recommendations

To address the student achievement gap, which widened as a result of COVID-19, and to help mitigate the digital divide, the following actions are recommended:

Establish Regular Contact with Students

School systems should consider instituting methods of regular contact with each student. Such contact could be delivered through in-person meetings, phone calls, video messages, and chat messages. It could be conducted by teachers or other school personnel, like administrators, guidance counselors, and social workers. By utilizing different means of communication, school systems could access students

that are on different sides of the digital divide. Although this may seem like a labor-intensive initiative, it could help identify the students who require increased support.

Investigate the Achievement Gap Among Homeless Youth

An area of future research is the impact of COVID-19 on homeless youth. All of the reviewed articles focused on K-12 students connected to households. There were over 1.5 million homeless children in the U.S. during the 2017–2018 school year (Fernandes-Alcantara, 2020). This student population was identified as having more unique achievement gaps and lower graduation rates when compared to other disadvantaged student groups before the pandemic (Atwell et al., 2020). The Department of Education has an Education for Homeless Children and Youths Program (EHCYP) that distributes funds to state agencies to address the educational needs of homeless children (Fernandes-Alcantara, 2020). The Coronavirus Aid, Relief, Economic Security (CARES) Act also included funds for the EHCYP and other initiatives related to homeless youth. Although the government and pre-COVID-19 literature identified this target population as particularly vulnerable, the learning outcomes for students experiencing homelessness during the pandemic have not yet been carefully investigated.

Collaborate with Related Service Providers

Teachers should collaborate with related service providers (RSPs) such as speech-language pathologists. These individuals can help typically developing and neurodiverse students learn and implement strategies to increase comprehension of classroom content. Students could receive classroom support and materials to facilitate the carryover of skills at home. Such skills would help students comprehend new material better at school and outside structured classroom settings.

Develop Device Training for Caregivers

Some school districts may consider continuing with remote learning post-pandemic or allowing students to use devices at home to complete assignments. Therefore, it would be helpful for schools to train parents how to use devices to better support their children at home. We have observed that students with learning disabilities often have trouble accessing instruction through a tablet due to difficulty directing attention and difficulty typing responses during online class discussions. In such cases, the routine and consistency established in the school setting are often absent at home. School administrators or information technology personnel could train

caregivers during parent-teacher conferences or organized device training nights at school.

Offer Parent Support Groups

School districts could partner with local agencies to offer language training for parents from low-income backgrounds who speak languages other than English. Catalano et al. (2021) mentioned a concern for English Language Learners during the pandemic. These students are at an increased disadvantage when they are from low-income communities (Catalano et al., 2021). When their parents also struggle with English, it is difficult for these students to receive support at home when they encounter challenges with school work.

Understand the Importance of Low Bandwidth Parallel Instructional Strategies

Lack of access to high-speed internet and shortages of suitable learning devices indicate the need for fundamental change in instructional design. The dependency on synchronous instructional strategies, using high-end digital tools, supported often only by high bandwidth internet services has further widened the digital divide (Correia, 2020). Correia recommended teachers develop low bandwidth strategies and use asynchronous avenues to respond to the variability in student access. The publications reviewed alluded to the long-term implications of this impact. In parallel, instructional designers must consider alternative learning approaches, keeping maximized reach as a priority.

Adopt Low Bandwidth Instruction Tools

Instructional designers should create parallel learning strategies, explore asynchronous instructions suitable for low bandwidth, and easily accessible by low-end digital tools. Educators should utilize instructional tools that have been used successfully in the past, such as audio lectures, PowerPoint slides, recorded instructional content (e.g., lectures) via an online streaming service, synchronous online chat, asynchronous discussions, and collaborative documents. Educators and instructional designers could be encouraged to design parallel or alternative instructional strategies using the aforementioned low-bandwidth tools each time a new high-bandwidth teaching approach is proposed. This could be part of a “Crisis Management Strategy”

in the learning system. Planning for future crisis scenarios should be prioritized, giving precedence to maximum access to learners by any means possible.

Collaboration of Schools, Parents, and Communities

During the COVID-19 school shutdowns, parents, as well as community members, reestablished their importance in educating the new generation. Any future efforts to curb achievement gaps due to the digital divide must incorporate feedback from parents and other community members. Although the literature provides clear evidence of the widening achievement gap for disadvantaged students, there is much less written about how K-12 schools, postsecondary institutions, parents, and communities can address the current situation. There is an absence of specific initiatives that organizations and individuals can undertake to remedy the achievement gap. Thus, future research could focus on proposing precise actions.

References

Ansell, S. (2011, July 7). Achievement Gap. *Education Week.* Retrieved November 12, 2021, from https://www.edweek.org/leadership/acheivement-gap/2004/09

Atwell, M. N., Manspile, E. P., Bridgeland, J. M., & Civic. (2020). Strategies for success: Supporting students experiencing homelessness. Lessons from school and district liaisons on how to support students experiencing homelessness. In *Civic*. Civic.

Basham, J. D., Blackorby, J., & Marino, M. T. (2020). Opportunity in crisis: The role of universal design for learning in educational redesign. *Learning Disabilities: A Contemporary Journal, 18*(1), 71–91.

Catalano, A. J., Torff, B., & Anderson, K. S. (2021). Transitioning to online learning during the COVID-19 pandemic: Differences in access and participation among students in disadvantaged school districts. *International Journal of Information and Learning Technology, 38*(2), 258–270. https://doi.org/10.1108/IJILT-06-2020-0111

Center for Applied Special Technology. (2020, October 6). *Cast announces a community-driven process to update UDL guidelines*. https://www.cast.org/news/2020/community-driven-process-update-udl-guidelines

Cohen, J., & Kupferschmidt, K. (2020). Countries test tactics in "war" against COVID-19. *Science, 367*(6484), 1287–1288. https://doi.org/10.1126/science.367.6484.1287

Converse Willkomm, A. (2020, April 22). *Online vs. remote learning*. Goodwin College of Professional Studies. https://drexel.edu/goodwin/professional-studies-blog/overview/2020/April/online-vs-remote-learning/

Correia, A. P. (2020). Healing the digital divide during the COVID-19 pandemic. *Quarterly Review of Distance Education, 21*(1), 13–21.

Cowling, B. J., Ali, S. T., Ng, T. W., Tsang, T. K., Li, J. C., Fong, M. W., et al. (2020). Impact assessment of non-pharmaceutical interventions against coronavirus disease 2019 and influenza in Hong Kong: An observational study. *The Lancet Public Health, 5*(5), e279–e288.

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020, December 8). *COVID-19 and learning loss–disparities grow and students need help*. Mckinsey. https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help

Education Week. (2020, July). *The Coronavirus Spring: The historic closing of U.S. schools: A Timeline*. Retrieved from https://www.edweek.org/leadership/the-coronavirus-spring-the-historic-closing-of-u-s-schools-atimeline/2020/07

Federal Communications Commission. (2020). *2020 broadband deployment report* (Broadband Progress Report No. FCC 20-50). Broadband Progress Reports. https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf

Fernandes-Alcantara, A. L. (2020). *Support for homeless youth in the context of COVID-19: A brief overview* (Library of Congress public edition). Congressional Research Service.

Fortuna, L. R., Tolou-Shams, M., Robles-Ramamurthy, B., & Porche, M. V. (2020). Inequity and the disproportionate impact of COVID-19 on communities of color in the United States: The need for a trauma-informed social justice response. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(5), 443–445. https://doi.org/10.1037/tra0000889

Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). COVID-19 and remote learning: Experiences of parents with children during the pandemic. *American Journal of Qualitative Research, 4*(3), 45–65.

Garcìa, E., & Weiss, E. (2020, September 10). *Covid-19 and student performance, equity, and U.S education policy.* Economic Policy Institute. https://www.epi.org/publication/the-consequences-of-the-covid-19-pandemic-for-education-performance-and-equity-in-the-united-states-what-can-we-learn-from-pre-pandemic-research-to-inform-relief-recovery-and-rebuilding/

Jackson, B. L. (2021). The inequity of educational opportunity during an epidemic. *Postmodern Openings, 12*(1), 319–327.

Kettl, D. F. (2020). States divided: The implications of American Federalism for COVID-19. *Public Administration Review, 80*(4), 595–602. https://doi-org.proxyiub.uits.iu.edu/10.1111/puar.13243

Lai, J., & Widmar, N. O. (2021). Revisiting the digital divide in the COVID-19 era. *Applied Economic Perspectives and Policy, 43*(1), 458–464.

Lambert, S. R. (2018). Changing our (dis) course: A distinctive social justice aligned definition of open education. *Journal of Learning for Development, 5*(3), 225–244.

McKenzie, L. (2021). *Bridging the digital divide: Lessons from COVID-19*. Insider Higher Ed.

Mitchell, S. (2020). Ethical concerns of school closures for low-income school aged children. *Voices in Bioethics, 6*, 2691–4875. https://doi.org/10.7916/vib.v6i.7057

Nafisah, S. B., Alamery, A. H., Al Nafesa, A., Aleid, B., & Brazanji, N. A. (2018). School closure during novel influenza: A systematic review. *Journal of Infection and Public Health, 11*(5), 657–661.

Organisation for Economic Co-operation and Development. (2001). *Understanding the digital divide* (p. 49). OECD Digital Economy Papers. https://doi.org/10.1787/236405667766

Pew Research Center. (2020, April). *53% of Americans say the internet has been essential during the COVID-19 outbreak*. Retrieved from https://www.pewresearch.org/internet/2020/04/30/53-of-americans-say-the-internet-has-been-essential-during-the-covid-19-outbreak/

Pratton, J., & Hales, L. W. (1986). The effects of active participation on student learning. *The Journal of Educational Research, 79*(4), 210–215.

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*(3), 223–231.

Settles, B. (2012). Active learning. *Synthesis Lectures on Artificial Intelligence and Machine Learning, 6*(1), 1–114.

The Education Partnership. (2020, April). *Centre learning in a pandemic: Nigeria's response to teaching and learning during the COVID-19 pandemic.* https://www.tepcentre.com/wp-content/uploads/2020/08/Learning-in-a-Pandemic-Report_TEP-NESG_2020.pdf

The Education Trust. (2020, April 6). *Parent's survey identifies key needs for NewYork families navigating new reality.* Retrieved from https://s3-us-east-2.amazonaws.com/edtrustmain/wp-content/uploads/sites/5/2020/04/07121352/Coronavirus-Parent-Poll.pdf

Theobald, E. J., Hill, M. J., Tran, E., Agrawal, S., Arroyo, E. N., Behling, S., et al. (2020). Active learning narrows achievement gaps for underrepresented students in undergraduate science, technology, engineering, and math. *Proceedings of the National Academy of Sciences, 117*(12), 6476–6483.

Waddell, K. (2020, June). *Commentary: The trifecta challenge of families during COVID-19*. Retrieved from https://childcareassociates.org/the-trifecta

Yeh, S. S. (2016). *Solving the achievement gap: Overcoming the structure of school inequality*. Palgrave Macmillan.

Part III
Social Justice

Diversity, Equity, Inclusion, and Justice in Action: A Study of Learning Experience Designers' Practices

Ahmed Lachheb, Rebecca M. Quintana, Ji Hyun Yu, and Astrid N. Zamora

Diversity, Equity, Inclusion, and Justice (DEIJ) has long been a topic of discussion and action in education and learning design contexts (Calabrese Barton & Tan, 2020; Carver & Harrison, 2013; Chandler et al., 2020; Ebben & Murphy, 2014; Lambert, 2020). Although global and national events of the last two years (2019–2021), such as the systemic inequities in healthcare revealed during the pandemic and the racially-driven police violence brought to light through the murder of George Floyd, have brought increased attention to DEIJ within these contexts, little is known about how designers of learning experiences attend to DEIJ matters within their practice and how the process of infusing DEIJ into a learning design practice works.

To elicit a rich and authentic understanding of how designers implement DEIJ within a bounded context of learning design practice, we conducted a study to investigate:

- The practices of Learning Experience Designers (LXDs) in implementing DEIJ.
- The factors that influence LXDs to take up and implement DEIJ practices in their design work.
- The tensions that LXDs experience.
- The opportunities for reflection-on-action and improvement that emerge from LXDs perspectives.

In this chapter, we start by reporting on the LXD practices in implementing DEIJ to begin understanding how designers attend to DEIJ matters within their practice. Future work will explore topics beyond the practices of LXDs and include the other topics that constitute our study.

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Context of the Study

The study is focused on learning design practices at a university-wide educational design and technology development unit at the University of Michigan—a large public research-intensive university in the United States. Included in this unit's work is the design, development, and implementation/evaluation of open, online, and hybrid degree-bearing courses, for national and international audiences of learners. As of the summer of 2021, the high impact of the open learning experiences designed in this unit are

- 16 million global enrollments,
- learners from over 200 countries/nationalities,
- 96% of learners never previously attended the University of Michigan, and
- 400 thousand certificates earned by learners and over two million open learning completions.

The unit employs over 100 staff members who work across 15 different teams. The Learning Experience Design (LXD) team includes nine (9) Learning Experience Designers (LXDs) who are the focus of this study.

With the goal of designing and offering inclusive online learning experiences, the unit has recently developed and begun to use the *lenses* of DEIJ[1] as an internal design tool (Chandler et al., 2020). These DEIJ lenses are: (1) Addressing Social Inequality, (2) Finding Common Ground, (3) Recognizing and Making Explicit the Impact of Power and Privilege, (4) Including Multiple Perspectives, and (5) Valuing Individuals (See Fig. 1).

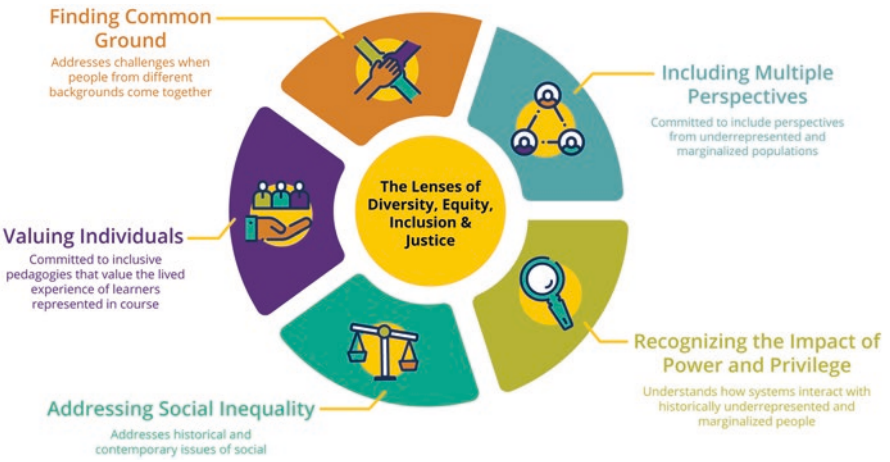

Fig. 1 A visual representations of DEIJ lenses

[1] More detailed explanation of DEIJ lenses: http://bit.ly/DEIJlenses

Through descriptive statements and guiding principles provided through each lens, LXDs use this tool to support their decisions regarding (a) overall pedagogy (i.e., the set of strategies or methods an instructor uses to teach), (b) content (i.e., materials and resources provided to learners), and (c) learning activities and assessments (i.e., opportunities for practice and graded assignments).

By viewing course design decisions and suggested topics, materials, and resources through the five lenses, LXDs can use the tool to guide design discussions, surface important questions, and potentially make recommendations that would create a more DEIJ-oriented course. For example, the Including Multiple Perspectives lens encourages course creators to include epistemological perspectives from underrepresented and marginalized populations deliberately. With this perspective in mind, LXDs can encourage instructors to seek out readings, datasets, and other teaching materials authored or created by individuals from underrepresented groups. For LXDs, this could mean examining suggested course materials through the lens and pointing out aspects of the course design that could come into sharper DEIJ-focus by actively seeking out diverse perspectives. For instructors, this could mean locating references that they have not used previously in their course syllabi. Used in this way, each lens calls attention to aspects of the course design that could be strengthened, making DEIJ a more central part of the design.

The DEIJ lenses were adopted and adapted (with permission) from a framework from a national center situated within the University, the National Center for Institutional Diversity (NCID, 2019), for use in online learning design contexts. The NCID's original framework offers statements and guiding questions to support diversity research and scholarship. With the University's renewed focus on DEIJ and the recent growth of online learning experiences, the LXD team believed it was crucial to bring DEIJ lenses explicitly into their learning design work, which includes overt DEIJ discussions and collaborations with faculty and other University's stakeholders.

Significance of the Study

Little is known about how learning designers infuse DEIJ into their design practice, what learning design practitioners make of this construct, and the factors that influence them to take up and carry out the work. Similar to instructional design theories and models, DEIJ lenses and frameworks can benefit from empirical investigations that describe how they work in situ in order to highlight the tensions and opportunities surrounding them and bring an authentic description of how practitioners put them to use. Knowledge of design practitioners and their design work in situ are valuable as several design scholars have commented (Cross, 2001; Nelson & Stolterman, 2014; Stolterman et al., 2009; Schön, 1983, 1987). By appreciating and studying practitioners' knowledge and their ways of work, we—learning design scholars—are able to develop a rich understanding of design practice, to introduce design tools grounded in practice, to develop practical pedagogies for educating future designers, and to suggest ways that we can improve design

practice. Contemporary learning design scholarship emphasizes the need to study learning design practitioners and their in situ practices, because prescriptive inquiry—guided by prescriptive design models and theories—offers limited insights into how learning design actually happens (Boling et al., 2017; Gray et al., 2015; Lachheb & Boling, 2018; Rowland, 1992; Sentz et al., 2019; Sentz & Stefaniak, 2019; Stefaniak et al., 2020; Smith & Boling, 2009; Tracey & Boling, 2014).

DEIJ in Higher Education

Many institutions of higher education not only publicly advocate for DEIJ but also have committed to making DEIJ obvious in their campuses and classrooms (c.f., Chandler et al., 2020). For instance, in 2019, the University of Michigan announced a 50 million dollar investment to "end educational privilege."[2] These DEIJ goals extend to online learning experiences in higher education as institutions continue to expand their educational offerings beyond physical campuses. Oftentimes, universities' efforts in online learning spaces aim to provide less costly or free educational experiences (e.g., MOOCs, free webinars). Such efforts often align with DEIJ values, since they allow greater access to those without the privilege of financial resources and geographical access (e.g., universities, researchers, and scholars; Carver & Harrison, 2013). However, there is still much work to be done beyond bringing lower-cost experiences to global learners (Ebben & Murphy, 2014; Literat, 2015). As such, learning design efforts must rise to the challenge of bringing innovative approaches that serve global learners through the lenses of DEIJ.

For this study, we reviewed the Association of American Colleges and Universities (AAC&U)'s definitions of the first three key terms in DEIJ: diversity, equity, and inclusion, as displayed in the following table (Table 1). While the AAC&U does not provide a definition for the term *social justice*, to us it means the foundational

Table 1 DEIJ terms' definitions by AAC&U (n.d)

Term	AAC&U definition
Diversity	The individual differences (e.g., personality, prior knowledge, and life experiences) and group/social differences (e.g., race/ethnicity, class, gender, sexual orientation, country of origin, and ability as well as cultural, political, religious, or other affiliations) (para. 5).
Equity	The creation of opportunities for historically underserved populations to have equal access to and participate in educational programs that are capable of closing the achievement gaps in student success and completion (para. 5).
Inclusion	The active, intentional, and ongoing engagement with diversity—In the curriculum and in communities (intellectual, social, cultural, geographical) with which individuals might connect—In ways that increase awareness, content knowledge, cognitive sophistication, and empathic understanding of the complex ways individuals interact within systems and institutions (para. 6).

[2] Source: University of Michigan president announces $50M investment in academic innovation

principle that everyone has the right to equal protection of laws, regulations, and policies, that create better outcomes for the communities (Calabrese Barton & Tan, 2020).

Methods

Theories Guiding This Study

Nelson and Stolterman's (2014) is the general theoretical framework for this study. It helps us frame what design is, how it occurs, and what role the designer plays in the design process. Through this theoretical framework, we view design as natural human activity: "Humans did not discover fire—they designed it" (p. 11). Design in this sense is a unique approach to life and different from other human approaches, such as science and art. It is an activity in service to others—people and organizations—and a way of inquiry. Through this theoretical lens, we also view the designer as the guarantor of the design, not the process or the model they follow (Nelson & Stolterman, 2014).

In an effort to understand how LXDs of online learning experiences engage with DEIJ in their design practice, we are applying an extended version of the Theory of Planned Behavior (TPB; Ajzen, 1991) as a theoretical framework. TPB has been widely used to predict and understand people's intentions to perform a certain behavior in a variety of settings. In TPB, intention is defined as an anticipated outcome based on attitude (beliefs about the positive/negative consequences of the behavior), subjective norm (beliefs about the normative expectations of others), and perceived behavioral control (beliefs about the presence of factors that may enhance or impede performance of the behavior) (Ajzen & Kruglanski, 2019). TBD in this sense affords us to describe LXD's practice with DEIJ, through their intentions in performing online learning design work.

Research Question and Study Design

Given the exploratory nature of the study, we began our inquiry by asking: What practices do learning experience designers use to put the DEIJ lenses into practice? We followed a qualitative case study design to empirically analyze how LXDs integrate the DEIJ lenses in online course design within a real-life context (Thomas, 2011). Following Yin's case study design (2014), we performed the following steps: theoretical framework selection and development, case selection, data collection protocol design, data collection, and data analysis. Our study aims to produce an in-depth description and analysis of a bounded system (Merriam & Tisdell, 2015),

where LXDs' design practices—as individuals as well as collective action—cannot be separated from the context (Yin, 2014, 2017).

Researcher's Roles and Positionality

We (the authors) are a research team consisting of three LXDs and one doctoral candidate at the University of Michigan. We believe in the importance of connecting learning design research to practice and aspire to generate good outcomes through these connections. Although we have similar academic credentials, we have diverse cultural backgrounds and professional and personal experiences. We believe that our diversity adds a valuable dimension to our inquiry work and how we collaborate. We approached this study with care and thoughtfulness. Our research goal is descriptive in nature as we do not want to insert our own biases or perspectives into the research.

Study Participants

We report participants' biographical information and background in an aggregated manner, in order to provide an extra layer of anonymity for the participants given the scope of the study. Of nine (9) LXDs we recruited, seven (7) agreed to participate in the study. Participants' professional learning design experience ranged from two years to 24 years. Each LXD reported that they have advanced graduate training (master's or a doctorate in learning design or closely related field). The participants have diverse professional and academic backgrounds ranging from higher education, K-12 settings, and non-profit/corporate settings. They have reported—self-selected—diverse social identities, such as the identity of an "educator," "academic and professional," "middle-class individual," and of a "racial minority."

All of the participants hold the job title of a "Learning Experience Designer." The unit's leadership chose this job title in order to foreground a commitment to learner-centric design and the expectation that learning designers are equipped with knowledge of instructional design, iterative user experience design, and education theory.[3]

[3] More about LXD role at the University of Michigan

Data Collection

We invited nine (9) Learning Experience Designers working at a university-wide design unit, in a large public and research-intensive university in the United States to participate in the study. Participants completed an online consent form and responded to questions on their design experience with DEIJ (see Appendix A). Additionally, all interested participants were recruited and invited to participate in a follow-up interview to gain further insights into their design experience with DEIJ, such as specific practices used in implementing the DEIJ lenses. The interview focused on getting deeper-level statements from participants on their experience implementing the DEIJ lenses into their practice, based on their questionnaire responses (see Appendix B). Upon the completion of the interview, we presented participants with a $20 gift card as a token of appreciation for their time. We recorded and transcribed the interviews for data analysis. Each interview lasted approximately 60 min.

Data Analysis

We analyzed the quantitative data gathered from the questionnaire using descriptive statistics techniques (i.e., frequency and distribution). Most of the findings from the questionnaire were used to guide the interview questions. As such, we view the quantitative and qualitative data to be complementary in our research effort.

We analyzed the interview data following Saldaña's (2016) multiple-cycles coding process. From each interview transcript, we extracted statements that were found to be relevant to the research question. We coded these statements using a summative and interpretive process following an inductive coding approach as recommended by Saldaña (2016) for exploratory studies. For the first coding cycle, we relied on the *concept codes* method: "Concept codes assign meso or macro levels of meaning to data or to data analysis work in progress […]. A concept is a word or short phrase that symbolically represents a suggested meaning broader than a single item or action" (Saldaña, 2016, p. 119). In the second cycle of the coding process, we grouped codes together into *categories* through axial coding (Merriam & Tisdell, 2015; Saldaña, 2016). These categories include codes that relate to each other to arrive later at general (and more abstract) descriptions of LXDs' practices in implementing DEIJ. Using an iterative coding process, we held multiple meetings to discuss our data analysis work and arrived at a mutual understanding of what each statement means. We attempted to stay trustworthy and well-grounded in the meaning of participants' statements. We constantly reminded ourselves of our central research goal—to provide a rich description of LXDs' practice with DEIJ, without judgment or criticism.

Findings

Questionnaire Findings

We gathered initial insights about LXD's broad conceptualization of DEIJ applied to their design work, as we report in the following table (Table 2).

Interviews Findings

We extracted and analyzed 36 statements where LXDs reported specific practices in implementing DEIJ lenses and removed filler words such as "uh," "um," and "like," and any identifying information was removed. We found that LXDs' practices

Table 2 LXDs' thinking about DEIJ

Question	Aggregated LXDs' Answers
Familiarity with the DEIJ lenses	80% moderately familiar
	17% very familiar
	3% somewhat familiar.
Confidence in applying the DEIJ lenses	57.2% moderately to very confident
	42.8% slightly to somewhat confident
DEIJ lenses Most/least confident with	*Valuing individuals* and *including multiple perspectives lenses—100%* moderately to very confident.
	Recognizing and making explicit the impact of power and privilege and *the addressing social inequality* lenses—43% slightly to somewhat confident
Ability to implement the DEIJ lenses	28.5% always
	28.6% often
	42.9% sometimes
Motivation to integrate DEIJ in LXD work	28.6% extremely motivated
	57.1% very motivated
	14.3% moderately motivated
Usefulness of DEIJ lenses in helping students achieve learning goals	51.4% extremely useful
	28.6% very useful
	20% moderately useful
Challenge in applying DEIJ lenses	5.7% very challenging
	20% challenging
	31.4% neutral
	37.1% easy
	5.8% very easy
Most challenging DEIJ lens to apply	*Recognizing and making explicit the impact of power and privilege*—57.1% challenging, 14.3% very challenging
Least challenging DEIJ lens to apply	*Valuing individuals*—42.9% easy, 28.6% very easy

belonged to four categories as follows: (1) Developing and Employing Shared Team Practices; (2) Asking Questions and Seeking Answers; (3) Consulting & Leading; (4) Employing Specific Design Methods/Approaches for DEIJ.

Developing and Employing Shared Team Practices

This category represents DEIJ practices LXDs mentioned in reference to the team's general practices. In a way, these practices constitute a "safety net" for LXDs' work since they are commonly practiced not only by an individual LXD—it is *what they do as a team*. For example, one LXD reported how they were aligning their practices with other LXDs saying:

> It's like a jumping-off point or entry point where we start having conversations about these things. And each of these topics and how they can manifest both in course design, but I also think about them from a process side of things, and how we're working together as a team and thinking through team dynamics.

Similarly, another LXD mentioned:

> The LXD Team is talking about things like, what's the input, what's the angle, and can we take this strategy. So then I thought, the personas would be a good place to start. We found ways to have conversations, and then came strategies and tools to introduce the lenses.

Asking Questions and Seeking Answers

This category represents a general approach or technique that LXDs rely on in order to frame their design projects, start conversations with faculty, gather insights from multiple stakeholders, and seek answers. Asking questions and seeking answers is done independently by the LXD and/or with faculty collaborators—it is what they do internally/implicitly and/or externally/explicitly.

For example, one LXD reported how they start asking framing questions internally at the beginning of a design project:

> The first thing I think about is, who am I addressing, right? That's the big question we start with. Who is this course for and how will this help?

On the other hand, several LXD reported how they are asking guiding and questions to their faculty collaborators:

> There was a faculty team that wanted to interview some experts in their field that they had contact with […]. And one of the questions that we raised was who are we showcasing here as experts? Is it a diverse group? Are there other people that we could call on to try to increase the diversity of who were showing as experts in the field?

Consulting and Leading

This category represents the LXDs' own efforts in generating concrete ideas and suggestions for faculty, as well as making specific design decisions about how to implement the DEIJ lenses. LXDs in this regard held two distinct roles that they alternate between—a consulting role where they suggest ideas, and a coaching role where they make efforts to increase faculty buy-in and readiness and make certain decisions in order to move forward. For instance, several LXDs mentioned brainstorming and suggesting concrete ideas to their faculty collaborators:

> I encourage my faculty members to create some language to build up some community participation rules and by having that standard language they can be more careful in trying to respect each other.

Other LXDs also reported their practice of coaching faculty/collaborators:

> The practice of talking to faculty. I have a sense that they [faculty] appreciated being able to have these conversations to unpack topics from a learning experience perspective and also the fact that we wanted to include or design these into the courses.
>
> I help faculty realize that we can be vulnerable, even though you are the instructor of the classroom. That should be the first step to address social inequality, because that sheds light on different spots. So, this is one of the ways I try to help faculty build sort of rapport in the classroom.

Employing Specific Design Methods and Approaches for DEIJ

This category represents specific methods and approaches that LXDs reported because they are exclusive to implementing DEIJ lenses only—they are *contextual design methods* that LXDs came up with to implement DEIJ lenses. For example, two LXDs reported how they drew DEIJ-focused learner-personas:

> By using the personas, it allowed them [faculty] to really articulate how we could implement these lenses and what that could look like in a learning experience.
>
> We had these conversations about why these personas are not only important from a design perspective but also thinking about it from a DEIJ perspective. In the end, it resonated with [faculty] so much that during the content development process for this course, faculty interviewed experts from the field and included questions about DEIJ.

Other LXDs reported how they integrate DEIJ considerations into design consultations:

> If I directly start the conversation by mentioning inequality or privilege that can cause some kind of miscommunication. I have to integrate what [faculty] are expecting, but I don't want to separate big topics from my teaching and learning consultation, which means I really want to combine those two things [referring to lenses and consultation] into one universal approach.

Similarly, one LXD reported how they purposefully outlined DEIJ goals for each project and planned to check them throughout the lifecycle of the design project:

> During the new proposal process I ended up sharing the lenses with a faculty member and from there, she and I worked together to craft some design goals related to each of the lenses. So, this has been one of my kind of things that I have been trying to make a practice of mine is helping faculty members walk through and clearly delineate goals related to design and the lenses so that we can kind of come back to them and say, hey did we do this thing that we said we were going to do. You know we write learning outcomes for learners all the time, let's make these same actionable goals for ourselves, and then go back and look and see if we did these things.

Discussion

The questionnaire findings of the study indicate an overall good comfort level, readiness, and commitment from the LXDs we studied to implement DEIJ into their design work. This could be partially explained by the institutional support that they enjoy, which helps them purposefully bring DEIJ dimensions to their work. Additionally, it can also be explained by their own commitment to the values of DEIJ and the good outcomes of DEIJ efforts. After all, DEIJ dimensions are intertwined with design ethics and stem from the social identities of each professional designer (de Alvarez & Dickson-Deane, 2018). In this regard, we cannot frame DEIJ work as a top-down institutional mandate, but rather an active professional engagement by the designer, in a bottom-up fashion.

The same findings also point to how the designers' thinking about DEIJ lenses is nuanced and variable. LXDs in this study found some DEIJ lenses harder to apply than others and reported varying comfort levels with their use. It has been documented in the learning design literature that it is sometimes difficult for designers to put theories into practice due to their abstract nature (c.f., Yanchar et al., 2010). Therefore, if we only consider the questionnaire findings, questionnaire findings, it is safe to speculate that LXDs are experiencing successes and tensions while engaging in DEIJ design work—a subject of further inquiry and follow-up to our exploratory research.

The interview findings offer an additional understanding of the LXDs' practices in implementing DEIJ. Looking at the four categories of practices that LXDs reported, we see diverse practices that are not necessarily aligned with a certain design theory or a model. First, LXDs realized the importance of establishing a team approach to DEIJ. This speaks to their aspiration for a unified commitment in doing DEIJ-focused design work, which in turn increases trustworthiness and credibility when evoking certain design judgments and decisions (Gray et al., 2015; Boling et al., 2017). Second, LXDs felt comfortable switching between two professional roles—one of a design consultant and one of a designer. While the former indicates an approach where the LXD encourages decisions to be made, the latter indicates a leading approach where the LXDs make design decisions independently or in partnership (Rowland, 1992; Sugar & Moore, 2015; Leung et al., 2021). Last, LXDs' use of specific methods and approaches to exclusively implementing DEIJ lenses speaks to a high level of design expertise among the

participants—experienced designers craft new "designerly methods" independent of available tools or approaches (Lachheb & Boling, 2018; Stolterman et al., 2009).

Implications

Despite the basic premise of our inquiry and its exploratory nature, we believe that our findings offer implications for learning design education and research. Learning and instructional design educators can use the findings of this study to introduce class activities, projects, and even portfolio competencies that target DEIJ-focused learning design work. As we have found in this study, DEIJ-focused design work is a professional expectation. Also, the capacity of designers to craft design methods/approaches for DEIJ relates to designers' expertise (Lawson & Dorst, 2013). We recommend introducing DEIJ into the training of future learning designers in an organic way, thus, folded into discussions and training on design ethics, and/or on designers' judgment and decision making (Lachheb & Boling, 2021). This approach entails a pedagogical structure that allows designers-in-training to experiment, iterate, fail in a productive manner (Gray et al., 2020), and constantly improve their actions through reflection.

Learning and instructional design scholars can use these findings to expand the way they think about the learning design process and the profession overall. As we highlighted, none of the LXDs' practices in implementing DEIJ seem to align with a well-known design theory or a model, which begs the question of how useful are our design theories and models if they fail to serve designers in their work (Smith & Boling, 2009; Yanchar et al., 2010). In return, learning design scholarship could engage in finding design tools—in the broad sense of the term—that designers appreciate and place at their service (Lachheb & Boling, 2018; Stolterman et al., 2009). We think that continuing to explore the topic DEIJ in learning design in relation to design ethics and designers' expertise could bring additional interesting dimensions to our understanding of how learning designers work. We can also train future designers to become competent professionals, capable of introducing a positive change into the world, through the power of learning design.

Conclusion

Through our larger inquiry effort, we attempt to elicit a rich and authentic understanding of how designers implement DEIJ within a bounded context of learning design practice. In this chapter, we report on the LXD practices in implementing DEIJ in order to begin understanding how designers attend to DEIJ matters within their practice. We believe that our findings could be put to good use by learning/instructional design educators and scholars. These findings also make us more curious about the factors that influence LXDs to take up and implement DEIJ practices

in their design work, the tensions that they experience, and the opportunities for reflection-on-action and improvement that emerge from their experiences—topics of our further inquiry.

Appendices

Appendix A: Questionnaire Items

Q1. Using the Likert scale below, please indicate your familiarity with the 5 components of DEIJ lenses:

	1-Not at all familiar (1)	2-Slightly familiar (2)	3-Somewhat familiar (3)	4-Moderately familiar (4)	5-Very familiar (5)
Addressing social inequality	o	o	o	o	o
Finding common ground	o	o	o	o	o
Recognizing and making explicit the impact of power and privilege	o	o	o	o	o
Including multiple perspectives	o	o	o	o	o
Valuing individuals	o	o	o	o	o

Q2. How confident are you in applying the DEIJ lenses into your design practice?

1. Not at all confident
2. Slightly confident
3. Somewhat confident
4. Moderately confident
5. Very confident

Q3. Using the Likert scale below, please indicate how confident you feel with each the 5 components of DEIJ lenses:

	1-Not at all confident (1)	2-Slightly confident (2)	3-Somewhat confident (3)	4-Moderately confident (4)	5-Very confident (5)
Addressing social inequality	o	o	o	o	o
Finding common ground	o	o	o	o	o

	1-Not at all confident (1)	2-Slightly confident (2)	3-Somewhat confident (3)	4-Moderately confident (4)	5-Very confident (5)
Recognizing and making explicit the impact of power and privilege	o	o	o	o	o
Including multiple perspectives	o	o	o	o	o
Valuing individuals	o	o	o	o	o

Q4. To what extent have you been able to implement the DEIJ lenses into your work?

1. Never
2. Rarely
3. Sometimes
4. Often
5. Always

Q5. Do you personally feel motivated or unmotivated to integrate DEIJ in your learning experience design work?

1. Not at all motivated
2. Slightly motivated
3. Moderately motivated
4. Very motivated
5. Extremely motivated

Q6. Using the Likert scale below, please indicate how useful you think applying each of the 5 DEIJ lenses would be to help students achieve learning goals in the course:

	1-Not at all useful (1)	2-Slightly useful (2)	3-Moderately useful (3)	4-Very useful (4)	5-Extremely useful (5)
Addressing social inequality	o	o	o	o	o
Finding common ground	o	o	o	o	o
Recognizing and making explicit the impact of power and privilege	o	o	o	o	o
Including multiple perspectives	o	o	o	o	o
Valuing individuals	o	o	o	o	o

Q7. Using the Likert scale below, please indicate how challenging you think it would be to apply each of the 5 DEIJ lenses into your design practice:

	1-Very challenging (1)	2-Challenging (2)	3-Neutral (3)	4-Easy (4)	5-Very easy (5)
Addressing social inequality	o	o	o	o	o
Finding common ground	o	o	o	o	o
Recognizing and making explicit the impact of power and privilege	o	o	o	o	o
Including multiple perspectives	o	o	o	o	o
Valuing individuals	o	o	o	o	o

Q8. My total years of experience as a learning design professional is approximately_____

Q9. My highest degree earned is:

- Bachelor's
- Master's
- Doctorate (Ph.D. or Edd)

Q10. Would you like to participate in a follow-up interview at your convenience? This interview will not last more than 50–60 minutes and you will get either a $20 Amazon or Starbucks e-gift card as a token of appreciation.

- Yes
- No

Q11. Thank you for your interest in participating in the online interview! Please indicate your name and email in the following line and I will contact you to schedule an interview. _____

Appendix B: Interview Protocol

Italics = moderator script
Plain text = interview questions/probes and notes

Start of Interview

Greet the participant, and thank them for agreeing to participate. Introduce myself to the participant and have them introduce themselves to establish natural rapport.

Today I'd like to ask you a few questions about your overall experience implementing the DEIJ lenses into your practice based on your survey responses. You are free to decline to answer any questions or to terminate the interview at any time. Your responses will not affect your position at CAI in any way. With your

permission, I will be recording this interview. I will do my best to make sure that all personal information discussed today is kept confidential.

Obtain Verbal Consent for Audio Recording

After the interview, I will review the Zoom transcript saved from the interview and remove any names.

Start Audio Recording

Do you have any questions for me before we get started?
Interviewer shares screen to showcase DEIJ Lenses

Part I: Questions Related to Specific Practices LXDs Implement to Translate DEIJ Lenses into Practice/Showcase of Work

Background

- In your own words, how would you **describe** the purpose of the DEIJ lenses?
- In the survey questionnaire, you have indicated that you find the DEIJ lenses [**insert participant response from Likert scale question**] useful to help students achieve learning goals in the course.

Attitude

- With the example you are sharing with me today, how would you describe your attitude toward applying the DEIJ lenses?
- In the survey, you indicated that you find the DEIJ lenses [**insert participant response from Likert scale question**] challenging for you to apply to your design practice. With the example you are sharing with me today, could you elaborate on the level of challenge you experienced when applying the DEIJ lenses when developing this example. We can neither discuss all or as many lenses as you'd like.

Subjective Norms

- What level of **faculty satisfaction** did you believe was associated with applying the DEIJ lenses to the example you shared with me today?
- What are your beliefs regarding **professional peers', not necessarily at your unit, opinions** towards applying DEIJ lenses to design practices in general?

- What are your beliefs regarding your **institution's leadership's opinions** towards applying DEIJ lenses to your design practice?

Perceived Behavioral Control

- What types of **resources** did you find were needed to support the integration of the DEIJ lenses into the example you shared with me today?
- What are your beliefs regarding the **availability** of those resources at your institution?

Intention for Future Implementation

- To what extent do you intend to **implement** the DEIJ lenses into your future work?*As a token of your participation, we will be providing you with a gift card as mentioned in the consent form. I'll follow up with you to discuss those details within the next few days.*

References

AAC&U. (n.d.). *Making excellence inclusive*. https://www.aacu.org/making-excellence-inclusive

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I., & Kruglanski, A. W. (2019). Reasoned action in the service of goal pursuit. *Psychological Review, 126*(5), 774. https://doi.org/10.1037/rev0000155

Boling, E., Alangari, H., Hajdu, I. M., Guo, M., Gyabak, K., Khlaif, Z., Kizilboga, R., Tomita, K., Alsaif, M., Lachheb, A., Bae, H., Ergulec, F., Zhu, M., Basdogan, M., Buggs, C., Sari, R., & Techawitthayachinda, R. I. (2017). Core judgments of instructional designers in practice. *Performance Improvement Quarterly, 30*(3), 199–219. https://doi.org/10.1002/piq.21250

Calabrese Barton, A., & Tan, E. (2020). Beyond equity as inclusion: A framework of "rightful presence" for guiding justice-oriented studies in teaching and learning. *Educational Researcher, 49*(6), 433–440. https://doi.org/10.3102/0013189X20927363

Carver, L., & Harrison, L. M. (2013). MOOCs and democratic education. *Liberal Education, 99*(4), n4.

Chandler, B. C., Quintana, M. R., Tan, Y., & Yang, N. (2020, April 17–21). *Diversity, equity, and inclusion in MOOCs: Mapping goals from proposal to design* (Conference paper). AERA 2020 Virtual Annual Meeting (Conference canceled). https://ai.umich.edu/wp-content/uploads/2020/06/Diversity-Equity-Inclusion-in-MOOCs-AERA-2020-1.pdf

Cross, N. (2001). Designerly ways of knowing: Design discipline versus design science. *Design Issues, 17*(3), 49–55. https://doi.org/10.1162/074793601750357196

de Alvarez, M. S., & Dickson-Deane, C. (2018). Avoiding educational technology pitfalls for inclusion and equity. *TechTrends, 62*(4), 345–353. https://doi.org/10.1007/s11528-018-0270-0

Ebben, M., & Murphy, J. S. (2014). Unpacking MOOC scholarly discourse: A review of nascent MOOC scholarship. *Learning, Media and Technology, 39*(3), 328–345. https://doi.org/10.1080/17439884.2013.878352

Gray, C. M., Dagli, C., Demiral-Uzan, M., Ergulec, F., Tan, V., Altuwaijri, A. A., Gyabak, K., Hilligoss, M., Kizilboga, R., Tomita, K., & Boling, E. (2015). Judgment and instructional design: How ID practitioners work in practice. *Performance Improvement Quarterly, 28*(3), 25–49. https://doi.org/10.1002/piq.21198

Gray, C. M., Parsons, P., & Toombs, A. L. (2020). Building a holistic design identity through integrated studio education. In *Educational technology beyond content* (pp. 43–55). Springer.

Lachheb, A., & Boling, E. (2018). Design tools in practice: Instructional designers report which tools they use and why. *Journal of Computing in Higher Education, 30*(1), 34–54. https://doi.org/10.1007/s12528-017-9165-x

Lachheb, A., & Boling, E. (2021). The role of design judgment and reflection in instructional design. In J. K. McDonald & R. E. West (Eds.), *Design for learning: Principles, processes, and praxis*. EdTech Books. https://edtechbooks.org/id/design_judgment

Lambert, S. R. (2020). Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18. *Computers & Education, 145*, 103693. https://doi.org/10.1016/j.compedu.2019.103693

Lawson, B., & Dorst, K. (2013). *Design expertise*. Routledge.

Leung, J., Lachheb, A., Abramenka-Lachheb, V., & Seo, G. Z. (2021). Managing instructional design projects in higher education. In J. E. Stefaniak, S. Conklin, B. Oyarzun, & R. M. Reese (Eds.), *A practitioner's guide to instructional design in higher education*. EdTech Books. https://edtechbooks.org/id_highered/managing_instruction

Literat, I. (2015). Implications of massive open online courses for higher education: Mitigating or reifying educational inequities? *Higher Education Research & Development, 34*(6), 1164–1177. https://doi.org/10.1080/07294360.2015.1024624

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. Wiley.

National Center for Institutional Diversity (NCID). (2019, October 21). *Framework for diversity scholarship*. https://lsa.umich.edu/ncid/research-scholarship/statement-on-diversity-research-and-scholarship.html

Nelson, H. G., & Stolterman, E. (2014). *The design way: Intentional change in an unpredictable world*. MIT Press. https://doi.org/10.7551/mitpress/9188.001.0001

Rowland, G. (1992). What do instructional designers actually do? An initial investigation of expert practice. *Performance Improvement Quarterly, 5*(2), 65–86. https://doi.org/10.1111/j.1937-8327.1992.tb00546.x

Saldaña, J. (2016). *The coding manual for qualitative researchers*. Sage.

Schön, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. Jossey-Bass.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Sentz, J., Stefaniak, J., Baaki, J., & Eckhoff, A. (2019). How do instructional designers manage learners' cognitive load? An examination of awareness and application of strategies. *Educational Technology Research and Development, 67*(1), 199–245. https://doi.org/10.1007/s11423-018-09640-5

Sentz, J., & Stefaniak, J. (2019). Instructional heuristics for the use of worked examples to manage instructional designers' cognitive load while problem-solving. *TechTrends, 63*(2), 209–225. https://doi.org/10.1007/s11528-018-0348-8

Smith, K. M., & Boling, E. (2009). What do we make of design? Design as a concept in educational technology. *Educational Technology, 49*(4), 3–17.

Stefaniak, J. E., Reese, R. M., & McDonald, J. K. (2020). Design considerations for bridging the gap between instructional design pedagogy and practice. *The Journal of Applied Instructional Design, 9*(3). https://dx.doi.org/10.51869/93jsrmrjkmd

Stolterman, E., McAtee, J., Royer, D., & Thandapani, S. (2009). *Designerly tools*. http://shura.shu.ac.uk/id/eprint/491

Sugar, W., & Moore, R. L. (2015). Documenting current instructional design practices: Towards a typology of instructional designer activities, roles, and collaboration. *The Journal of Applied Instructional Design, 5*(1). https://digitalcommons.odu.edu/stemps_fac_pubs/104

Thomas, G. (2011). A typology for the case study in social science following a review of definition, discourse, and structure. *Qualitative Inquiry, 17*(6), 511–521. https://doi.org/10.1177/1077800411409884

Tracey, M. W., & Boling, E. (2014). Preparing instructional designers: Traditional and emerging perspectives. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (4th ed., pp. 653–666). Springer. https://doi.org/10.1007/978-1-4614-3185-5_52

Yanchar, S. C., South, J. B., Williams, D. D., Allen, S., & Wilson, B. G. (2010). Struggling with theory? A qualitative investigation of conceptual tool use in instructional design. *Educational Technology Research and Development, 58*(1), 39–60. https://doi.org/10.1007/s11423-009-9129-6

Yin, R. (Ed.). (2014). *Case study research: Design and methods* (5th ed.). Sage.

Yin, R. K. (2017). *Case study research and applications: Design and methods*. Sage.

Factoring Power and Positionality into Research on Instructional Design Interventions

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Many studies in instructional design technology (IDT) research are based on specific educational/learning interventions, which scholars, educators, and designers implement for the purpose of studying, improving, and advancing knowledge on learning. In IDT scholarship, researchers, educators, and designers are positioned as powerful agents of change operating with good intentions. On the one hand, this positioning is valid, because IDT professionals have knowledge and tools that learners do not have. However, it is not clear whether issues of power and positionality are foregrounded in IDT scholarship, and whether there is an explicit acknowledgment of such power and positionality. These questions do arise in conceptual publications (Moore et al., 2014; Subramony, 2004, 2016, 2018), in argumentation regarding design models (Thomas et al., 2002; Young, 2008), and in design cases (Howard & Das, 2019; Gyabak, 2020; Stefaniak et al., 2020; Tracey & Unger, 2010). However, do they arise in research studies where interventions are implemented and conclusions, petite or grand, are drawn? For instance, de Alvarez and Dickson-Deane (2018) argued for the need for new educational technologies and emergent pedagogical practices to "… originate from a deeper understanding and respect for cultures, socialization, and development" (p. 351). This argument stems

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from the fact that design frameworks/models do not discourage such considerations, but deliberate and attentive learning design approaches are needed in order to make them saliently displayed through the learning design.

Theories Guiding This Study

Multiple theories guide our inquiry and the way we approach this analysis. These theories, despite their diverse perspectives and focus, complement each other: *critical theory*, *design theory*, and *methodological research theory*. Critical theory places an emphasis on power differentials "embodied in [human] cognition, speech, and action" (Habermas et al., 1984). Through a critical theory lens, scholars are taught to foreground who has power over others, and what the power differentials are between actors engaged in basic human competencies, such as speaking and understanding, judging, and acting (Bohman, 2003). Similarly, one of the main tenets of critical race theory (CRT) is challenging dominant ideology (Solórzano & Yosso, 2002) in order to value the voices, standpoints, paynephenomenology, and/or stories of marginalized groups of people (Payne & Hamdi, 2009).

In design theory, Nelson and Stolterman (2012) have described how designers engage in different types of power relationships with others. Although this design theory acknowledges how the power relationships can be distorted, Nelson and Stolterman (2012) have argued that designers must be the guarantor of design (or g.o.d as they intentionally acronymized the term). Thus, designers' powers allow them to be responsible for the success and/or the failure of their design work. On the other hand, Monteiro (2019) has examined the concept of designers' power, arguing that some designers are ruining the world, and calling to license designers before they are allowed to practice design.

Several research methodologists, most notably those who put forward frameworks for qualitative inquiry, have emphasized the importance of discussing researchers' own positionality in their scholarship. Creswell and Poth (2018) for instance recommend that researchers openly discuss their values, biases, and experiences with the subject of their inquiry through a process called *bracketing*. This process allows highlighting the researcher's position and their social location in order to address "[…] issues of power and seek to reveal these relationships hidden within the research process" (Mao et al., 2016, p. 6).

Bracketing and Positionality of Researchers/Authors

Acknowledging our own values and biases is important to establish transparency and trustworthiness for this study. Several inquiry methodologists recommend that we, researchers, overtly discuss our values, biases, and experiences with the focus of the study using the process of bracketing. Creswell and Poth (2018) define

bracketing as […] "a matter not of forgetting what has been experienced but of not letting past knowledge be engaged while determining experiences" (p. 77). That being said, we are mandated to account for our personal views on what good research in IDT looks like, and approach our analysis work from the theoretical lenses that we subscribe to. We are six scholars; one a member of faculty, one a professional learning designer in higher education, one a postdoc in the field, and three current doctoral students. We come from five countries (two from the U.S.) and each has lived, studied and/or worked for several years in situations where we are, or have been, considered members of a minority group, or considered to be foreigners. However, none of us has experienced lifelong discrimination or oppression as a member of a traditionally marginalized group. We acknowledge that we are drawing both on experiences from our lives as well as from a critical stance toward research and practice in design to motivate this research, but also on what some of us see in practical terms as a desire to address an acknowledged lack in the field. We all share as well, and to one degree or another, concern for the impact that design has in the world and how that impact intersects with power and positionality.

Research Questions

The study poses the following research questions:

- (RQ1): Is there discernible evidence in these studies of learning design interventions that the power and positionality of researchers have been considered in designing and conducting the study?
- (RQ2): Is there discernible evidence in these studies of learning design interventions that power and positionality have been considered while drawing research conclusions?

Significance of the Study

In our collective and perceptual experience, we observe that minimal attention has been paid in IDT, as we connect with it in the US, to the topics of diversity, equity, and inclusion (DEI), and/or how DEI dimensions intersect with IDT research. While several scholars have addressed DEI practices in relation to the Association for Educational Communications and Technology (AECT) code of ethics (Sherry et al., 2003; Lin, 2007; Yeaman, 2004) as well as cultural questions affecting underrepresented groups (Thomas et al., 2002; Young, 2008), the question remains: While there are voices discussing the intersection of DEI and the research scholars conduct in IDT, are these issues attended to in the conception and conduct of our intervention studies? We have begun searching for the answer to this question by examining the evidence available in published studies in the field through AECT journals.

A number of design disciplines have focused on DEI dimensions for several years. For example, since the early 1980s, Victor Papanek has addressed the ethics and the morality of design companies to combat the idea of unsafe and useless products released to the market (Papanek, 1985). More recently, in the human-computer interaction design discipline, Batya Friedman and David Hendry have pondered the question of designs' impact on human life and proposed the notion of value-sensitive design (Friedman & Hendry, 2019). Those scholars have not, however, questioned the practice of design disciplines from an ethical lens per se, as much as examined DEI dimensions and how design actually impacts people in different ways.

In the IDT field, research frequently provides implications for both future scholarly work and for practice. Implications for practice often include certain recommendations or considerations for designing learning experiences that will inevitably apply to a diverse group of learners, whether or not there were limitations in the work contradicting such application. We know that each learner brings their unique background and experiences into the learning space. Therefore, ignoring learners' uniqueness along dimensions of diversity, equity, and inclusion during the design and implementation process may result in missed learning opportunities and a negative impact on learners (Lachheb et al., 2021). As such, we believe that if IDT research in a large segment of the field, as represented in AECT journals, leaves out this dimension as a basic consideration, a negative impact accrues to the discipline overall. We embarked on this study with the hope of finding explicit and implicit evidence that considerations around power and positionality are manifested to some extent in the IDT research we chose to examine. We hoped, should we find little such evidence, that the effort to do so may suggest better ways to represent in published studies efforts which *are* occurring. At a minimum, we hope to demonstrate a method by which we, as scholars, could interrogate our methods in order to increase the attention being paid to power and positionality in IDT research.

Methods

We followed a systematic method for selecting empirical studies and analyzing them by means of our research questions. With the time and resources available, we selected four (4) AECT journals from which to draw due to their impact, reputation, and connection with a well-known professional organization that makes efforts to include a diverse and international membership:

1. *Educational Technology Research and Development (ETR&D)*
2. *TechTrends*
3. *Journal of Computing in Higher Education (JCHE)*
4. *The Journal of Applied Instructional Design (JAID)*

Using the websites of each journal, we applied a 2015–2020 publication date filter and reviewed each volume/issue that fell within that time frame (see Table 1 for a

Table 1 Summary of Journals/Studies reviewed for analysis

Journal	# Volumes/ Issues	# Articles published	# Articles selected for the study
Educational Technology Research and Development (ETR&D)	6 Volumes (63–68) 36 Issues	477	211
TechTrends	6 Volumes (59–64) 36 Issues	632	115
Journal of Computing in Higher Education (JCHE)	6 Volumes (27–32) 18 Issues	156	40
The Journal of Applied Instructional Design (JAID)	5 Volumes (5–9)[a] 8 Issues	56	17
TOTAL	**23 Volumes 98 Issues**	**1321**	**383 (29% of studies reviewed)**

[a]JAID did not publish a Volume/Issue in 2016. This number includes all studies selected that were published between 2015 and 2020

summary of the number of volumes/issues we reviewed from each journal, along with the number of studies published and selected for analysis).

We identified and selected studies that are empirical investigations in which a learning/educational intervention and/or a treatment was implemented, and generalized conclusions were drawn. We did not exclude studies that followed any specific study design. As such, we selected studies that followed either design-based research (DBR), case study, experimental or quasi-experimental research designs. We excluded studies that described a phenomenon in situ (e.g., observational studies that observe how teachers implement a certain teaching practice without a known/clear intervention/treatment), studies that surveyed educations stakeholders about their perspective/experience with a certain phenomenon (e.g., a survey of parents/teachers/students/school administrators/design professionals about a topic without a known/clear intervention/treatment), literature reviews, conceptual/theoretical/position papers, or editors columns/introductions.

Among ourselves we each self-assigned a specific journal and a year to identify studies that met our selection criteria. Once one of us identified a study suitable for analysis, we entered it in a specific spreadsheet and closely read the paper to answer the following guiding questions (each with a possible "Yes/No and where?" conclusion):

- Is there an explicit bracketing OR positionality statement?
- Is there an implicit bracketing OR positionality statement?
- Is there an explicit discussion of power relationship(s)?
- Is there an implicit indication of power relationship(s)?
- Have disparities of privilege been addressed explicitly?

- Have disparities of privilege been addressed implicitly?
- Have other disparities been addressed implicitly or explicitly?

We held regular meetings at which we addressed any questions we had, such as whether a specific study met our selection criteria or not. We also discussed in detail what bracketing and positionality statements were and how to identify whether they were explicit or implicit. Based on our discussions, we created a coding book (see Appendix A) in order to ensure the clarity and consistency of our answers to the above guiding questions.

We have reviewed 1321 and selected/analyzed 383 studies as detailed in Table 1. Our findings from this analysis have been derived through a close review of the excerpts logged in a spreadsheet, with particular attention to how many have been identified, how many relevant statements were explicit or implicit, wherein the studies they appeared, and how they were distributed across journals (see Table 2).

Findings

Our findings are repeatedly characterized as "discernible but weak." By this, we mean that we found more implicit than explicit evidence overall. However, because we took the position in our analysis that we would acknowledge the distinction between conducting research and reporting on it, more attention may be paid to power and positionality during the conduct of research than may be considered critical to report in journal articles.

In the studies we analyzed, we found weak but discernible evidence that the power and positionality of researchers have been considered. Interestingly, we noted that bracketing and positionality statements appeared more often in qualitative studies, and in the Introduction or Discussion sections. Out of 383 studies, we found only nine (9) in which explicit bracketing or positionality statements appeared and 80 studies including implicit statements of bracketing and positionality. For example, we identified an explicit bracketing statement in Rizzuto (2017) who stated:

> My role as the researcher may have influenced data collection and analysis because ***I was the developer*** of the self-paced online course. I enhanced the reflexivity of the study and ***clarified my biases, attitudes, and beliefs, toward online learning and faculty development, by keeping a researcher journal*** […] Consulting with other faculty developers during data coding and analysis helped me ***to further bracket myself*** and maintain an objective analysis of the data (pp. 81–82). [emphasis added]

An example of an implicit bracketing statement is from Borge et al. (2020):

> ***We take a pragmatic approach*** to educational design that draws on theories and methods as a means to solve problems that interfere with desired learning outcomes. In the current work, we tackle problems associated with the development of communities of learners by incorporating a discussion-based social networking tool into a project-based course (p. 1090). [emphasis added]

Table 2 Summary of findings

Journal	Bracketing/positionality		Power relationship		Disparities of Privilege		Other disparities mentioned	
	Explicit discussion	Implicit mention	Explicit discussion	Implicit mention	Explicit discussion	Implicit mention	Explicit discussion OR Implicit mention	No discussion/ mention
Educational Technology Research and Development (ETR&D) n = 211	1	56	4	47	7	26	64	147
TechTrends n = 115	5	15	7	19	5	11	19	96
Journal of Computing in Higher Education (JCHE) n = 40	3	6	6	10	3	3	6	34
The Journal of Applied Instructional Design (JAID) n = 17	0	3	1	4	2	1	4	13
TOTAL	**9**	**80**	**18**	**80**	**17**	**41**	**93**	**290**

We qualify this statement as implicit bracketing because authors identify themselves with an aspect of the research, design iterations, through expressing their overall philosophy of educational design, providing insights to the reader as to their design decisions described in this design-based research. It is an implicit statement because the authors did not explicitly state why they follow a pragmatic approach or why it is important to account for social-cultural factors as part of the design.

Similarly, in these studies, we found weak but discernible evidence that power relations had been considered in carrying out the research process and in arriving at research conclusions. Out of the 383 studies we reviewed/analyzed, we found only 18 studies that explicitly included a discussion of power relationships, and 80 studies that included implicit statements in relation to power dynamics and relationships. For example, the following is an explicit power relationships statement from Mirriahi et al. (2016) who stated: "[…] ***the researchers lacked any control over the behaviors of the students*** and instead investigated learning and engagement within the natural context of the course" (p. 1088). [emphasis added] As an example of an implicit power relationships statement, Dwyer et al. (2017) stated:

> While it can be argued that one limitation of the current study ***was the exemplification of CT dispositions prior to the IM sessions may have primed or biased participant responding***, given the relative abstraction and novelty of CT and its related dispositions to some participants [...], it was necessary to provide examples of dispositions (based on a literature review) in order to ensure both clarity of the ideas generated and consistency with respect to ideas referring to inclinations, motivations and willingness (p. 69). [emphasis added]

Additionally, in the studies we reviewed/analyzed, we found weak but discernible evidence that disparities of privilege had been considered in carrying out the research process and in coming up with research conclusions. Most commonly, we found such statements in the Limitation section. Quantitative studies mostly reported limitations regarding statistics, such as a small sample size which affected power analysis or generalizability of the study. In some cases, authors implicitly noted specific characteristics of learners, such as their unique learning context or socio-economic characteristics. Out of the 383 studies, only 17 studies explicitly included a discussion of disparities of privilege, and 41 studies included implicit statements in relation to disparities of privilege. For example, Huang et al. (2017) made the following explicit statement in regard to disparity of privilege:

> According to the eighth-grade science teachers, the classes in ***the two groups were equivalent in academic levels and background in science and technology***; the students generally had not been exposed to any science inquiry experiences in the past (p. 81). [emphasis added]

As an example of an implicit statement of disparities of privilege, Ye et al. (2015) stated: "Results also suggested that there were ***contextual differences between school districts*** that affected teachers' use of the CCS" (p. 375). [emphasis added] In addition, Chen (2020) stated: "Moreover, all participants were already familiar with context-aware mobile learning" (p. 3067). From this last statement, we can infer that previous exposure to mobile learning and technologies is important, thus,

prior student exposure could affect study results. Grund and Tulis (2020) also acknowledged that access to technology and affordances to use technology could be a factor in the study:

> Another, more general limitation of our study is, that it ***has been performed in two techno-economical fields of study with technology-savvy students who probably appreciate using ARS***. Therefore, the generalizability of findings may be limited to this domain and they may not be true for all students (p. 988). [emphasis added]

Lee and Choi (2020) specifically noted that the digital divide was an important factor to consider when conducting their study: "One of the main concerns with this intervention in ***this rural area of Tanzania was students' unfamiliarity with digital devices and software***" (p. 3580). [emphasis added]

When we looked for discernible evidence in the studies we reviewed/analyzed in regard to other disparities that go beyond privilege, we counted 93 studies that either included an explicit discussion or an implicit mention of other disparities, and 290 studies that did not include a mention of other disparities. For example, Ong and Tasir (2015) implicitly acknowledged gender, learning, and socio-cultural disparities that could affect the study findings:

> In this study, ***factors that could affect trainees' learning, such as difference in age, gender, levels of expertise, learning styles, and socio-cultural background, were not taken into account*** as learning techniques were set as the scope in determining trainees' performance (p. 506). [emphasis added]

Discussion

First, by using a broad definition of bracketing statements, we found statements that are comparatively neutral, not fully explicit, and not explicit toward bias. In our perspective, an explicit bracketing and positionality statement (n = 9) has to speak to the following dimensions: (1) Why a scholar cares about the topic of their study from a scholarly and personal perspective; (2) What is the scholar's research perspective and what do they think scholars should focus on (i.e., what are they biased to); (3) What are the limits of the scholar's perspective (i.e., an acknowledgment of opposite views/perspectives that make the scholars as not the sole "owner of truth"). That being said, we think that an implicit bracketing and positionality statement (n = 80) addresses the aforementioned dimensions indirectly, perhaps with some hedging through the use of neutral/objective-like language.

Second, while our analysis was not aimed at finding a certain pattern, we found that positionality statements either appear in the introduction and/or in the discussion sections of the manuscripts. We think this use pattern may signal how some researchers are considering these statements in framing, while others do so in interpreting their studies. As for statements about power and privilege, we noted that they either appear in the discussion and/or in the limitation sections of the manuscripts.

Neither of these observations suggests a widely accepted norm in the field for placement of such statements, as there is for a number of other elements in research articles.

Third, the evidence found in our analysis of studies (n = 383) suggests, to a concerning degree, that research studies in these journals either do not include DEI dimensions as a basic consideration or do not include them in reports of research. We cannot be certain whether the researchers/authors have actually thought about DEI dimensions while carrying out their studies and writing their papers. However, based on our findings, we can argue that these dimensions are not showing up in our IDT publications as the studies are written.

As researchers who have published in, reviewed for, and edited such journals ourselves, we are aware that the baseline criteria given to authors and reviewers do not require that these dimensions be addressed. We are also sensitive to the fact that AECT journals have strict editorial requirements, especially word counts, which may lead authors to sacrifice explicit or implicit discussions of power, privilege, and their own positionality. Also, we acknowledge that positionality can be unsafe for some authors and therefore should not be prescriptively suggested. These may be some reasons why the studies we have reviewed mention them as infrequently and indirectly as they do.

Another reason may be implicit and explicit norms of academic writing that prioritize an objective tone in writing through using a passive voice. In fact, we noticed that quantitative studies were written from a positivist view. This entailed portraying the roles of the researchers and the researched as mutually exclusive, and adopting an impersonal approach to research—we found no introspection between the researchers and study participants in these studies. As such, we often read "students were given a…" or "teachers were asked to…" or "a unit was designed to…" Whether it is meant or not, this tone suggests that the responsibility of designing interventions/treatments in IDT research, including responsibility for issues of power and positionality, is outsourced to some other powers residing outside of the researcher/author. While authors do make decisions about the tone they use in writing, the pressure and, for many, automaticity of cultural norms for reporting research cannot be discounted. This observation is more noticeable in the ETR&D journal where we found an emphasis on large-scale quantitative studies. Thus, we noticed a disparity between journals that we analyzed in terms of types of studies and their overall perceived impact. Additionally, we have found few studies where the researchers/authors use first-person pronouns to make knowledge claims. In fact, we noticed that recent studies—published between 2018 and 2020—began to include a more active tone in writing and included clearer positionality statements compared to studies published between 2015 and 2017. Last, although it was not part of our analysis method, we observed an absence of the use of critical theories in studies, despite the focus of such studies on human aspects.

We cannot avoid the possibility, even probability, that many studies are not designed or carried out with much, if any, attention to issues of power and

positionality and that this is the reason those issues are appearing infrequently in representations of the studies. While our study focuses on a subset of journals in the world, albeit ones in which some authors and studies from around the world do appear, within this subset we would expect to see more, and more explicit, signs that the authors – if not the journals themselves – were committed to equity as a core value should that be so.

Limitations of the Study

Apart from those included in this study, there are many other IDT journals that publish empirical investigations with an intervention/treatment implemented. Our collective assessment was that the AECT journals we selected are some of the best known and that they represent several perspectives in terms of focus (research, theory to practice, technology, and design practice) while including a manageable number of studies to be reviewed. We acknowledge, however, that a fuller understanding pertinent to the issues we are studying could be achieved with a review of more journals.

Implications, Conclusion, and Future Research

The possibilities we have discussed cannot be separated from larger societal systems of racism, inequality, oppression, colonialism, which in too many contexts have been ignored or sidelined as marginal, or special interest, concerns. Journalistic criteria and the norms for representing research do not arise and are not perpetuated in a vacuum. Both intentional forces and those originating in ignorance are required to sustain them, and required to change them. Our study goal has been a descriptive and exploratory one. We are not advocating for, nor are we prescribing, specific paragraphs to be included in all manuscripts, which would be premature and probably inadequate as a practice. However, considering that researchers in IDT are at the center of important human challenges, of which social justice, inclusion, and inequities are critical, and without which learners cannot expand their opportunities to learn and bridge their achievement gaps, if we do not recognize a problem we cannot address it. And if we do not find ways to address critical dimensions of the human experience which can impinge negatively on teaching and learning, we are not fulfilling the promise of our research efforts.

Appendix A: Coding Book

Code/Question	Operational Definitions
Is there an explicit bracketing OR positionality statement? (YES/NO and where?)	We have identified two forms here: • **Bracketing**, in which the authors state their assumptions relevant to the study and sometimes also the reason for these assumptions. This is ***not the same*** as an impersonal statement of hypothesis—"*we anticipate that the students in condition x will perform better on tasks than those in condition y*" or even "we selected students randomly for the groups to minimize the effect of differences between them." Explicit bracketing might look like this: *"The researchers anticipated that these teachers would be nervous implementing our design because we did not expect that most of them would have strong backgrounds in STEM."* • **Positionality**, in which authors identify their relationship to one or more aspects of the research which will offer readers perspective on, or insight into, how the authors frame the study, choose or employ method, analyze data or draw conclusions. Explicit positionality might include: *"As a woman who attended a private school, I recognize that my experiences will have been different than those of these 4th graders, most of them African-American or Latinx students who receive free and reduced lunch at school; therefore my insight into their explanations for participating or not participating in the after-school intervention will be incomplete."*
Is there an implicit bracketing OR positionality statement? (YES/NO and where?)	Here the bracketing or positionality statements ***are only indirect***; the authors allude to expectations and/or their own identities without elaborating, or signaling the implications of those statements. For example: *"Half the students did not check the leaderboard in the gamified version of the lesson, which was a little surprising. But they did reference their standing in the game occasionally after the lesson ended."* **OR** *"At the beginning of the lesson, the teacher handed out one pencil per student who did not have one of their own, then at the conclusion of the lesson retrieved and stored them. This took time that we had not planned into the intervention period."* **Remember:** we are not trying to say that a statement like this *should have been* explicit. We are looking for evidence that these considerations are being made and how they are being made.

Code/Question	Operational Definitions
Is there an explicit discussion of power relationship(s)? (YES/NO and where?)	While there are always power relationships in research and in the situations being studied (and as readers we may be able to spot them), we are looking for direct statements by the authors that they have recognized one or more power relationships and considered them as relevant to the research. Explicit statements might be something like: *"Care was taken while introducing the intervention to ensure that the course instructor would not know which students elected to participate; this was to minimize the chance that students would assume that participation was tied to their course grade."* Or, *"Prior to starting the intervention the researchers conducted a workshop for teachers covering the physics concepts in the lesson; we wanted to ensure that the guest instructors, who were university physicists, would not dominate in the classroom during the lessons."* Or, *"Half the participants in the after-school program are over 12 years old; after the initial orientation, they were grouped into a second room together for the duration of the learning game so they would not set a pace that the younger participants could not match."*
Is there an implicit indication of power relationship(s)? (YES/NO and where?)	Implicit statements of power relationships will show that there is some recognition of power as an element in the study, but will not describe it or explain it specifically. Example: *"Students were divided into mixed-ability groups, and one from each group was selected by the teacher to lead the group."* Or: *"The researchers assessed the readiness of the instructors to implement this intervention; those determined to need a co-teacher were assigned one from the research team."*

Appendix A: *Continued*

Code/Question	Operational Definitions
Have disparities of privilege been addressed explicitly? (YES/NO and where?)	Disparities of privilege refer to social, cultural, financial, or historical privilege between participants in the study, researcher and/or designers conducting the study, and those participating in it, OR disparities between those involved in the study and the populations to which findings might be applied. Disparities are not the same as differences— a difference may be neutral, but a disparity as we are using the term will be or could result in, an inequality. Explicit statements could include something like: *"This study involved learners in a private program for children assessed as 'gifted,' who might be assumed to have extensive preparation for success in independent learning and to bring supporting skills to the experience."* Also, "The teachers recruited into the study were from rural villages in the interior of the country. As researchers, we recognize that their participation with our intervention was informed by prior experiences with NGO interventions which offered them little opportunity to contribute from their own experiences." Or could be something short like: *"80% of the students in this district receive free or reduced lunch ..."* This does not say specifically how privilege factors into the study, but does acknowledge it explicitly by giving a specific indicator of the low socio-economic status of the students.
Have disparities of privilege been addressed implicitly? (YES/NO and where?)	We are looking for the same type of disparities as in explicit statements but mentioned by the authors of the study indirectly. They are "pointing to" a privilege (or lack of privilege) but not calling it such. Authors might say: *"Some students were academically less prepared for the complex tasks than others ..."* Or, *"Some second-language speakers in the classroom waited longer than their peers to contribute to the discussion."*
Have other disparities been addressed implicitly or explicitly? (YES/NO and where?)	Authors may discuss disparities that they do not appear to address through an ethical lens—*although we may recognize that any of them could be addressed as such*: •The difference in talent (e.g., music, art, athletics) •Demographics like GPA, religion, a major area of study, etc. •Psychological profiles like field dependent or independent, level of self-efficacy, etc.

References

Bohman, J. (2003). Critical theory as practical knowledge: Participants, observers, and critics. In P. S. Stephen & P. A. Roth (Eds.), *The Blackwell guide to the philosophy of the social sciences* (pp. 91–109). Wiley. https://doi.org/10.1002/9780470756485.ch4

Borge, M., Ong, Y. S., & Goggins, S. (2020). A sociocultural approach to using social networking sites as learning tools. *Educational Technology Research and Development, 68*(3), 1089–1120. https://doi.org/10.1007/s11423-019-09721-z

Chen, C. H. (2020). Impacts of augmented reality and a digital game on students' science learning with reflection prompts in multimedia learning. *Educational Technology Research and Development, 68*(6), 3057–3076. https://doi.org/10.1007/s11423-020-09834-w

Creswell, J., & Poth, C. (2018). *Five qualitative approaches to inquiry: Choosing among five approaches*. SAGE.

Dwyer, C. P., Hogan, M. J., Harney, O. M., & Kavanagh, C. (2017). Facilitating a student-educator conceptual model of dispositions towards critical thinking through interactive management. *Educational Technology Research and Development, 65*, 47–73. https://doi.org/10.1007/s11423-016-9460-7

de Alvarez, M. S., & Dickson-Deane, C. (2018). Avoiding educational technology pitfalls for inclusion and equity. *TechTrends, 62*(4), 345–353. https://doi.org/10.1007/s11528-018-0270-0

Friedman, B., & Hendry, D. G. (2019). Value sensitive design: Shaping technology with moral imagination. *MIT Press*. https://doi.org/10.7551/mitpress/7585.001.0001

Grund, C. K., & Tulis, M. (2020). Facilitating student autonomy in large-scale lectures with audience response systems. *Educational Technology Research and Development, 68*(3), 975–993. https://doi.org/10.1007/s11423-019-09713-z

Gyabak, K. (2020). WASH by design: A design case on the collaborative curriculum project for elementary schools in Rural Papua New Guinea. In M. J. Bishop, E. Boling, J. Elen, & V. Svihla (Eds.), *Handbook of research in educational communications and technology* (pp. 647–659). Springer. https://doi.org/10.1007/978-3-030-36119-8_29

Habermas, J., McCarthy, T., & McCarthy, T. (1984). *The theory of communicative action* (Vol. 1, p. 308). Beacon Press.

Howard, C. D., & Das, A. (2019). Designing competitive discussions for equity and inclusion. *International Journal of Designs for Learning, 10*(1), 1–13. https://doi.org/10.14434/ijdl.v10i1.24670

Huang, K., Ge, X., & Eseryel, D. (2017). Metaconceptually-enhanced simulation-based inquiry: effects on eighth grade students' conceptual change and science epistemic beliefs. *Educational Technology Research and Development, 65*, 75–100. https://doi.org/10.1007/s11423-016-9462-5

Lachheb, A., Abramenka-Lachheb, V., & Huber, L. (2021). Challenges and opportunities in adhering to UDL principles to design online courses. *The Journal of Applied Instructional Design, 10*(1). https://doi.org/10.51869/101alvallh

Lee, H. K., & Choi, A. (2020). Enhancing early numeracy skills with a tablet-based math game intervention: a study in Tanzania. *Educational Technology Research and Development, 68*(6), 3567–3585. https://doi.org/10.1007/s11423-020-09808-y

Lin, H. (2007). The ethics of instructional technology: Issues and coping strategies experienced by professional technologists in design and training situations in higher education. *Educational Technology Research and Development, 55*(5), 411–437. https://doi.org/10.1007/s11423-006-9029-y

Mao, L., Mian Akram, A., Chovanec, D., & Underwood, M. L. (2016). Embracing the spiral: Researcher reflexivity in diverse critical methodologies. *International Journal of Qualitative Methods, 15*(1). https://doi.org/10.1177/1609406916681005

Mirriahi, N., Liaqat, D., Dawson, S., & Gasevic, D. (2016). Uncovering student learning profiles with a video annotation tool: Reflective learning with and without instructional

norms. *Educational Technology Research and Development, 64*(6), 1083–1106. https://doi.org/10.1007/s11423-016-9449-2

Monteiro, M. (2019). *Ruined by design: How designers destroyed the world, and what we can do to fix it*. Mule Design.

Moore, J. L., Dickson-Deane, C., & Liu, M. Z. (2014). Designing CMS courses from a pedagogical usability perspective. In Whitworth & D. A. Benson (Eds.), *Perspectives in instructional technology and distance education: Research on course management systems in higher education* (pp. 143–169). Information Science Reference.

Nelson, H. G., & Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world*. MIT Press.

Ong, C. P., & Tasir, Z. (2015). Self-instructional module based on cognitive load theory: A study on information retention among trainee teachers. *Educational Technology Research and Development, 63*(4), 499–515. https://doi.org/10.1007/s11423-015-9383-8

Papanek, V. J. (1985). *Design for the real world: Human ecology and social change*. Academy.

Payne, Y. A., & Hamdi, H. A. (2009). "Street love": How street life oriented US born African men frame giving back to one another and the local community. *The Urban Review, 41*(1), 29–46. https://doi.org/10.1007/s11256-008-0098-6

Rizzuto, M. (2017). Design recommendations for self-paced online faculty development courses. *TechTrends, 61*, 77–86. https://doi.org/10.1007/s11528-016-0130-8

Sherry, A., Burniske, R. W., de Fretas, C. M. V., de Rabago, S. J. D., Johari, A., Chu, C., & Marchessou, F. (2003). Tradutore, traditore: Can the aect code of ethics "speak" across cultures? *TechTrends, 47*(6), 19–25. https://doi.org/10.1007/BF02763280

Solórzano, D. G., & Yosso, T. J. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry, 8*(1), 23–44. https://doi.org/10.1177/107780040200800103

Stefaniak, J., Shah, S., Mills, E., & Luo, T. (2020). Keeping the learner at the focal point: The use of needs assessment and persona construction to develop an instructional resource center for instructional designers. *International Journal of Designs for Learning, 11*(2), 142–155. https://doi.org/10.14434/ijdl.v11i2.25632

Subramony, D. P. (2004). Instructional technologists' inattention to issues of cultural diversity among learners. *Educational Technology*, 19–24. https://www.jstor.org/stable/44428919

Subramony, D. P. (2016). Revisiting instructional technologists' inattention to issues of cultural diversity among learners. In R. Joseph & J. L. Moore (Eds.), *Culture, learning and technology: Research and practice* (pp. 19–24). Routledge.

Subramony, D. P. (2018). Not in our journals: Digital media technologies and the LGBTQI community. *TechTrends, 62*(4), 354–363. https://doi.org/10.1007/s11528-018-0266-9

Thomas, M., Mitchell, M., & Joseph, R. (2002). The third dimension of ADDIE: A cultural embrace. *TechTrends, 46*(2), 40–45. https://doi.org/10.1007/BF02772075

Tracey, M. W., & Unger, K. L. (2010). Cross cultural instruction: An instructional design case. *International Journal of Designs for Learning, 1*(1). https://doi.org/10.14434/ijdl.v1i1.845

Ye, L., Recker, M., Walker, A., et al. (2015). Expanding approaches for understanding impact: integrating technology, curriculum, and open educational resources in science education. *Educational Technology Research and Development, 63*, 355–380. https://doi.org/10.1007/s11423-015-9377-6

Yeaman, A. R. (2004). Professional ethics professional ethics for technology. *TechTrends, 48*(2), 11–15. https://doi.org/10.1007/BF02762537

Young, P. A. (2008). The culture based model: Constructing a model of culture. *Journal of Educational Technology & Society, 11*(2), 107–118. https://www.jstor.org/stable/10.2307/jeductechsoci.11.2.107

Forged in Fire: A Case Study of How the Class of COVID-19 Empowered Unheard Communities in the Fight for Social Justice

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Students in the Florida Focus TV news class at the University of South Florida create impactful solutions-based journalism stories that air Mondays through Fridays on Tampa's PBS station in one of America's largest media markets. During the spring 2021 semester, students were responsible for pitching news stories, writing scripts, interviewing people on camera, conducting research, and editing the stories into videos. The daily newscasts were published on YouTube, Facebook, Twitter, Instagram, and broadcast on local TV. The goal of the class is to air timely stories while providing the community with diverse perspectives that are often missing from mainstream media outlets. In addition to exposing social injustice, students were also tasked with shining a light on people who are working to fix these problems and empower viewers to become part of the solution. This course is designed to provide students with an environment that closely matches the expectations of a real-world TV newsroom. The instructor acts as the news director for the daily operations of the newscasts. The objective of the course is to prepare students for full-time employment in the TV news industry. After graduating, some students go on to become news producers, reporters, writers, anchors, videographers, and editors.

While it is important that journalists identify what communities are going through, it is equally important that educators address challenges our students are facing. COVID-19 provided us with a unique opportunity to support our students because the pandemic exacerbated systemic inequalities that our students have experienced for a long time. We were forced to come face-to-face with the realities of inaccessibility to technology, healthcare, housing, and basic human rights. The diverse racial and gender makeup of the students in this class added a sense of urgency to tackling society's problems. The pandemic made these problems even

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more personal, which made it the best time to empower students to do something about it.

In the first month of the semester, students went through a social justice boot camp. In response to the pandemic, the course that was once taught in a TV studio on the USF Tampa campus was transformed into a synchronous online course with extensive digital modules using a learning management system following Richard Mayer's Principles of Multimedia Learning. The first module was titled What You're Writing About and Why. It was broken up into pages that delved into how to report on different social issues like racism, sexism, wealth inequality, the prison industrial complex, mental health, and bigotry against people in the LGBTQ+ community. Each module page contained a combination of infographics, statistics, podcasts, TV shows, and documentaries to arm students with the knowledge many said they lacked coming into the class. Students learned about journalists' responsibility to fairly and accurately represent their communities.

Following in-depth reflections and group discussions surrounding social justice issues, students then learned how to use multimedia and storytelling tools to share what they learned with the world. Students were taught that it is their responsibility to create content that engages audiences while educating the community about solutions to these problems.

Some of the students chose to cover stories about hate crimes against Asian Americans as a result of racist rhetoric around the coronavirus. One student featured a digital equity initiative that is helping underserved students get access to laptops and the internet. One student celebrated a developmentally disabled baker who created her own company after losing her job because of the pandemic. One student interviewed a Black barber who gives free haircuts and books to children of color. In the wake of the Crown Act to ban hair discrimination, another student interviewed anchors and reporters about their fight to wear natural hair on TV. Two students traveled to the spot where Trayvon Martin was killed on the anniversary of the teen's death to produce a video about how it helped give birth to the Black Lives Matter movement.

While it is crucial that all journalists are capable of accurately telling stories about people from different backgrounds, there is no denying that representation in newsrooms also matters. A Radio Television Digital News Association survey of local TV news diversity published in 2020 found that people of color make up just 26.6% of the American TV news workforce (RTDNA, 2020). This lack of representation inside newsrooms is considered one of the reasons that American TV news stories fail to represent their communities.

The aim of this study was to evaluate whether this social justice instruction and focus on intentionality resulted in students creating more equitable and inclusive media. The study sought to get feedback from students about their perception of comprehension and retention as it is related to diverse news content creation. The study also aimed to better understand how students felt about broadcasting social justice issues they were personally affected by. It also attempted to get a snapshot of whether students felt adequately informed on social justice issues prior to

participating in the class and whether they felt changes need to be made to K-12 and university instruction surrounding these issues.

Theoretical Framework

Students were taught to intentionally conduct interviews with diverse people whose stories are too often unheard. Historically, newsrooms predominantly hired white men, which transferred to news coverage that focused largely on people who looked and sounded like those journalists. The goal of this class was to end this cycle and instead aim to more accurately represent the communities we serve. Social identity theory (how individuals use their concepts of the self to identify with other groups and make sense of the world) posits that how we view ourselves is "largely relational and comparative," (Tajfel & Turner, 1986, p. 16). Social groups play an important role in the development of social identity, pride, and self-esteem. Social identity theory focuses on belonging. Thus, for students to see themselves as members and leaders of their communities, it was important to have culturally diverse media coverage whereby students could see themselves represented in the shows they created. According to social identity theory, if our student journalists are more diverse, then their stories should be too. Publishing inclusive TV news shows should help our students and viewers create a more open-minded, empathetic, and compassionate society.

The course was also designed with constructivist learning theory that is tied to the social aspect of cognitive development. Constructivism focuses on the learner's need to connect their own experiences to new knowledge. It recognizes the learner's place in the world and how students affect one another's understanding. For this reason, the course was designed with a considerable number of group discussion and collaborative projects about social justice issues (Coupal, 2004).

Methodology

This mixed-methods case study analyzed the content students created over the course of the 16-week semester. First, each student story was coded and timed. Stories were coded for their social justice themes with nominal level variables. Social justice stories were defined as being about "fair treatment of all people in a society, including respect for the rights of minorities and equitable distribution of resources among members of a community." Each story was also coded with a short description to find common qualitative themes. Stories that were coded as being about social justice included words like equality, inequality, justice, injustice, gender, racism, sexism, discrimination, Black, African American, Asian, white, Hispanic, low income, native, and poverty.

Because of a longstanding lack of diverse and female voices on American TV news, the analysis also looked at the racial and gender demographics of the interviewees featured in the newscasts. Interview subjects were coded as person of color or white, male, female, or non-binary.

Student racial and gender demographics were also noted as part of the study.

Upon obtaining IRB approval, students who had been enrolled in the course were asked to complete an optional survey about their experience and offer recommendations that educators could implement to improve social justice instruction in schools. The survey included a mixture of quantitative and qualitative questions such as how informed students felt concerning social justice before and after the semester and open-ended questions asking students to elaborate on how their work impacted their understanding of social justice issues (see Appendix).

Findings

In the spring 2021 semester, students in the Florida Focus class published 3 h and 35 min of video news stories, with approximately 33% (one third) of this total sample being devoted to stories centered on social justice and equity.

Common topics included racism in healthcare, policing, and employment. Wealth inequality was a major focus, as was the digital divide that disproportionately hurts low-income and rural communities, especially when the pandemic forced people to work and learn remotely. Several students told stories that explored wealth inequality as it relates to gender.

A Nielsen analysis of diverse representation on TV published at the end of 2020 found that women make up 52% of the American population but only have 38% of screen time (Nielsen, 2020a). In the Florida Focus class, 52% of interviews were with women. Thirty-six percent of interviews students conducted were with people of color. While Nielsen has reported that about 40% of the U.S. population is racially and ethnically diverse, they have also reported that people of color have less than 27% "share of screen" time on TV (Nielsen, 2020b).

Twenty-seven students created content for the Florida Focus show in spring 2021. Approximately 55.6% of students in the class were female, 40.7% were male, and 3.7% identified as non-binary. Roughly 55.6% of students were white and approximately 44.4% identified as people of color. The demographic makeup of the students in the class was diverse. Thus, this case study provides an innovative opportunity for research to investigate the ways in which social identity theory can be used to encourage underrepresented student populations to create and disseminate content that is more balanced, representative, and culturally diverse (Hogg, 2018; Tajfel & Turner, 1986).

Ten students completed the anonymous survey. Students rated their understanding of social justice issues as an average of 6.5/10 before they started the class and 9.1/10 at the end of the class.

When asked to reflect on the stories they chose to tell, several students wrote about systemic injustice. They acknowledged that the media industry is part of the problem but can be a powerful tool to help fight the systems that continue to profit off repressing marginalized communities. Several students mentioned that while systemic injustice hurts them and their families, they were shocked to uncover how big the need is for systemic reform.

One student wrote that reporting on stories during the pandemic gave them perspective and helped them better understand the country in which they live: "*When I'd interview Black people who said they were just as afraid of cops as they were COVID-19, it just gave everything a new meaning and myself a new outlook. Everyone had a lot to worry about, but certain groups more than others*."

This came in the midst of a pandemic that disproportionately killed people of color because of unequal access to healthcare (Garcia et al., 2020). It also came on the heels of a reinvigorated Black Lives Matter movement. Students were actively involved in community storytelling surrounded by public outrage over George Floyd and Breonna Taylor. Students expressed that they were deeply moved by the interactions they had with one another and members of their communities: "*I learned how minority groups are given the short end of the stick when it comes to mental health help and resources. I also talked to people who were personally affected by racism in the United States and how it affected their mental health in the pandemic*."

Students expressed feeling a stronger personal connection to the stories than they would have if they only read about social justice in a textbook, referred to as participatory or active learning (Domínguez, 2012). Such participation incorporates a level of interactivity that allows for mutual learning, where all parties involved see growth and benefit (Domínguez, 2012). Students reflected on the act of interviewing people and working with one another to develop these projects: "*I interviewed over ten people of different backgrounds relating to Black equality, opinion on social justice matters, police brutality, protesting, and representation. I've also conducted interviews with Native American activists regarding the same. It made everything much more personal. To see interviewees become emotional talking about their issues they've faced, it's very hard but helps you form much more empathy and understanding for them*."

A common takeaway was a better understanding of the need for representation as a solution to issues that plagued generations of Americans. Students appeared to connect the dots between America's history of slavery, the 13th Amendment, and our current prison industrial complex that is particularly extreme in the state of Florida where these students live: "*I interviewed several people about their interactions and history with the criminal justice system, and how it marked them for life, and how they were set up for failure. The experience made me more determined to tell stories of the disenfranchised and really LISTEN to members of our community about their struggles*."

The overwhelming sentiment in the survey revealed that interviewing people in their community led students to develop a stronger sense of moral responsibility to contribute to society: "*Before taking this class I wasn't sure what my responsibility*

as a journalist or a young adult was when it came to issues that didn't directly affect me. I have realized how wrong I was and that it takes many voices to move mountains."

One of those realizations came from a student who used the survey to reflect on their time covering the school to prison pipeline. The student interviewed young women of color who were disproportionately punished because of the intersectionality of their race and gender. The student highlighted an organization that helps these young women get through school and stay out of the criminal justice system. In the survey, the student expressed outrage that they had not learned about this systemic inequality prior to taking this course. The student expressed that they were deeply affected by what they learned creating this project. This student, along with many others echoed the position of one student who wrote, "*It made me feel a sense of duty to help and advocate for people from different backgrounds*."

Another student wrote, "*Everything became much more personalized and humanized. When you gain empathy for a group of people, you want to help them and fight for them*."

A common theme in student reflections about COVID-19 was that covering stories about social justice gave students perspective and a sense of purpose that helped them process their emotions and thoughts at a time when they too were struggling. Many wrote that it made them feel less alone: "*It was helpful because I realized everyone's going through their own personal struggles due to the pandemic*."

Another student wrote, "*It made me realize that although this pandemic is affecting everyone, minority groups are getting hit the hardest and no one was talking about it very much. Florida Focus taught me that, even if the mainstream media isn't discussing these things, we have to*."

Many students noted that they became more aware of misrepresentation in the media and now feel a duty to use their platform to help underserved communities share their stories.

When asked whether they felt that they were taught an adequate amount about social justice and equity before taking the class, most students said no. Many students wrote that their knowledge about these issues came mostly from social media, not school. One notable response to the survey highlights an approach educators can take to improve this: "*I feel as though before I was learning my responsibilities through social media and other people my age. The content in academia was very much … 'Here's a story, do it this exact way,' all just to check boxes for a passing grade. With this class I feel like stories came first, grades came last. The freedom we had to choose stories and characters was unlike any other class I had taken before, that's why I found it so valuable*."

Students also noted that arming them with statistics about social justice issues before they started their projects helped them approach their assignments with more confidence. Many students noted that previous educators did not present social injustice using statistics and one student wrote because of that, they were, "*blind to the fact that there is still so much injustice in our society today*."

When asked to explain the changes they feel should be made to the way schools teach social justice and equity, students agreed that it is important for teachers to

facilitate an environment where students are not afraid to talk about social injustice. Students noted that they would like to see much more social justice education in K-12 and university curriculum. One student wrote, "*Social justice and equity should be built into any courses where they have relevance, because there is so much importance and nuance to these issues that it should be touched on as much as possible, with as much detail as possible*."

They also recommended that educators incorporate more assignments where students meet with members of their communities. One student who created a video about an African American historic district wrote, "*I learned so much about their influence on the culture of St. Pete, and I would've never known if I hadn't gone there… These communities seemed as though they were left in the dust to fend for themselves, without any municipal help or awareness. Florida Focus brought me out of my comfort zone and into communities that needed a voice*."

The survey concluded by asking students to share any final thoughts they have about this issue. One student wrote, "*Representation is so important and I think there needs to be more of it. To gain empathy there first needs to be understanding. The ignorance and lack of cultural understanding needs to be fixed so communities can be bridged*."

Conclusion

This iterative and collective process of instruction allowed for the students to reflect on their shared processes of identity formation and deconstruction throughout the semester while giving voice to issues of social justice. Results of this case study suggest that the use of social identity theory as a pedagogical tool in demographically diverse student populations shows great promise in helping students to feel as though they are being represented in the media. In addition, it makes them feel empowered to positively impact the world by altering the media landscape by providing more diverse sources and raising awareness of important social issues through the act of participatory journalism.

Constructivist theory helped us foster a digital community during a time when emergency remote learning made so many students feel isolated. It empowered students and gave them the autonomy they felt they lacked in other areas of their lives. This theory acknowledges that every student comes to a class with their own life experiences, which include discrimination and implicit bias. Since new student learning is built on an existing foundation, it is crucial that educators acknowledge how that foundation was built and how we can work together to accomplish mutually beneficial goals that foster equity and inclusion in our communities.

If there ever was a time when social justice education was most dire, it is this seemingly never-ending pandemic year that exposed America's darkest truths to students who felt ill-equipped to process the pain around them. The coronavirus pandemic destroyed millions of lives and reversed social and financial progress for those who needed it the most. But it also positioned educators to illuminate the path

forward and seize this moment of anguish to inspire students to become part of the solution our country so badly needs. The pandemic undeniably exacerbated inequality. The poor became poorer. The wealthy grew richer. The disparities between men and women flourished as mothers were forced to sacrifice financial freedom for their families. Students watched as their family's businesses shuttered. They watched as protesters took to the streets. They watched communities of color vanish as the death toll climbed to heights that desensitized the nation. This is the perfect time to teach students that these inequalities did not happen by accident. These inequalities are a symptom of strategic design. And because of this, students have the power and responsibility to do something about it.

Appendix

Demographic Questions

1. Are you of Hispanic, Latino, or of Spanish origin?
2. How would you describe yourself?
   (a) American Indian or Alaska Native
   (b) Asian
   (c) Black or African American
   (d) Native Hawaiian or Pacific Islander
   (e) White
   (f) Latino
   (g) Hispanic
3. What gender do you identify with?
4. What is your age

Survey Questions

1. Before enrolling in the Florida Focus class at USF, how informed do you think you were on issues concerning social justice, equity and community? On scale from 1 to 10, 1 being not informed at all, 10 being extremely informed.
2. After taking the Florida Focus class, how informed do you now feel on issues concerning social justice, equity and community? On scale from 1 to 10, 1 being not informed at all, 10 being extremely informed.
3. Please describe the stories and or visuals you worked on in this class and how they related to social justice, equity and community.
4. Did you conduct at least one interview for this class that related to social justice, equity and/or community? If yes, please explain what the interview/s were about and how they affected your experience in the course.

5. How did your work on these stories impact your understanding of social justice, equity and/or community?
6. How did telling stories about social justice affect your ability to process your thoughts and emotions about the pandemic?
7. Please reflect on and share how your view of social justice issues changed because of this class and why.
8. Please explain if you feel that you were taught an adequate amount about social justice, equity and community before taking this class.
9. Please explain the changes, if any, you feel should be made to the way schools teach social justice, equity and communities.
10. Please feel free to share any other thoughts you have about social justice, equity and community as it relates to education.

References

Coupal, L. V. (2004). Constructivist learning theory and human capital theory: Shifting political and educational frameworks for teachers' ICT professional development. *British Journal of Educational Technology, 35*(5), 587–596. https://doi.org/10.1111/j.0007-1013.2004.00415.x

Domínguez, R. G. (2012). Participatory learning. In N. M. Seel (Ed.), *Encyclopedia of the sciences of learning*. Springer. https://doi.org/10.1007/978-1-4419-1428-6_1903

Garcia, M. A., Homan, P. A., García, C., & Brown, T. H. (2020). The color of Covid-19: Structural racism and the disproportionate impact of the pandemic on older black and Latinx adults. *The Journals of Gerontology: Series B, 76*(3), e75–e80. https://doi.org/10.1093/geronb/gbaa114

Hogg, M. A. (2018). Social identity theory. In P. J. Burke (Ed.), *Contemporary social psychological theories* (2nd ed., pp. 112–139). Stanford University Press.

Nielsen. (2020a). *Shattering stereotypes: How today's women over 50 are redefining what's possible on-screen, at work and at home.* Retrieved from https://www.nielsen.com/us/en/about-us/diversity-and-inclusion/inclusion-analytics/

Nielsen. (2020b). *Being seen on screen: Diverse representation and inclusion on TV.* Retrieved from https://www.nielsen.com/us/en/insights/report/2020/being-seen-on-screen-diverse-representation-and-inclusion-on-tv/

RTDNA. (2020, September 9). *People of color in TV news.* Retrieved from https://www.rtdna.org/article/2020_research_newsroom_diversity

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup relations. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations* (2nd ed., pp. 7–24). Nelson Hall.

How Could an Instructional Design Promote Social Justice and Equity in Learning Communities? A Holistic View from Bloom's Taxonomy, Maslow's Hierarchy, and Quality Assurance Perspectives

Nazire Burcin Hamutoglu

The question whether an inclusive instructional design can be considered a panacea in ensuring social justice and minimizing inequality is investigated with different perspectives (Rao, 2021; Van Wingerden, 2021). Rao (2021) expresses that Universal Design for Learning (UDL) is a framework to guide the development of inclusive learning environments based on three principles: representation, action and expression, and engagement. Each principle offers multiple ways to design inclusive learning, and together they provide a framework to make instructional design decisions with a focus on learner inclusion. The UDL design cycle gives teachers a way to intentionally and systematically design for all learners. Social justice and inclusion values, one of the key pillars of UDL, emphasizes that the curriculum should be proactively developed with flexible and engaging options open to all learners. Folger et al. (1995) underlines three faces of social justice: equity, equality, and need. Accordingly, online learning environments *(e.g. Learning Management Systems-LMS)* have an undeniable role in responding to the dynamics of an inclusive instructional design. The opportunities for learning offered by the internet are equalizing to those who have access. Online tools have the power to make learning environments inclusive. According to Van Wingerden (2021), although LMS have been a common form of educational technology in international universities for a while, consistency in how they are used and in what capacity varies widely by individual faculty and instructors, not necessarily by institution, and it is important to carefully consider the LMS as a place and its inclusivity in the student experience, environmental factors, and design and delivery of the LMS. In his/her work, it is also emphasized that LMS are increasingly at the forefront of public universities,

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catering to the needs of students with multiple and cross-cutting identities and a diversity of needs and accommodations. Rose et al. (2005) considered the needs of students at the extreme points of our education system.

The UDL framework creates an inclusive learning environment and evaluating its three principles can draw attention to social justice factors. Using the three principles of providing multiple means of representation, action and expression, and engagement as a guide to evaluation may identify deficiencies in all areas of learning and in the broader field of education. One of the main pillars of UDL asserts that the curriculum, rather than the learner, needs to change. It highlights the power of digital media as a flexible curriculum development tool that can support the diverse needs, abilities, and interests of students in the classroom. This issue could be taken into account comprehensively by focusing on the outcomes of the Covid 19 global pandemic, which may affect ongoing developments in the field of education. This influence is visible at almost every stage of activities. To draw attention to this issue, Van Wingerden (2021) has developed curriculum design and pedagogy models for the LMS called "Creating Inclusive Ideals: Pedagogy & Design Model" as well as activities and LMS design features that instructors can use to increase the welcoming, approachability, accessibility, and equity of the LMS for students in higher education.

Emergency distance education has proved that learning tools lack true equality and justice. As it is reported by the World Health Organization (WHO), globally, there have been 136 M confirmed cases of Covid-19, including around 3 M deaths, while a total of 732 M vaccine doses have been administered, as of 12 April 2021 (WHO, 2021). Of course, statistics do not show that people die because they cannot receive education. Still, these statistics alert us that there is a global emergency triggering the need for an inclusive learning design to extend beyond the pandemic in online learning environments and traditional education. The alarm related to social justice and equity sounds louder than usual, especially considering what educators and the general public have learned about learning and teaching activities in an online learning environment. Psycho-social effects in the field of education have been illuminated by the pandemic. Inclusive instructional designs and teaching activities are handled systemically and are carried out in a planned manner. For this reason, it is important to provide timely and accurate information, especially to address communication breakdowns and enhance teaching and learning capabilities with the planned systematic actions in terms of an inclusive learning design. The global pandemic caught some learning institutions unprepared, which gave them an opportunity to see their own capabilities in this light (i.e. manners, understanding, possibilities, and abilities), and allowed them to realize that providing quality assurance in education without sacrificing learning outcomes is a necessity rather than a choice. Developing the interests, needs, and perceivable latent individual potential can ensure high quality education. It is clear that learning environments designed on the basis of a curriculum that will provide individuals with knowledge, skills, and competence can promote inclusiveness.

Planned teaching and learning activities stand in contrast to emergency remote teaching (Bozkurt & Sharma, 2020a; Hodges et al., 2020). Based on the

applications, it is possible to say that the activities have come closer to a planned and systematic approach (Ashokka et al., 2020). Despite this, a lack in some social, economic, and cultural dynamics among these approaches still exists, not only in online learning environments, but also in traditional face-to-face learning environments. Whittle et al. (2020) describe an approach that balances the validity of existing frameworks with the emergent needs of participants, and allows them to acknowledge the novelty of the emergency remote teaching phenomenon rather than imposing an existing framework to make the data "fit" or purely collecting data to validate the theories (p. 313). Taking these arguments into account, within a planned and systematic approach there is still a lack of taking the technological and pedagogical issues from the past to the present as a basis within the scope of the emergency remote teaching environment. Although the concepts of social justice, equity, and equality have been emphasized from past to present, the challenging conditions brought by the pandemic have deepened the agenda. For example, considering the social and cultural dynamics within the scope of technology acceptance, it is worth asserting for eastern culture that perceived ease of use is a more significant predictor of behavioral intention and the use of a technology than perceived usefulness compared with western culture (Lee et al., 2009), which has implications for designers of inclusive learning in accounting for social justice. In addition to this, considering the result of Hamutoglu's (2021a) work, internal and external technological barriers should also be taken into account within the scope of technology acceptance. Moreover, Nash (2021) recommends to drive strategies that maintain awareness of cultural differences through information gathering and experience: (1) providing opportunities for communication that honor both students' cultural and learning preferences, (2) providing explicit course guidelines, expectations, and extended descriptions of course assignments, (3) addressing the implementation of collaborative work with students of diverse backgrounds, and (4) promoting students' cultural awareness through the critique of content. Bozkurt et al. (2020) state that the material, cultural-epistemic, and geopolitical inequalities, which have started to be visible clearly through the lens of the pandemic, are not new phenomena but are exacerbations of deeply rooted pre-existing inequalities. Accordingly, it is worth noting that the digital divide is not just an issue of today but stems from historical inequalities such as slavery, indentured labour, and colonialism (p. 6).

It is important to note that the concepts of social injustice and inequality, which have long existed, emerged in the educational agenda alongside the pandemic. In addition, the spread of teaching processes designed with a fair and equitable understanding emerged. The work of Iris Young is built on the argument that social justice in education must be understood in relation to particular contexts of enactment. It is argued specifically that it is not possible to make cross-national or other comparative assessments of social justice without consideration of the ways in which justice is enacted in practice. The contextualized approach to justice that the paper is advocating involves: (1) recognition of the multi-dimensional nature of justice and the potential for conflict between different facets of justice; (2) attention to the ways in which concerns of justice are mediated by the other norms and constraints that

motivate actors; and (3) a consideration of the way in which contradictions between different facets of justice and these other norms and between justice concerns and the constraints that compete with justice are differentially shaped by the levels and settings in which the actors are operating. Janakiraman et al. (2019) believe the multicultural population is becoming increasingly popular. This may be a result of people moving abroad for education and work. It may also be based on a need to ensure educational equality experiences between students from racial, ethnic, and social class groups.

This study aims to investigate this notion in a multicultural education course designed and taught by a professor in a qualitative case study. The results on the fourth and fifth dimensions of multicultural education developed by Banks (1993) and Banks (2015) called equity pedagogy and empowering school culture and social structure, respectively, showed that the detailed syllabus and schedule created by the professor helped students gain insights into how instruction can be effective in producing multicultural attitudes while teaching about multicultural education and ensuring educational equality. Santone (2018) stated that "privilege does not brush away the value of hard work." Hence, this report could provide a perspective for designing teaching and learning activities to ensure social justice and equality.

UNESCO (2021) offers to take a survey which is for building the future of education by participants' ideas, and the survey required a vote on the top challenges and purposes of education. To become a part of global initiative, UNESCO has launched a global debate on the Futures of Education–and a conversation on how knowledge and learning can shape the future of humanity and the planet (UNESCO, 2021). One question—"What do you think will be the world's greatest challenges in 2050?"—required participants to rank the top three challenges. These challenges included injustice, population growth, and migration/mobility as well. Another question offered to participants voting was "What should be the purposes of education in 2050?" and sustainability, justice, and skills for work also included to be voted among the top purposes. Finally, to analyze results, gender, age, country, and parents' education level were also taken into account to understand how educational challenges and purposes are viewed across the globe. It is believed that the results, based on different variables, will seek to understand the future of education, and this aim is to shed light on the big picture on justice, equity, and need to be taken into consideration with the basis of instructional design to reshape and rethink future education.

In the 2021 report, organized in cooperation with "We Are Social and Hootsuite," it is stated that 56.4% of the world's total population is urbanized and 66.6% of them are unique mobile phone users. It has been also stated that 59.5% are internet users and 53.6% are active social media users (We Are Social, 2021). Besides, it is stated in the report that there has been an increase in digital adaptation, change, and development since last year and the median age is 31. From a "glass half-full" perspective, these results show that nearly half of the world's population still suffers from urbanization problems and does not use mobile phones and the internet. Bozkurt and Sharma (2020b) stated that although humanity is aware of the divides in the field of cultural, religious, ethnic, and economics, now the witnessed digital

divide is far greater than it is imagined. On this ground, Bozkurt and Sharma (2020b) raised the following critical questions: "How to respond to the global community?" and "Should the gap continue to be allowed to widen, or should action be taken before the gap is out of control?" Despite being aware of these issues, the reality is that great inequalities pervade.

The issues given above are the main motivations to propose the current study. Based on these arguments, it can be said that an inclusive learning design should be evaluated within the scope of technological and pedagogical requirements and quality assurance in order to ensure social justice on the basis of emerging needs. Accordingly, the proposed study will be conducted with a holistic view from Bloom's Taxonomy, Maslow's Hierarchy, and Quality Assurance perspectives. The notion taken into consideration to promote an inclusive design will be identified through the themes of Universal Design for Learning (UDL) framework's three principles related to social justice: representation, action and expression, and engagement holistically on the basis of Bloom's Taxonomy and Maslow's Hierarchy. The discussion will be evaluated with the basis of Plan-Do-Check-Act (PDCA) cycle to ensure the quality assurance in terms of inclusive learning design, holistically, in line with individual and interpersonal needs and their capabilities (e.g., manners, understanding, possibilities and abilities).

The term social justice, equity, and equality has been an issue from past to present. Folger et al. (1995) underlines three faces of social justice: equity, equality, and need, and at three levels such as organizational/societal, interpersonal, and individual. This context will help to seek to take an active position and responses for the global community. Especially, considering the Reeves and Oh's (2017) study results, it has seen over two six-year periods, from 1989 to 2014, which identified the goals and methods of the studies specifically designated in the journal as "research papers" and mostly used quantitative and literature reviews methods. This chapter might fill the gap with a holistic view on Bloom's Taxonomy, Maslow's Hierarchy, and Quality Assurance perspectives. Hence, the proposed study was sought to answer the following question:

> How could an instructional design promote social justice and equity in learning communities, considering organizational/societal, interpersonal, and individual needs in line with their capabilities (i.g.manners, understanding, possibilities and abilities)?

Social Justice: Equity, Equality, and Needs in Learning Communities

Social justice has been a very important concept for many years. Now, more than ever before, social justice issues, learner inclusion, and cultural contexts have moved to center stage for educators designing and delivering education. The notes in which Papa (2020) expressed his/her thoughts on this subject as "As the neoliberal agenda has exacerbated social justice issues over the last 40+ years, the unregulated business and government economic interests have ensured that greed is a good

and if others suffer, so be it" (p.7). draws attention to the importance of the subject, and behind it, a very important need for education is also emphasized. Special attention has been given to education, as it is recognized as an important tool that can contribute to achieving social justice by not only providing all children with equal life opportunities, but also teaching them to be responsible for creating a more equitable and just world, and the challenges faced have been identified and analyzed. As stated in the work of Leiva et al. (2021) the neoliberal system has caused socio-educational inequalities and poor academic results, and these outcomes require preparing teachers to help reduce inequalities in the education system.

Accordingly, the focus of preparing teachers in their work has been to develop pedagogical disciplinary knowledge, leaving aside other areas that may contribute to tackling these educational inequalities, and specifically, the understanding of social justice, and the activities which are helpful to understand the construct of the concept, and had a positive impact on the participants' understanding of social justice, and provided insights into how to improve the curriculum in teacher education programs. Van Wingerden (2021) aims to propose a pedagogical design for learning management systems (LMS) that offers greater inclusion for students based on a number of theoretical perspectives and delineated through an example. This includes aspects of the critical theory, feminist theory, indigenous theory and practices, and new materiality, and described intentional LMS design by incorporating theoretically based practices. These theories and practices attend to inclusion, identities, and learning that can be considered socially aware, if not fully socially just. They also focus on increasing the student's sense of belonging and mental health through LMS design influenced by adult learning theory and the community of inquiry model. Hence, an integrated theory and praxis approach to LMS Design called Creating Inclusive Ideals: Pedagogy & Design Model (Van Wingerden, 2021) was designed for inclusion in terms of social justice, identities, and online design for digital spaces in higher education.

Bogotch (2021) believes that the word "justice" has a theological and legal definition and has attempted to solidify constructs by assuming around three fixed principles: (a) morally just outcomes are determined by natural laws; (b) culturally relevant legal practices and outcomes are based upon community standards or majority-held positions; and/or, (c) rule-governed judgements inside institutionalized legal proceedings rely upon legal precedents and traditions (p. 191). The connection between social justice and education could be provided by the quality assurance process. The justice variable is assumed as morally, culturally, and rule-governed judgements. However, considering the teaching and learning activities within a well-structured instructional design, it is required that the quality has already been assured through the fixed principles. For example, with the basis that morally just outcomes are determined by natural laws principle, the instruction should be designed and each step (i.e. course prerequisite) should have been delivered to the learners at the beginning of lecture. To give an example of the second principle of culturally relevant legal practices and outcomes based upon community standards or majority-held positions, the design of instruction should be transparent, open, and accountable through the quality process.

The learner should be able to convey to the instructor of the course the requirements of the learning environment in which he/she is a participant, as well as the directive communicated to him/her about the independent and individual practices of learning-teaching activities. This aspect provides an insight into the learning community in which the learner will be a participant; predicting the limitations in fulfilling the responsibilities that fall upon him/her in the formation of a learning culture may have an impact on his position. Finally, the third principle, that rule-governed judgements inside institutionalized legal proceedings rely upon legal precedents and traditions, could be taken into consideration based on measurement and assessment activities. That means all the teaching and learning activities in the learning environment are planned and the outcomes will be measured through the instruments informed at the beginning of lecture, and assessment methods will be presented as well. This approach might have been linked with the quality assurance process of PDCA (Plan-Do-Control-Act).

A Way for an Inclusive Design: A Holistic View from Bloom's Taxonomy, Maslow's Hierarchy and Quality Assurance Perspectives

The UDL guidelines are a tool for implementing Universal Design for Learning, a framework for improving and optimizing teaching and learning for all people based on scientific insights into how people learn. The UDL guidelines can be used by educators, curriculum developers, researchers, parents, and anyone who wants to implement the UDL framework in a learning environment. These guidelines provide a set of concrete recommendations that can be applied to any discipline or field to enable all students to access and participate in meaningful, challenging learning opportunities. The UDL guidelines have been updated several times in the past as they are intended to inform new research as well as feedback from the field. This update will focus specifically on addressing the systemic barriers that result in unfair learning opportunities and outcomes. CAST aims to develop a transparent, inclusive and community-driven process (The UDL Guidelines, 2021). Accordingly, while UDL is rising to equity as it is indicated on their guidelines, it is worth supporting the guidelines with a holistic view from Bloom and Maslow's hierarchy to have a comprehensive perspective related to inclusive teaching and learning design. Considering the principles of UDL such as representation, action and expression, and engagement, it could be seen that there is a strong relation with the framework of UDL, and Bloom and Maslow's each principle.

The first principle of UDL, representation asserts that learners differ in the way they perceive and understand the information presented to them. For example, those with sensory disabilities (e.g, blindness or deafness); learning difficulties (e.g, dyslexia); language or cultural differences, etc., may all require different ways of approaching the content. Others may grasp information faster or more efficiently

through visual or auditory means rather than printed text. Also, the transfer of learning and learning takes place when multiple representations are used, as it allows students to make connections within as well as between concepts. In short, there is no one way of representation that will be optimal for all students; it is essential to offer options for representation (The UDL Guidelines, 2021). The concept of representation is conducted to the recognition of network with the question of "what," and includes three guidelines: Perception (Access), Language and Symbols (Build), and Comprehension (Internalize). Each guideline has checkpoints and ways. For example, the perception guideline has three checkpoints (i.e. offer ways of customizing the display of information) and several ways to promote accessing of participants.

The second principle of UDL, action and expression, emphasizes that learners differ in the way they navigate a learning environment and express what they know. For example, those with significant movement disorders (e.g, cerebral palsy), those who struggle with strategic and organizational abilities (executive dysfunctions), those with language barriers and so on approach learning tasks very differently. Some may express themselves well in written text but not in speech or vice versa. Also, action and expression require a lot of strategy, practice, and organization, and this is another area where students can differ. In reality, there is no one medium of action and expression that would be optimal for all students. Providing options for action and expression is essential (The UDL Guidelines, 2021).

Finally, the third principle of UDL, engagement and affect, represents a crucial element for learning, and learners differ significantly in the way they are engaged in or motivated by learning. There are a variety of sources and various other factors that can influence individual variation in affect, including neurology, culture, personal interest, subjectivity, and background knowledge. While some students are quite preoccupied with spontaneity and novelty, others prefer the rigid routine, disconnected from these aspects, even frightened. Some students like to work alone, while others may prefer to work with their peers. In reality, there is no way of participation that will be optimal for all students in all contexts; offering multiple options for engagement is essential (The UDL Guidelines, 2021).

This approach, the checkpoints and ways, might be helpful to promote inclusive teaching and learning design in an online learning platform, as well. The principle of representation has some sections with the framework of Bloom and Maslow's. Considering the concept of the principle while it is related for resourceful, knowledgeable learners, present information and content in different ways, it is possible to see the sections on Bloom's cognitive, affective, and psycho-motor domains. Figure 1 shows Bloom's Taxonomy of Educational Objectives, cognitive domain (Armstrong, 2016).

As seen on Fig. 1, the revised framework is detailed by Bloom and his collaborators, and consists of six main categorizes: remember, understand, apply, analyze, evaluate, and create. From the top step to upper steps, cognitive skills and abilities are put to work. However, it is worth noting that the information that requires remembering and understanding is a prerequisite at the lowest level. The taxonomy is revised by a group of cognitive psychologists, curriculum theorists and

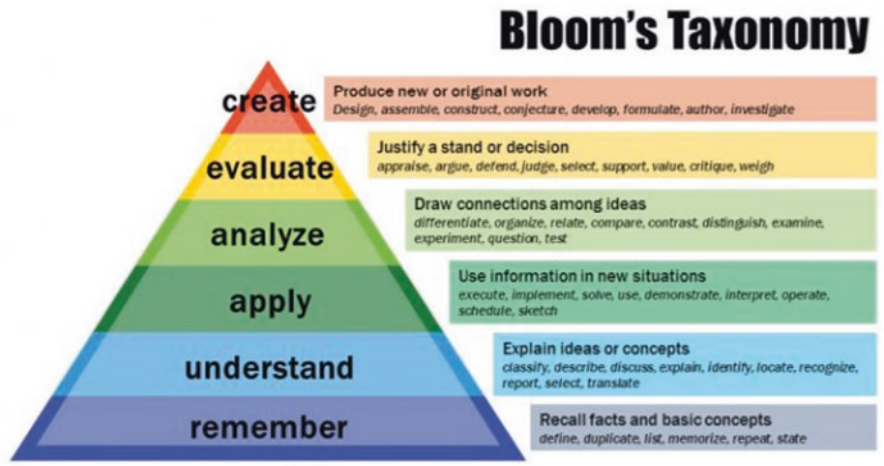

Fig. 1 Bloom's taxonomy of educational objectives: Cognitive domain

instructional researchers, and testing and assessment specialists in 2001, and draws attention away from the somewhat static notion of "educational objectives" (in Bloom's original title) and points to a more dynamic conception of classification (Armstrong, 2016, p. 2). The revised taxonomy highlights the dynamism on taxonomy by using verbs and gerunds (rather than the original taxonomy's nouns) to label their categories and subcategories.

These "action words" describe the cognitive processes in which thinkers encounter and work with information. While this revision offers a learner-centered approach, it also brings with it an inclusivity under the responsibility of the learner. For example, the category of "remember" is the basis of these cognitive processes and involves two sub-categorizes called "recognizing" and "recalling" gerunds as action words together with the verbs. The action words remind of the learner's responsibilities in the learning environment when they are expressed in a stimulating manner, and deal with responsibility sharing in the learning environment on an inclusive basis. The learner, who is at the center of the traditional face-to-face or online learning and teaching environment, is aware of what is expected of him/her within the scope of inclusive teaching activities. In the revised taxonomy, each category and sub-category invites the learner to the teaching and learning activities with the basis of knowledge, which is actually at the basis of these six cognitive processes as factual, conceptual, procedural, metacognitive knowledge as separate types and used in cognition. Table 1 shows the details about the subcategories of the main six cognitive processes and different types of knowledge (derived from, Armstrong, 2016).

Although it is seen that the revised taxonomy at K-12 and/or university level is used in the field of education, it is seen that this issue is widely limited to the cognitive learning field. However, when it comes to the depth of learning, it is very important that the affective and psychomotor domains of taxonomy should also be taken

Table 1 The Categories and Subcategories of Bloom's Revised Taxonomy with the basis of different types of Knowledge separately

Categories	Sub-categories	Types of knowledge
Create	Generating Planning Producing	Factual Knowledge Knowledge of terminology Knowledge of specific details and elements Conceptual Knowledge Knowledge of classifications and categories Knowledge of principles and generalizations Knowledge of theories, models, and structures Procedural Knowledge Knowledge of subject-specific skills and algorithms Knowledge of subject-specific techniques and methods Knowledge of criteria for determining when to use appropriate procedures Metacognitive Knowledge Strategic Knowledge Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge Self-knowledge
Evaluate	Checking Critiquing	
Analyze	Differentiating Organizing Attributing	
Apply	Executing Implementing	
Understand	Interpreting Exemplifying Classifying Summarizing Inferring Comparing Explaining	
Remember	Recognizing Recalling	

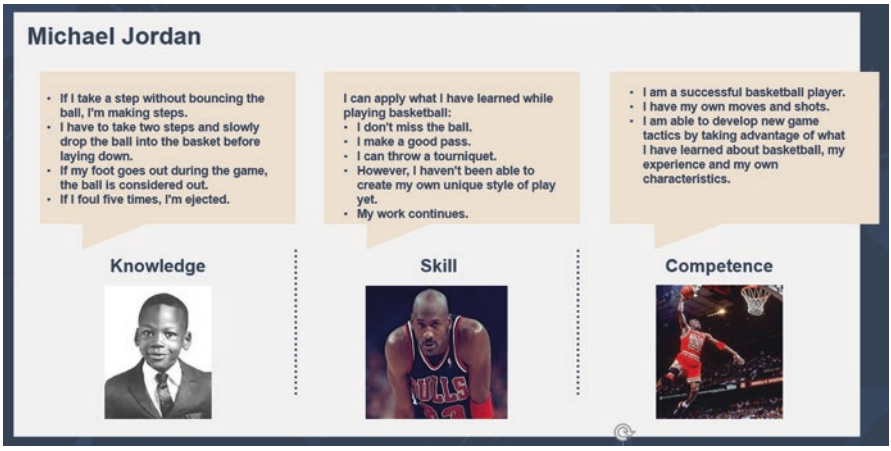

Fig. 2 The differentiation between knowledge, skill and competence issues

into account. The aim of transforming knowledge and skills into competence in the development of student success is clearly stated, so let's consider this situation through an example (Kutlu et al., 2017) that describes what Michael Jordan might say about basketball life from an early age in terms of knowledge, skills, and competence in Fig. 2:

Figure 2 clearly shows the differentiation between the concepts of knowledge, skill, and competence to achieve a qualification under a discipline in accordance

with the Bloom's three domains of taxonomy: cognitive, affective, and psychomotor. Accordingly, knowledge is the basis of six main of cognitive processes, especially considering from lower order thinking skills to high order thinking skills. Transforming student achievement into competence is the most important purpose of education (Kutlu et al., 2017); however, it may not be possible to deal with only the cognitive domain. In order to achieve the depth of learning, it is important that other affective and psychomotor areas of learning are among the targets so that the inclusiveness of the teaching can be expanded (Hamutoglu, 2021b). Because the affective field and psychomotor field activities in the area where the acquisition is desired are so important, this issue also concerns the sensory and memory activities of the limbic system and hippocampus in the brain. Considering that these two functions are equal in almost every healthy individual who has completed their development, planning learning activities independently of sensory and psychomotor domain gains will undoubtedly be weak in terms of achieving learning depth.

In terms of the biochemical and neurophysiological aspects of learning, the limbic system, which contains many structures, comes to the fore. Within this system, there are two basic structures related to learning, especially the hippocampus and amygdala, which control our learning, memory, instinct, and emotional behaviors (Yıldırım, 2014). The hippocampus plays an important role in learning and memory formation. The hippocampus is affected by all kinds of sensory perceptions (vibrations we receive from the environment we interact with). In humans, it has a formation that creates our new learning ability based on close memory and verbal symbolism. For example, a concept that we have never encountered before in the computer will enable us to remember it as a recent memory. However, when this newly learned concept is enriched with learning experiences, long-term memory will be activated for permanent learning. This memory becomes a long-term memory by constantly interacting with the ring called the papez circuit and the impulses (information) there (Yıldırım, 2014). In short, the reflection of the signals in the thinking process by exceeding a certain threshold value in this ring creates long-term memory. In this case, the learning environment should be enriched with activities (reflection questions, discussion forums, active learning techniques, etc.) that will provide continuous impulse transition in the ring of the students called the papez circuit.

The amygdala, on the other hand, is a nuclear (containing many nuclei) structure that receives continuous impulses (information) from the thalamus and cerebral cortex and has direct connections with the hippocampus (Yıldırım, 2014). If we look at its functions; The amygdala takes part in programming appropriate behavioral responses (Yıldırım, 2014). For example, while the formation of emotions such as joy, sadness, excitement, and depression is related to a part of the brain's cortex (orbito-frontal cortex), the management of behavioral responses to these emotions is carried out especially by the amygdala. While it has been determined that fear and anxiety in humans are mostly related to the left amygdala, it has been determined that happiness is related to the right amygdala (Yıldırım, 2014). Accordingly, hormones (dopamine, serotonin, endorphin, and oxytocin) that are effective on happiness can contribute to the formation of behaviors that will affect learning (for

example, reward and pleasure) by stimulating some nuclei in the amygdala through impulses.

Hence, the aforementioned functions of the brain, in terms of teaching and learning and related to affective domain providing inclusive activities, might be important to promote social justice. The importance of interacting with emotions, especially in memory formation, will undoubtedly bring the individual's ownership of the responsibility and interaction area in the learning center. At this point, a question from the perspective of inclusive instruction is "Which learning theory should we base our learning-teaching processes on?" Unfortunately, there is no such answer. To do this, Eclectic Philosophy comes to our aid, and it would be appropriate to use methods and practices that are compatible with the target audience, serve learning outcomes, and contribute to learning where the results can be evaluated. However, while doing this, it should not be forgotten to take into account the interaction of the two parts of the brain, called the "amygdala" and "hippocampus." Although Mullen's (2020) statement "Maslow before Bloom" is popular in education circles, it reminds us once again during the current global pandemic that this phrase is used to emphasize the issue of communicating how people's basic needs should be met before academic learning can be fully embraced.

In addition, if we look at the basics of Abraham Maslow's hierarchy of needs, it is a useful motivating force as well as the need for self-actualization; as opposed to the necessity of having "a [political system] for the winners and a system for the losers" in his article emphasizing the distinction between "jungle politics" appropriate for the majority trapped at the lower end of the motivational ladder, and "speciation politics" for self-actualizing elites; the idea that an inclusive instructional design should stay away from this distinction is dominant in this book chapter. As in both his political views and political evaluations, Herman (1995) stated the following are excerpts from some of Maslow's writings, which do not hesitate to come to the strict conclusion that in its hierarchical scheme it can support a self-fulfilling ruling class and lead to a two-tiered society:

> I think there are innate superiors and inferiors. How could there not be? Everything varies from more to less. But, on the other hand: (1) We must make the world safe for superiors. The lower the culture and the lower people are the more likely they are to resent and hate the superiors and so to kill them off and drive them into hiding and camouflage. The more we educate the bulk of the population, the better it will be for the elite, e.g., less danger, more audience, more disciples, protectors, financers, etc. Also the better the society and the institutional arrangements, the safer the world, the more synergic it is, the better is for eliteniks …

> It seems clear to me (I said) that the regime of freedom and self-choice which is desirable for innovating-creative people (and which they desire) can be ruinous for noncreative people who are too authoritarian, too passive, too authority-ambivalent, too noncommitted, etc.—ruinous at least in the sense that this regime permits them to fail, since it assumes resources which are not there…. So I vote in favor of making life better for the ones I call "good students,"—those who are autonomous, committed, dedicated, hard-working, etc.—and letting the others go hang….

> Also, the humanistic psychology absolutely needs a doctrine of an elite, degrees of humanness, health & sickness, winners & losers, aggridants (whether by heredity or by learning), good specimens, good choosers, no equal votes, nonequal weighting. The taste or judgment of one superior can & should outweigh 1000 or a million blind ones. (p. 272–273)

According to Bandura (2006) as a core discipline psychology is the only discipline that uniquely encompasses the complex interplay between biological, internal, interpersonal, and socio-structural determinants of human functioning, and it is particularly well-suited to advancing the understanding of the integrated biopsychosocial nature of humans and how they effectively manage and shape the everyday world around them. In addition to this, considering today's world, filled with social, informational, and technological changes accelerated by instant communicative access around the world, people's expanded opportunities exert their influence on events that affect their lives. Hence, the practice of individual and collective agency, which could truly deal with an inclusive instruction, is increasingly contributing to human development, adaptation, and change in almost every aspect of life to shape a better and sustainable future.

It is stated that quality assurance in education will play an important role in ensuring a learning ecosystem in sustaining this future (Hamutoglu et al., 2022). As a matter of fact, "MDG 1: Eradicate extreme poverty and hunger, MDG 2: Achieve universal primary education, MDG 3: Promote gender equality and empower women, MDG 4: Reduce child mortality, MDG 5: Improve maternal health, MDG 6: Combat HIV/AIDS, malaria and other diseases, MDG 7: Ensure environmental sustainability, MDG 8: Develop a global partnership" form the basis of 17 SDGs in practice today (Boeren, 2019), and one of these applications is quality education (SDA 4). Of these 17 goals, SDG 4 focuses on education, aims to provide accessible, inclusive, and equal quality education and to promote lifelong learning opportunities for all, and offers seven goals in this context (UN, 2021). Within the scope of "Quality Education," which is among the Sustainable Development Goals (SDG) and expressed as SDG 4, "education enables upward socio-economic mobility; is the key to escaping poverty. However, the statements that the global epidemic also has consequences that jeopardize the hard achievements in the field of education" (UN, 2021) are thought to emphasize the importance of creating a continuous and sustainable ecosystem in the field of OUL within the scope of quality education (Ossiannilsson, 2021).

It is stated that the effective design processes of online learning environments are in parallel with the Plan (P), Do (D), Check (C) and Act (A) cycles that work in providing quality assurance (Hamutoğlu & Başarmak, 2020). In addition, the continuity in the PDCA cycle and the activities carried out within the scope of the continuous improvement and development of the OAU environments, the continuous operation of a dynamic structure in increasing the quality and quality of the education specified in the scope of SKA 4, it is thought that it brings with it a dynamic and sustainable system approach for the future of education (Hamutoglu, Bozkurt, & Erdogan, 202X). Considering the needs of participants in both face-to-face and online learning environments, it is possible to think ways of inclusivity to ensure the learning outcomes and quality assurance are provided. Considering the dynamics

and characteristics of the learning outcomes of the target group, which includes families, could also be a way in terms of providing inclusivity. Especially in the third stage of the hierarchy of needs, loving and belonging could be provided in an active learning environments that include families as well.

It is important to meet individual needs in a learning environment. To do this, active learning strategies (e. g. Think/Pair/Share) for a large group instruction and/or classroom assessment techniques (e. g. RSQC2: Recall, Summarize, Question, Comment, and Connect) for use in sparking and assessing students' learning could be involved into the teaching and learning activities, and the involved activities could be evaluated within the quality assurance circle rather than categorizing the need for the winners and a system for the losers in the way of self-actualization. Utah University, The Center for Teaching and Learning Excellence presents a handout about creating an inclusive learning environments and explores several proactive ways to create and maintain an inclusive classroom (URL, 1). Accordingly, for a learning environment to be truly inclusive, it must actively grapple with issues of diversity and cultural awareness in a way that ensures that students from diverse backgrounds and experiences are both comfortable and safe. In addition to this, Hamutoglu (2021b) developed practical suggestions for the transformation of learning-teaching in an online course design that can also be taken as a basis for an inclusive instructional design. Finally, an implementation through the needs of participants could also be presented as an inclusive instruction (Hamutoglu et al., 2021). Figure 3 is summarized the actions taken into consideration to provide inclusivity in the teaching and learning environment.

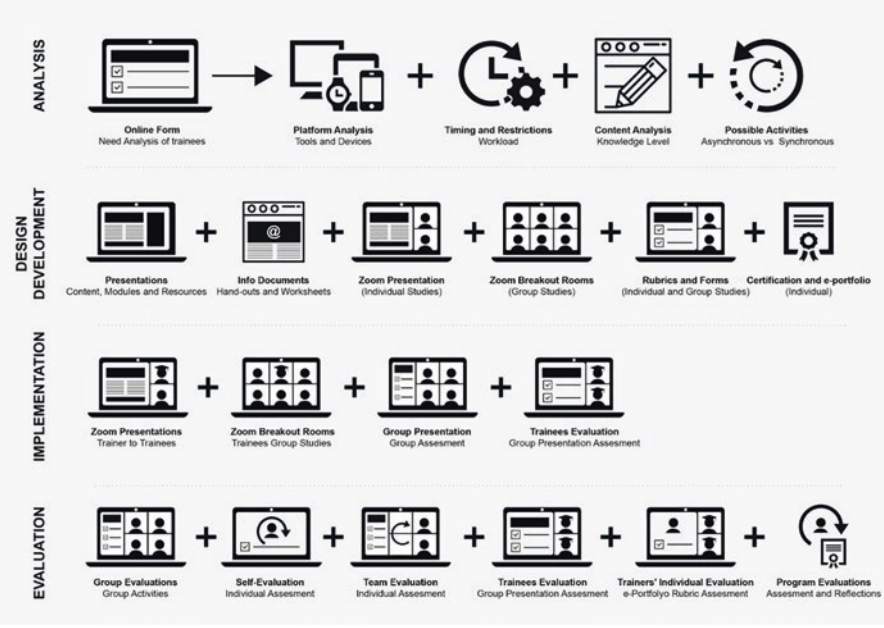

Fig. 3 A sample work for inclusivity based on ADDIE. (Hamutoglu et al., 2021)

Hence, starting from this point, it is believed that structuring the teaching and learning activities and the needs, expectations, learning styles, possibilities, and all staff should be analyzed previous to the beginning of the term. The findings obtained will be an input to provide the inclusivity of the instruction, especially for the designing, developing, and implementing activities.

Conclusion

Considering the five principles of social justice as (1) access to resources, (2) equity, (3) participation, (4) diversity, and (5) human rights, it is possible to assert the principles in a way to provide an inclusivity by Bloom's Taxonomy, Maslow Needs Analysis, and Quality Assurance holistically in line with individual and interpersonal needs and their capabilities (e. g. manners, understanding, possibilities, and abilities) while designing a face to face and/or online instruction. It is important in an inclusive instruction to grow together. To do this, planning, doing, checking and acting processes have a critical role in terms of providing quality assurance. The principles of UDL and its guidelines, checkpoints and the ways to do may also help to plan an inclusive instruction.

Representation: Plan, Do, Check, Act

The activities from the perspective of first principle of UDL address principles of social justice within the scope of the PDCA circle. It is important to represent the framework to the participants to get access, and build an inclusiveness in terms to improve and optimize teaching and learning activities. Hence, the quality assurance in the educational framework presents a circle which depends on Plan-Do-Check-Act (PDCA) steps. For example, while the perception (Access) guideline offers some ways of customizing such as "The color used for information or emphasis" and "The volume or rate of speech or sound" to the display of information is parallel to the principles of social justice while planning teaching and learning activities. In addition to this, the perception guideline also offers alternatives such as "Use text equivalents in the form of captions or automated speech-to-text (voice recognition) for spoken language" and "Follow accessibility standards (NIMAS, DAISY, etc.) when creating digital text" for auditory and visual information, respectively. Another guideline of representation principle of UDL is language and symbols (Build) have some checkpoints as clarifying vocabulary and symbols, clarifying syntax and structure, supporting decoding of text, mathematical notation, and symbols, promoting understanding across languages, and illustrating through multiple media, as well.

The sample ways offered by the checkpoints are "Embed support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage, translations)," "Make connections to

previously learned structures," "Allow for flexibility and easy access to multiple representations of notation where appropriate (e.g., formulas, word problems, graphs)," "Make all key information in the dominant language (e.g., English) also available in first languages (e.g., Spanish) for learners with limited-English proficiency and in ASL for learners who are deaf," and "Make explicit links between information provided in texts and any accompanying representation of that information in illustrations, equations, charts, or diagrams," respectively. Finally, the comprehension (Internalize) guideline of the representation principle of UDL could also be taken into consideration in the process of PDCA cycle. The checkpoints such as activating or supplying background knowledge, highlighting patterns, critical features, big ideas, and relationships, guiding information processing and visualization, and maximizing transfer and generalization offer following sample ways respectively: "Make explicit cross-curricular connections (e.g., teaching literacy strategies in the social studies classroom)," "Highlight previously learned skills that can be used to solve unfamiliar problems," "Provide interactive models that guide exploration and new understandings," and "Provide scaffolds that connect new information to prior knowledge (e.g., word webs, half-full concept maps)." Action and Expression: Plan, Do, Check, Act.

The principle of action and expression of UDL includes *physical action (Access), expression and communication (Build), and executive functions (Internalize) guidelines* and the offered ways could also be taken into consideration within the scope of PDCA cycle. For example, under the checkpoints of varying the methods for response and navigation, and optimizing access to tools and assistive technologies offers several ways for the cycle such as "Provide alternatives in the requirements for rate, timing, speed, and range of motor action required to interact with instructional materials, physical manipulatives, and technologies," "Build switch and scanning options for increased independent access and keyboard alternatives," respectively. Moreover, *expression and communication (Build) guideline* includes three checkpoints such as using multiple media for communication, using multiple tools for construction and composition, and building fluencies with graduated levels of support for practice and performance.

The sample ways for each checkpoint are listed as follows respectively: "Compose in multiple media such as text, speech, drawing, illustration, comics, storyboards, design, film, music, dance/movement, visual art, sculpture, or video," "Use web applications (e.g., wikis, animation, presentation)," and "Provide multiple examples of novel solutions to authentic problems." Furthermore, for the checkpoints of *executive functions (Internalize) guidelines* guiding an appropriate goal-setting, supporting planning and strategy development, facilitating managing information and resources, and enhancing the capacity for monitoring progress could be summarized, and the sample ways for each checkpoint are presented as follows: "Provide guides and checklists for scaffolding goal-setting," "Embed prompts to "show and explain your work" (e.g., portfolio review, art critiques)," "Embed prompts for categorizing and systematizing," and "Show representations of progress (e.g., before and after photos, graphs and charts showing progress over time, process portfolios)."

Engagement: Plan, Do, Check, Act

The principle of engagement includes three guidelines. The guidelines are as followed: recruiting interest (Access), sustaining efforts and persistence (Build), and self-regulation (Internalize). The recruiting guideline (Access) offers optimizing individual choice and autonomy, optimizing relevance, value, and authenticity, and minimizing threats and distractions checkpoints. While "Allow learners to participate in the design of classroom activities and academic tasks" and "Involve learners, where and whenever possible, in setting their own personal academic and behavioral goals" samples are presented as a way for the checkpoints of optimizing individual choice and autonomy; "Appropriate for different racial, cultural, ethnic, and gender groups" and "Design activities so that learning outcomes are authentic, communicate to real audiences, and reflect a purpose that is clear to the participants" ways are considered under the checkpoint for optimizing relevance, value, and authenticity. Finally, "Vary the social demands required for learning or performance, the perceived level of support and protection and the requirements for public display and evaluation" and "Involve all participants in whole class discussions" checkpoints are presented for the minimizing threats and distractions checkpoints.

The second guideline sustaining efforts and persistence (Build) includes following checkpoints: heightening salience of goals and objectives, varying demands and resources to optimize challenge, fostering collaboration and community, and increasing mastery-oriented feedback. Offered ways for each checkpoint are "Engage learners in assessment discussions of what constitutes excellence and generate relevant examples that connect to their cultural background and interests," "Vary the degrees of freedom for acceptable performance," "Encourage and support opportunities for peer interactions and supports (e.g., peer-tutors)," and "Provide feedback that models how to incorporate evaluation, including identifying patterns of errors and wrong answers, into positive strategies for future success" respectively. Finally, self-regulation (Internalize) guideline emphasizes promoting expectations and beliefs that optimize motivation, facilitating personal coping skills and strategies, and developing self-assessment and reflection checkpoints with following offered sample ways, respectively: "Provide coaches, mentors, or agents that model the process of setting personally appropriate goals that take into account both strengths and weaknesses," "Appropriately handling subject specific phobias and judgments of 'natural' aptitude (e.g., 'How can I improve on the areas I am struggling in?' rather than 'I am not good at math')," and "Offer devices, aids, or charts to assist individuals in learning to collect, chart and display data from their own behavior for the purpose of monitoring changes in those behaviors."

In this regard, turning off the PDCA cycle is very important in terms of continuity and sustainability and is a real indicator in providing quality assurance. At this point it is worth to remember Albert Einstein's words: "Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid." Accordingly, the inclusiveness of the planned and applied teaching and learning activities should be checked and revised considering the learning

outcomes and other national and/or international frameworks. To do this, need analysis could be a way at this point because it is important to get information about the target group in teaching and education environment. The needs of participants will be decisive on the designing of instruction as well. Needs analysis, learner analysis, learning content analysis, learning and teaching method, material, environment, equipment analysis and measurement-evaluation analysis should be considered in the planning section in accordance with the national and international qualification framework to be gained knowledge, skill, and competence through the demanded twenty-first century learner profile.

The instructors plan their teaching and learning activities with the basis of learner needs and identify learning outcomes considering the Bloom's Taxonomy of Educational Objectives with the basis of different domains. Thus, the issues related to limiting the content to be learned and gaining knowledge, skill, and competence can be extended with Bloom's cognitive, affective, and psychomotor learning areas to provide learning depth. This cycle also has a supportive role in terms of foreseeing the barriers and getting a fast adaptive action for an inclusive instruction design. Additionally, from quality assurance perspective it is also possible to say that to promote social justice a well-planned instruction provides to participants a way to access the resources equally and considering the diversity include strategies to encourage participation, and inform about human rights at the representation of course design. Finally, family or friendship involvement (i.e. group activities) also could be planned considering the cognitive, affective and psych-motor acquisitions through the findings on need analysis to enhance the effectiveness and/or lack of the need on love/belonging to a group/classroom in face to face and/or online teaching and learning environment.

Recommendations

Considering each principle's relation to Bloom and Maslow's framework, it may seem reasonable for the next steps to assume people have an idea of social justice, and the views of participants could be obtained by a survey, and the survey responses could be taken into consideration with a qualitative research method in depth in order to see the participants' needs from the perspective of Maslow and Bloom for planning teaching and learning activities. However, this recommendation for the next steps is not intended to confirm if anything people do for social justice, but it might have been seeking to see the importance of psychological needs and learning outcomes while designing instruction and learning in an online learning environment.

For the next studies, the phenomenological situation might be useful to be highlighted with the approach of Freire's conception of praxis. Accordingly, this concept is defined as "reflection and action upon the world in order to transform it" (1970, p. 51), and is a useful guide for learning to engage issues we have been conditioned through social systems and the dominant practices of our field to neither see nor understand. Praxis is a process by which people develop an understanding of their

condition and by which they can liberate the oppressed, and themselves along with them. Based on the Freire's conception of praxis it is going to be engaged with self-examination and making a place for deep consideration of social justice and equity issues through the methodology of the study. This approach sought to meet the requirements in both personal dealings and professional work, and to develop a practice of intentionally identifying and reflectively addressing them in education and professional work. Accordingly, an interview form could be organized through the principles of Maslow's Hierarchy of Needs and the Revised Taxonomy of Bloom, and findings obtained from the interview form might seek to design instruction and technology to promote social justice and equity in learning communities.

It is thought that, on the next studies the developed survey responses could be helpful to structure the instruction and learning design. In the development of the data collection tool based on for the future studies could be comprised on the principles of Maslow's Hierarchy of Needs and the Revised Taxonomy of Bloom which is inspired by Bradshaw's (2018) study in which he reevaluates the timeline of instructional design and technology from the perspective of social justice. Bradshaw (2018) states, "If close attention is given to these social justice events in connection with Bloom and Maslow's works, what principles can be illustrated? How might such inquiry inform practice and theoretical work in IDT? How does the instructional system itself reinforce structures of inequity, injustice, and oppression? and How can my designs disrupt systems of oppression?" These statements and questions could be the motivation for developing a data collection tool for the consideration of the principles of Bloom and Maslow, which will serve as the phenomenological method. As Zinn (1969) observed, "You can't be neutral on a moving train." (cited in Bradshaw, 2018, p. 342) and Bradshow stated that "Claiming neutrality in matters of injustice is actively supporting and exacerbating them" (p.342). Accordingly, considering Bradshaw's (2017, 2018) study, it is a must to explore the way of reconciling and integrating the struggles both individually and collectively, for critical consciousness and education for freedom, with the primary purposes and responsibilities of our field, and to seek and learn other ways of engaging, such as dialectics instead of debates, cultural synthesis instead of cultural invasion for next studies.

References

Armstrong, P. (2016). *Bloom's taxonomy*. Vanderbilt University Center for Teaching. https://evawintl.org/wp-content/uploads/Blooms-Taxonomy.pdf

Ashokka, B., Ong, S. Y., Tay, K. H., Loh, N. H. W., Gee, C. F., & Samarasekera, D. D. (2020). Coordinated responses of academic medical centres to pandemics: Sustaining medical education during COVID-19. *Medical Teacher, 42*(7), 762–771.

Bandura, A. (2006). Toward a psychology of human agency. *Perspectives on Psychological Science, 1*(2), 164–180.

Banks, J. A. (1993). Multicultural education: Historical development, dimensions, and practice. *Review of Research in Education, 19*, 3–49.

Banks, J. A. (2015). *Cultural diversity and education: Foundations, curriculum, and teaching*. Routledge.

Boeren, E. (2019). Understanding Sustainable Development Goal (SDG) 4 on "quality education" from micro, meso, and macro perspectives. *International Review of Education, 65*(2), 277–294. https://doi.org/10.1007/s11159-019-09772-7

Bogotch, I. (2021). Afterword: inserting social justice into professional development. *Professional Development in Education, 47*(1), 191–196. https://doi.org/10.1080/19415257.2020.1848490

Bozkurt, A., & Sharma, R. C. (2020a). Education in normal, new normal, and next normal: Observations from the past, insights from the present, and projections for the future. *Asian Journal of Distance Education, 15*(2), i–x.

Bozkurt, A., & Sharma, R. C. (2020b). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education, 15*(1), i–vi.

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education, 15*(1), 1–126.

Bradshaw, A. C. (2017). Critical pedagogy and educational technology. In A. D. Benson, R. Joseph, & J. L. Moore (Eds.), *Culture, learning, and technology* (pp. 8–27). Routledge.

Bradshaw, A. C. (2018). Reconsidering the instructional design and technology timeline through a lens of social justice. *TechTrends, 62*(4), 336–344.

Folger, R., Sheppard, B. H., & Buttram, R. T. (1995). Equity, equality, and need: Three faces of social justice. In B. B. Bunker & J. Z. Rubin (Eds.), *The Jossey-Bass management series and The Jossey-Bass conflict resolution series. Conflict, cooperation, and justice: Essays inspired by the work of Morton Deutsch* (pp. 261–289). Jossey-Bass/Wiley.

Freire, P. (1970). *Pedagogy of the oppressed*. Continuum.

Hamutoglu, N. B. (2021a). Testing the effects of technological barriers on high school teachers' role in technology integration. *Asian Journal of Distance Education, 16*, 74–89.

Hamutoglu, N. B. (2021b). Dijital Çağda Öğrenme ve Öğretme [Learning and teaching in the digital age]. In S. Yilmaz-Ozelci & Y. Yilmaz (Eds.), *Dijital Çağda Öğrenme ve Öğretmede Dijital Dönüşüm* [Digital transformation in learning and teaching in the digital age]. Pegem Akademi Yayıncılık.

Hamutoğlu, N. B., & Başarmak, U. (2020). Çevrimiçi Öğrenme Ortamlarının Tasarımı [Design of online learning environments]. In K.-E. Çakmak & S. Karataş (Eds.), *Çevrimiçi Öğrenme Farklı Bakış Açıları* [Different perspectives on online learning]. Pegem Academy Publishing.

Hamutoglu, N. B., Ozdamar, N., Gedik, N., & Kapkin, E. (2021). Designing and managing synchronous and asynchronous activities: The online training case for faculty of aeronautics and astronautics Staff. In G. Durak & S. Cankaya (Eds.), *Handbook of research on managing and designing online courses in synchronous and asynchronous environments* (pp. 51–76). IGI Global. https://doi.org/10.4018/978-1-7998-8701-0

Hamutoglu, N. B., Bozkurt, A., & Erdogan, B. Z. (2022). *Sürdürülebilir Eğitim Ekolojisi olarak Açık ve Uzaktan Öğrenme* [Open and distance learning as sustainable education ecology]. Türkiye Bilimler Akademisi [Turkish Academy of Sciences].

Herman, E. (1995). *The romance of American psychology: Political culture in the Age of Experts*. University of California Press. https://publishing.cdlib.org/ucpressebooks/view?docId=ft696nb3n8;brand=ucpress

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). *The difference between emergency remote teaching and online learning.* https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Janakiraman, S., Watson, W. R., Watson, S. L., & Bawa, P. (2019). Instructional design and strategies for multicultural education: A qualitative case study. *Journal of Educational Research and Practice, 9*(1), 21.

Kutlu, Ö., Doğan, C. D., & Karakaya, İ. (2017). *Ölçme ve değerlendirme: Performansa ve portfolyaya dayalı durum belirleme* (5. baskı). Pegem Akademi.

Lee, Y., Kozar, K. A., & Larsen, K. R. (2009). Avatar e-mail versus traditional e-mail: Perceptual difference and media selection difference. *Decision Support Systems, 46*(2), 451–467.
Leiva, L. R., Miranda, L. P., & Riquelme-Sanderson, M. (2021). Social justice in the preparation of English language teachers. *MEXTESOL Journal, 45*(2), n2.
Mullen, G. (2020). *Maslow before Bloom*. Retrieved August 30, 2020, from https://www.exploringthecore.com/post/maslow-before-bloom
Nash, C. M. (2021). Inclusive pedagogical practices in online courses. In *Research anthology on instilling social justice in the classroom* (pp. 308–324). IGI Global.
Ossiannilsson, E. S. (2021). Resilient sustainable education for the future of education: Emerging challenges. In A. Bozkurt (Ed.), *Handbook of research on emerging pedagogies for the future of education: Trauma-informed, care, and pandemic pedagogy* (pp. 16–43). IGI Global. https://doi.org/10.4018/978-1-7998-7275-7.ch002
Papa, R. (2020). *Handbook on promoting social justice in education*. Springer.
Rao, K. (2021). Inclusive instructional design: Applying UDL to online learning. *The Journal of Applied Instructional Design, 10*(1). https://doi.org/10.51869/101kr
Reeves, T. C., & Oh, E. G. (2017). The goals and methods of educational technology research over a quarter century (1989–2014). *Educational Technology Research and Development, 65*(2), 325–339.
Rose, D. H., Meyer, A., & Hitchcock, C. (2005). *The universally designed classroom: Accessible curriculum and digital technologies*. Harvard Education Press.
Santone, S. (2018). *Reframing the curriculum: Design for social justice and sustainability*. Routledge.
The UDL Guidelines (2021). https://udlguidelines.cast.org/
UN. (2021). *Sustainable Development Goals-SDG*. Retrieved from: https://www.un.org/sustainabledevelopment/education/
UNESCO. (2021). *Futures of education*. Retrieved from: https://en.unesco.org/futuresofeducation/
URL 1. Utah University, The Centre for Teaching and Learning Excellence. https://ctle.utah.edu/resources/pdfs/Inclusive%20Classroom%20handout.pdf
Van Wingerden, C. (2021). Designing for Inclusion within the learning management system: Social justice, identities, and online design for digital spaces in higher education. *International Journal of Educational and Pedagogical Sciences, 15*(8), 684–692.
We Are Social. (2021). *Digital 2021: Global overview report*. Retrieved from: https://www.slideshare.net/DataReportal/digital-2021-local-country-headlines-report-january-2021-v03
Whittle, C., Tiwari, S., Yan, S., & Williams, J. (2020). Emergency remote teaching environment: A conceptual framework for responsive online teaching in crises. *Information and Learning Sciences, 121*(5/6), 311–319. https://doi.org/10.1108/ILS-04-2020-0099
World Health Organization-WHO. (2021). https://covid19.who.int/
Yıldırım, M. (2014). *Topografik Anatomi* (2. Baskı). Nobel Tıp Kitabevleri.

Libraries as Addressing STEM Equity Issues in Underserved Urban Settings

Andrew A. Tawfik, Craig Shepherd, and Linda Payne

Libraries as Addressing STEM Equity Issues in Underserved Urban Settings: Literature Review

Studies show there is a considerable need to address educational equity gaps, especially for STEM students in underserved and marginalized settings (Shtivelband et al., 2017). Although extensive studies have explored equity problems within K-12 *schools*, another way to approach this issue is through informal libraries. Indeed, a recent meta-analysis confirmed the importance of academic preparation and educational contexts to address equity in STEM, but also highlighted empirical studies whereby "informal science opportunities can contribute to the preparation of a greater number of students who are able to successful[ly] pursue STEM" (Bottia et al., 2021, p. 634). When extending learning beyond the K-12 classroom, urban libraries act as "connected learning hubs" that address issues of equity because they are free, readily accessible, and situated within a community (Houghton et al., 2013; Woods & Hsu, 2020). The library resources and informal nature of instruction thus support lifelong learning for a variety or age groups and demographics (Hyeon et al., 2020). The Federal STEM Education Strategic Plan noted that libraries are synergistic with STEM informal learning programs to address equity issues, especially as libraries adapt strategies towards digital resources. Tawfik et al. (2021) further argued that libraries are distinctively suited to be part of community STEM ecosystems given their (a) collaborative learning spaces, (b) access portals to open-educational resources and diverse digital materials, and (c) opportunities to refine research and information-seeking skills. However, further research is needed to understand how libraries can address equity problems through informal learning programs.

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Challenges of Informal STEM Learning in Libraries

Research has shown that access to informal STEM programs—particularly programs that allow students to engage in science and engineering practices (SEPs)—can support students' science identity development (Calabrese Barton et al., 2013). Informal STEM programs often employ inquiry-based learning (IBL) that includes case-structured curriculum, collaborative learning, self-directed learning, teacher facilitation, and reflection (Kim et al., 2019). Inquiry-based learning often poses learners with an ill-structured problem that include latent variables and unclear goals. Because the cases posed in this learning strategy are representative of authentic issues, the problems are often constrained by contextual considerations and domain-specific criteria for evaluation of the solution. The learners engage in information seeking (Belland & Kim, 2021) and later justify their solution in light of the evidence discussed among peers (Ju & Choi, 2017; Valero Haro et al., 2019). In doing so, inquiry-based learning may represent a more complete introduction to the culture of science and collaborative learning than traditional teaching methods given its emphasis on contextualized, ill-structured problem-solving (Lazonder & Harmsen, 2016).

While these programs may address issues of access, it is difficult to administer STEM IBL in library settings because librarians are trained for inquiry and thus have varying degrees of domain knowledge (Shtivelband et al., 2017). Moreover, the literature indicates that STEM curricula include other challenges in library settings. Informal learning programs are often siloed on either (a) content and skill acquisition or (b) equity improvement in science education (Glazewski & Ertmer, 2020). *Content-focused programs* deliver predetermined curricula about topics, such as robotics, geospatial skills, or computer science (Mouza et al., 2016). Participants often select these programs voluntarily, based on pre-existing interests or achievements. In contrast, *equity-focused programs* create new ways to engage in science and problem-solving beyond access, with a goal of supporting students' identity-building in science (Blanchard et al., 2015; Mouza et al., 2016). Equity-focused programs typically do not use predetermined curricula; instead they develop programs in response to community interests, which requires a customized design that can be costly to develop and implement.

Project Goal

While the literature suggests that libraries can be used to address issues of access and equity, very little is known about how to design and develop digital materials specifically for librarians as they employ informal learning. To address this gap cited in the literature, this project team sought to develop an informal, inquiry-based STEM curriculum to address issues of equity and access within underserved areas of Memphis, TN. Because children's interest in STEM begins to decrease in grades 3–5 (Catsambis, 1995), the project designed the curriculum for this age group. The

goal was to design a curriculum that was relevant to the population and within their zone of proximal development.

The project team consisted of two instructional design faculty, two instructional design doctoral students, and two subject matter experts from engineering. The team's initial plan was to design informal case studies that adhered to Next Generation Science Standards (NGSS) with crosscutting engineering principles. However, the project team also wanted to design a curriculum specifically designed for informal educators and the unique skills librarians possess, namely information-seeking. This design case highlights unique tensions associated with (a) content designed to suit librarian's skill sets (e.g., inquiry; information seeking), (b) designing cases around the needs and interests of underserved communities, and (c) designing an open-access curriculum that is representative of the community but can be adapted by other public libraries.

Designing Content Uniquely Suited for Librarian Skill Sets

In classroom approaches to IBL, designers must anticipate how learners will interact with content and how educators facilitate instruction when learners reach an impasse (Ertmer et al., 2009). Moreover, the design must take into account an array of other factors, such as the learner's level of prior knowledge, strategies for self-directed learning, scaffolding, and iteration of problem-solving (Belland et al., 2013). These issues were important to our case, but posed unique design challenges. In many IBL settings, the instructor serves as the facilitator with domain expertise. Thus, designers align external guidelines (like NGSS) to STEM expert (teacher) and novice (student) skill sets as they navigate design decisions. In the current design case, the setting and informal nature of our case necessitated that public librarians be the ones to facilitate the curriculum. Hence, the design team could not make the same assumptions about how librarians might approach the STEM content. In lieu of varying expertise with domain knowledge, the team chose to rethink the design in terms of skill sets the librarians did possess: inquiry, information seeking, and community involvement. Based on these skill sets, we opted to align the curriculum with both the NGSS and the American Association of School Librarians (AASL) standards. The engineering track of the NGSS afforded opportunities for design, prototyping, and iteration, germane to the Makerspace movement within libraries (Shepherd et al., 2017). The AASL standards also provided guidance on how to support specific inquiry tasks, such as seeking and organization of information within informal settings.

An important consideration was how to direct inquiry and information seeking around engineering cases given varying levels of STEM background knowledge by the educator and learner. Because ill-structured cases have multiple solutions, IBL can overwhelm cognitive load and preclude meaningful learning. Early design discussions focused on two main issues—variable latency and problem space scope. In terms of the former, the ill-structured nature of cases often includes both latent and

Fig. 1 Focusing scope and designing for directed inquiry

salient variables. That is, important concepts are often hidden within case details and become apparent through deep inquiry and iterative problem-solving (Jonassen, 1997). To mitigate this challenge, the problem space was used to determine and highlight core engineering variables and main ideas (e.g., design a safe enclosure), often derived from the NGSS. The related conceptual space entailed tertiary ideas (e.g., engaging the community) that were less relevant to primary learning outcomes.

To balance the open-ended nature of IBL and support effective inquiry, the team designed cases that were relatively salient to the intended audience and posed multiple, yet limited, choices. For example, one case asks learners to engineer a multi-animal enclosure as part of a zoo update. Initially, the design team thought it best to allow learners to select and combine animals based on their local zoo options. We initially believed this would be more engaging as learners identified animals they were especially interested in, along with supporting self-directed learning. However, because the learner's prior knowledge was unknown, this shifted greater responsibility to navigate the problem space to librarians. To help librarians direct learner inquiry, the team ultimately suggested six animals for consideration, which limited the scope while maintaining the open-ended nature of IBL (see Fig. 1). In doing so, the design now affords learner autonomy over their animal decision-making and information-seeking, while also constraining the problem space.

Designing Cases Around the Unique Needs of Diverse Communities

Designing representative cases of the community is important to engage learners from underserved populations, including home and community settings where learning occurs naturally through routine practice (Nasir & Hand, 2006). To identify

community interests, designers conducted multiple meetings with public librarians and a Memphis community developer. Additionally, designers scoured local news for relevant events and observed a children's museum and zoo. Based on collected information, we identified issues related to "food desserts" and public amenities (community center, public transportation, etc). In the context of the project, designers contextualized these issues as cases for urban gardening, sustainable food packaging, bike lane construction, playground development, zoo animal enclosures, and vertical maze development. Learners would then analyze these variables and identify topics suitable for library research (e.g., animal habitat development, garden pest control procedures, renewable resources). Following library research, the curriculum asks learners to hypothesize solutions, develop prototypes, obtain feedback, and make revisions. To frame inquiry around librarian skill sets, developers organized activities around the Think, Create, and Share AASL domains.

Each case was initially designed to provide 1 to 2 weeks of instruction as learners navigate the setting, design problem, and salient variables. However, feedback obtained from local librarians during development, reiterated that public libraries struggled to retain some learners over time with informal STEM activities. To account for absenteeism and attrition, cases were further designed to borrow themes, inquiry approaches, and research practices from each other. Learners could therefore attend a session regarding urban garden development and apply knowledge gained from that session in later cases regarding food packaging or animal enclosure design. These overlaps reduced entry barriers. Additionally, we shifted our design towards a more 'stand-alone' approach to address issues of attrition. Although cases retained multiple activities that built on each other and concluded with a group reflection and celebration of explored ideas, each activity provided entry points for new learners (with a recap of the case) and a specified end-goal for closure. Thus, learners who periodically attended sessions could more easily enter the learning environment and obtain closure at the end of each activity. These "mini-outcomes" also provided greater opportunity for short-term wins and reflection.

Designing for diverse audiences also required the team to consider a wide array of literacy skills and access and dissemination approaches. Personal communication with school and community leaders indicated that some target learners struggled with grade-level literacy skills. To account for these struggles, the team developed brief, animated videos to introduce and conclude each case (see Fig. 2). Videos use audio and visuals to present the complexities of each STEM problem and depict diverse characters representative of many cultures. However, due to budget limitations, we were unable to record diverse voices or languages. To scaffold learner inquiry, each case includes a learner guide. These guides retain the Double-0 STEM Agent themes, characters, and design specifications. Activities within these guides correspond to library activities. However, guides contain three to five question prompts to help learners consider and reflect on activity topics and outcomes. These guides can be accessed and completed through computer technologies or print.

Fig. 2 Case video to increase learner comprehension, retention, and representation

Designing for Open-Access Content

Embedding learning within community interests facilitates informal STEM learning (NRC, 2015). At the same time, we wanted to design the STEM materials using an open-educational resource (OER) approach, which the literature suggests may address some issues of equity and access (Kimmons, 2021; Tang, 2020). Although the local audience was very specific (3–5-grade learners in Memphis, Tennessee), designers were interested in developing OER materials that could be used in other library contexts. When designers examined local issues, they considered their ability to transfer to other cities and maintain learner interest. For example, food deserts in low-income neighborhoods without grocery stores and access to fresh produce is a concern in some Memphis communities. So too is the prevalence of obesity and obesity-related disorders. Designers wanted to include a case on healthy eating to tie local needs with the NGSS. However, they did not want to stigmatize learners' family members and friends with these health concerns. Additionally, they did not want to preclude interest in the case for communities and cities with access to grocery stores. Hence, the design challenge was to situate and represent a local community within the cases, but also make it relatable for other librarians who might adopt the curriculum in other cities or rural contexts.

Each case sought to balance the needs of librarians, local 3–5-grade learners, and larger audiences. Specifically, designers wanted cases to provide guidance to librarians while remaining flexible to local needs and interests. Designers bounded the problem space and identified salient case features while providing flexibility for learners to fine-tune the experience within community contexts.

For example, while all learners develop environmentally friendly food packaging, they base designs around locally grown produce. Thus, librarians maintain a manageable subset of topics to cover while simultaneously providing choice based on learner interests. All cases are also organized around thinking, creating, sharing, and growing activities, which are directly aligned with AASL standards. However, librarians choose activities based on community interests, resources, and familiarity.

Additionally, designers needed to consider dissemination approaches that promoted access for the OER resources. Some learners lack reliable computer and internet access at home, while others are largely dependent on smartphones. To encourage access, content was designed to accommodate dated equipment, and only brief video segments, text, and images were used to minimize bandwidth. A related issue focused on the authoring tool. Although the project hoped to design with more softwares that would allow us to generate and host content, the design team was cognizant of the costly nature of many existing authoring tools. Hence, we chose Edtechbooks.org as a free, open educational resource (OER) to disseminate content. While this shifted some of the technical decisions related the project, it allowed the team to make the curriculum in a format available to all audiences under a Creative Commons Attribution 4.0 International license. Once development in EdTech Books began, the project team realized the importance of (a) offering case content in two harmonized forms: one designed for educators and one designed for learners and (b) segmenting content for all users in a clear, digestible manner.

Customized Content Views

Developing two forms of content uniquely designed for the appropriate audience afforded designers the ability to scaffold librarian needs within the activities in terms of materials, set up, etc., without bombarding student learners with extraneous information that had the potential to cause cognitive overload. For the learners, the design team created a separate handbook, labeled “agent handbook” to reinforce the agent/spy theme. This approach gave learners the scaffolding they needed (e.g., grade-level instructions and guiding questions) without any extraneous educator information, as well as a space to take notes for each activity. As Fig. 3 shows, the agent handbook was designed to reinforce the agent/spy theme chosen to appeal to the interest level of 3rd – 5th graders. A snapshot of student activities were provided in a seperate educator handbook so that librarians could see it at a glance or gloss over it as needed (See Fig. 4 for an example of agent view content within ETB). Furthermore, the project team was careful to ensure that activity numbering in the librarian materials aligned in the learner handbooks to avoid possible confusion for librarians when moving between documents.

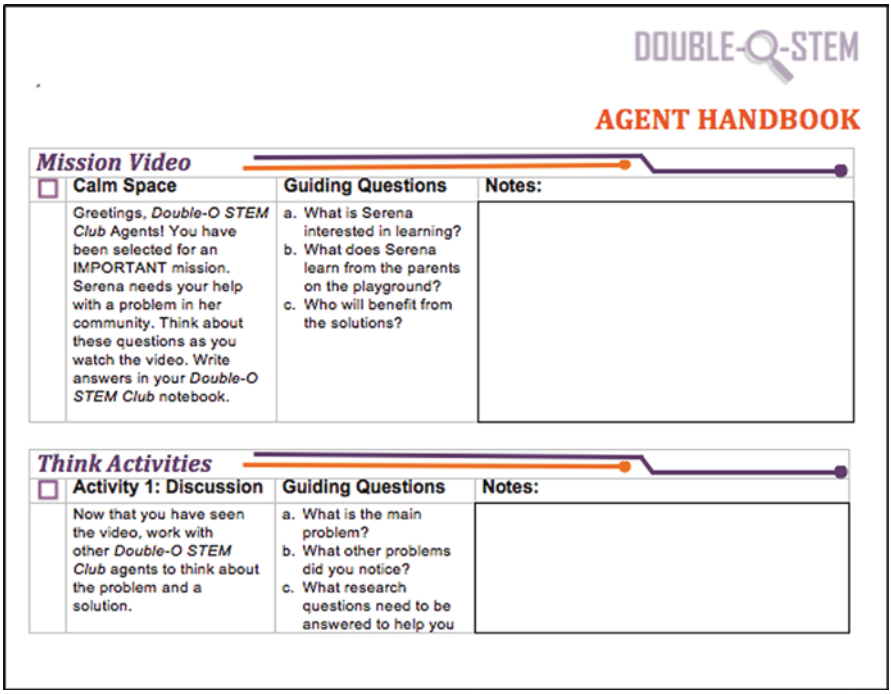

Fig. 3 Excerpt from agent handbook designed for 3rd – 5th grade level learners

Segmented Content

A key best practice in content design and instructional design is to segment content so that it is organized in a logical, meaningful way to avoid extraneous cognitive load (Mayer & Moreno, 2003; Sweller, 2020). To help achieve this, an instructional designer on the project team was able to work with the managing editor and lead developer at ETB to add accordion functionality (a design element not typically used in online books on the ETB site), which allowed the designer to organize content visually to best suit the needs of librarians. Specifically, this design accommodation allowed the project team to hide certain areas of content as needed so librarians could focus on the content at hand and reveal additional content as needed.

Below the initial video introducing the STEM case and problem scenario, the content was segmented into the following three areas: (1) a Getting Started section, which included a case guide for librarians/educators and a list of case-level goals and objectives, (2) a Learning Activities section containing the bulk of the content, which was organized into three areas, labeled "Think," "Create," and "Share and Grow," based on the domains used in the National School Library Standards crosswalk with NGSS, and (3) a case reflection section where learners share their artifacts with peers. Figure 4 shows a case where learners were tasked with designing a

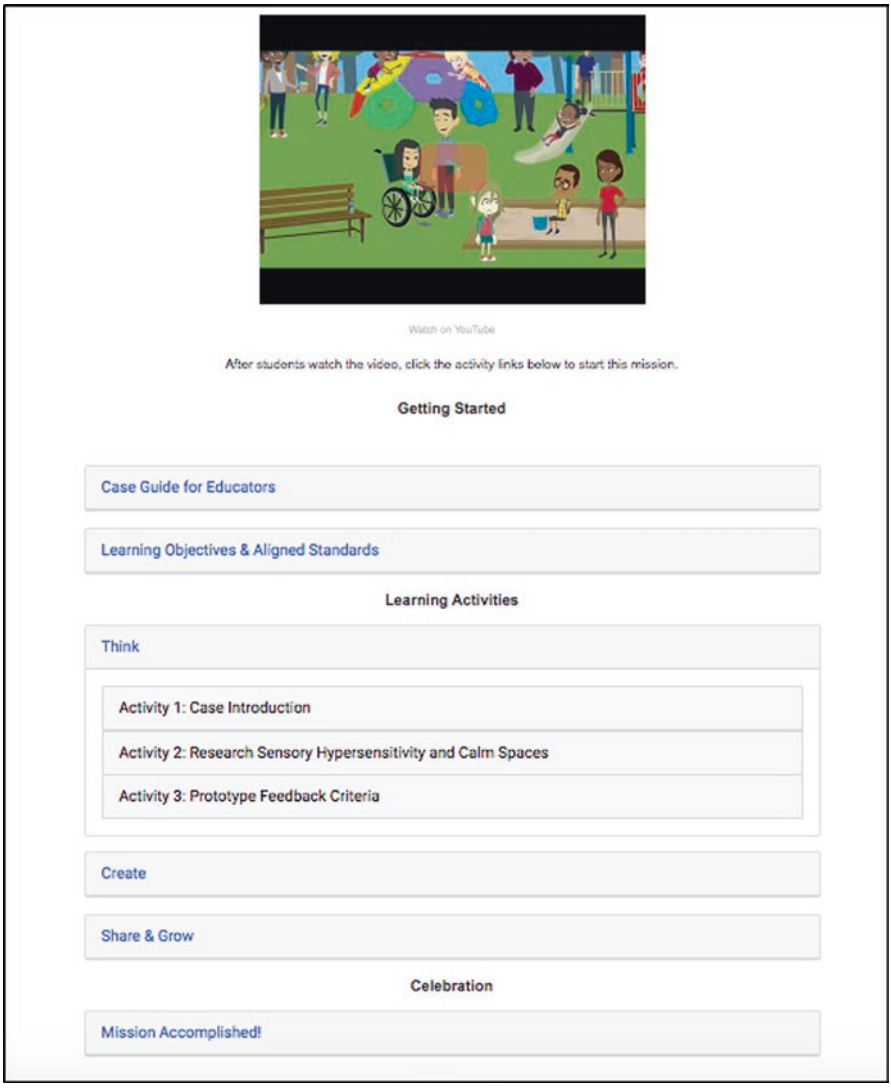

Fig. 4 Librarian view of case menu in EdTech Books showing content segmentation using accordions

calm space for a playground in their community. Figure 5 shows that same case with activities expanded to display a written introduction; suggested materials and set up instructions; a visually-highlighted agent view of activities; and a link that reveals objectives and NGSS and AASL standards.

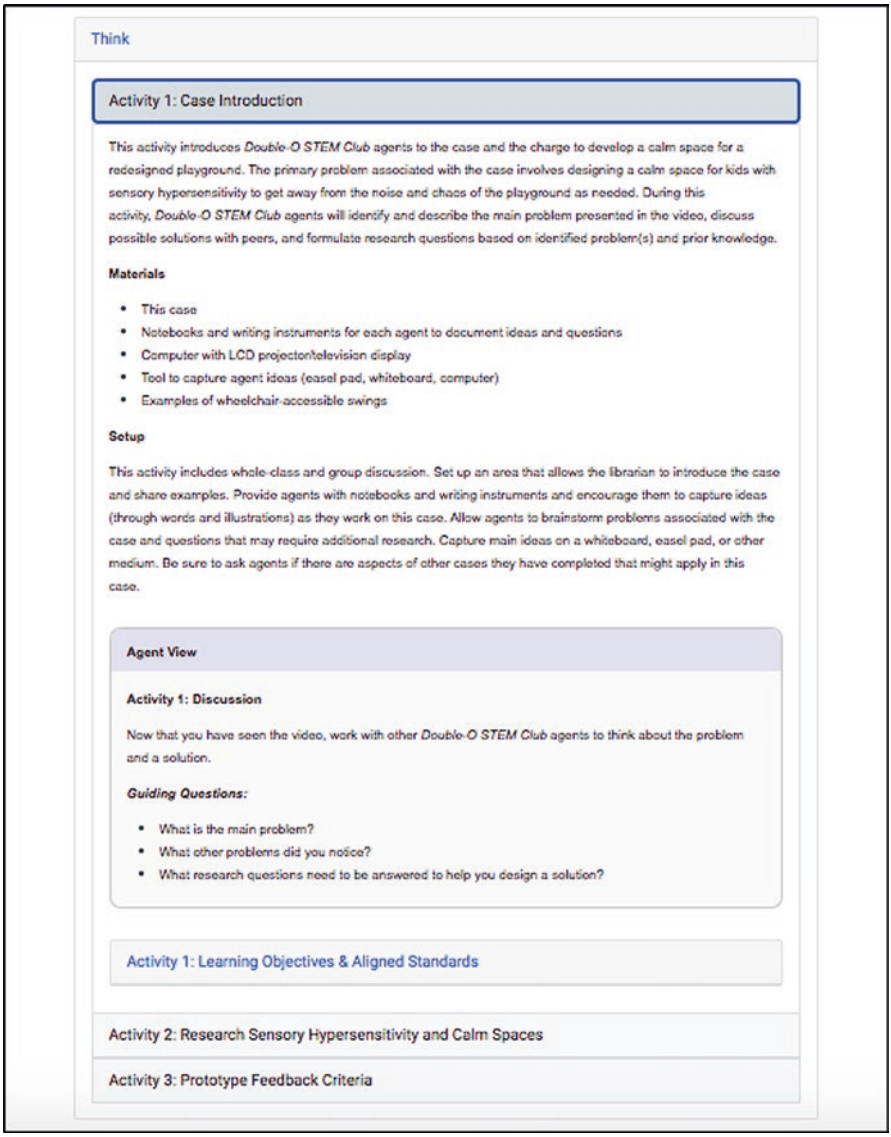

Fig. 5 Librarian view of case activity details in EdTech Books with agent view and link to activity objectives

Design Reflection

Stakeholder Feedback

The design was tested with various librarians (N = 5) who serve as informal educators, which yielded some important insights. A notable comment focused on the intersection of informal instruction, attrition, and design. In the initial version of our

design, we wanted to share an array of 'extension' activities that different libraries could explore. For example, the core problem might ask learners to develop a new bike lane and an extension activity might suggest a micro-bits activity whereby small robotics could be programmed to follow the path. The public librarians instead noted constraints related to attrition, limited preparation, and time allotted for instruction. Whereas before we wanted to ensure they had all the necessary resources in one glance, their feedback caused us to reconsider how to provide the material in a more streamlined fashion. We thus revisited the design and used color codes to decipher what was "core" vs. an "extension" activity to better align our design with the contextual needs of librarians (see Fig. 6)

The feedback also impacted the interaction within the design. Before speaking with the librarians, we broadly categorized activities under three broad categories (Think, Create, Share & Grow), which aligned with the AASL standards. For example, the 'Think' category originally included multiple activities under one long link: question, research food packaging, research eco-friendly materials, survey, and analysis (see Fig. 7). Because we wanted the librarians to focus on a specific activity, we instead changed the interaction so that each activity has its own dedicated link. Another important idea received through feedback focused on sustainability of learning initiatives and the changing role of the librarian. As noted earlier, librarian tasks often consist of varying roles, which makes it difficult to understand the degree to which they emphasize and sustain learning initiatives. They expressed an appreciation that the curriculum was especially designed for the NGSS and AASL standards. They also provided additional areas of improvement to align the design, inquiry tasks, and information seeking. For example, they suggested embedding specific search terms for each activity that learners could employ in the library, which would catalyze the information seeking elements of the engineering task. While we were often focused on the conceptual component of the design, we hope to implement these elements in future versions of the learning environment.

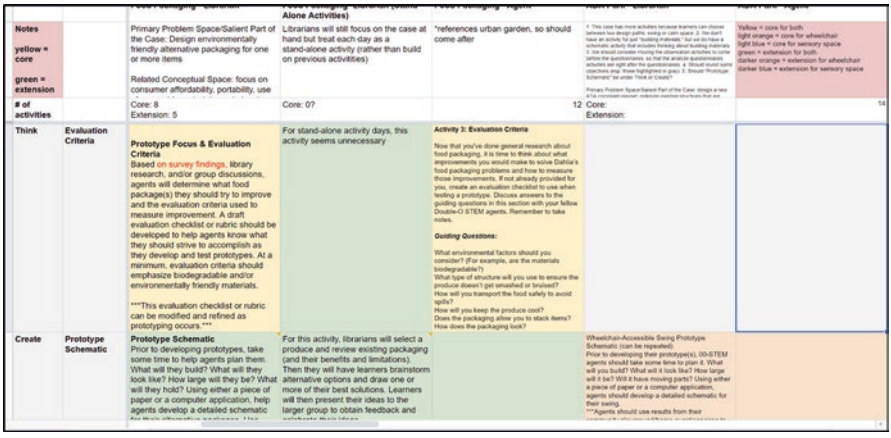

Fig. 6 Color coding to reconsider core vs. extension activity

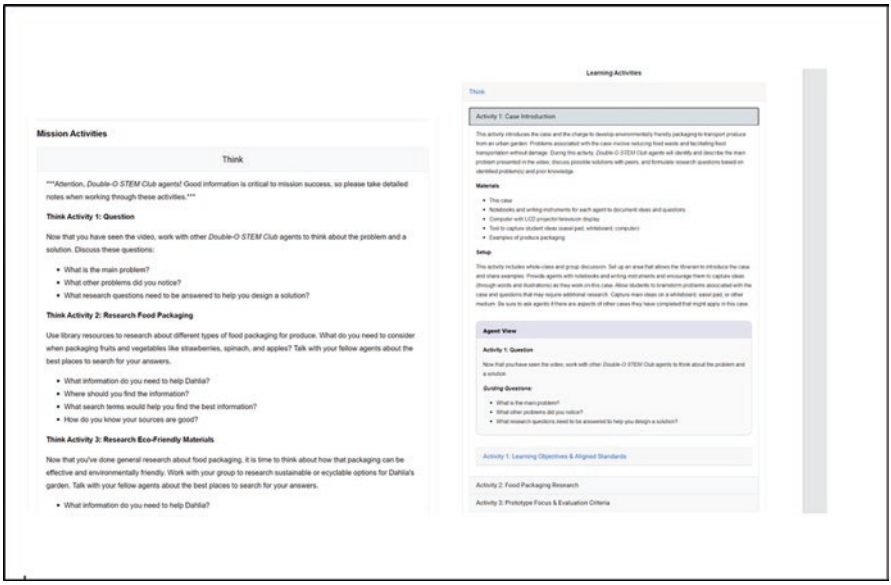

Fig. 7 Before and after of activities and interactions

Future Directions

This case highlights multiple challenges related to designing informal, open-access STEM resources for diverse, public library learning contexts. While many learning resources presume domain expertise or ongoing training with the curriculum, this project could not adopt these assumptions given the informal nature of learning. Rather, designers constantly pivoted to think through the unique skill sets librarians possess, especially in terms of inquiry, and how those could catalyze STEM learning in informal contexts. We considered the unique strengths and expertise of librarians, which we understood to include information-seeking strategies; knowledge of library resources; experience developing and coordinating library programs, oral and written communication skills; and exposure to and understanding of the diverse needs of library users within their communities. It was important to strike a balance between adding an appropriate level of STEM language and detail, along with embedding an appropriate level of scaffolding to set up both learners and librarian facilitators to succeed in working through the proper STEM learning processes.

There were considerable questions about attrition rates, learner's expected prior knowledge, and resources given the informal nature in which learning would take place. To mitigate this issue, the design team worked extensively with our engineering SME to ensure clear and straightforward directions. In the near future, designed cases will be released to a group of public librarians, teachers, parents, and others. Public librarians will review these materials to identify curriculum strengths, areas for improvement, perceptions of the content presented, and opportunities for professional development. Parents and caregivers will review these materials regarding

access, clarity of instructions, ease of entry, learner interest, and successful completion. Given the emphasis on community representation within the cases, the design team highlighted the need to engage in both subject matter expert reviews and user-testing.

Selecting an authoring tool and hosting site presented a design challenge, as well. The appeal of OERs is that they are designed for anyone to use and share. While ideally we could have created a fully interactive, multimedia-rich curriculum using an advanced authoring tool (e.g., Articulate Rise), existing tools often do not allow resources to be publicly shareable or modifiable, and therefore, not OER compatible. However, if educators do not have access to costly authoring tools, the purported OER benefits are largely irrelevant. Indeed, an important element of the design was to construct cases that were representative of a community, but be available for revisions as librarians adapted the material to their specific library settings. This speaks to the need for more open-access authoring tools specifically geared toward learning designers, which would allow for more equitable learning opportunities across diverse contexts.

References

Belland, B. R., & Kim, N. J. (2021). Predicting high school students' argumentation skill using information literacy and trace data. *The Journal of Educational Research, 114*(3), 211–221.

Belland, B. R., Kim, C., & Hannafin, M. J. (2013). A framework for designing scaffolds that improve motivation and cognition. *Educational Psychologist, 48*(4), 243–270.

Blanchard, S., Judy, J., Muller, C., Crawford, R. H., Petrosino, A. J., White, C. K., Lin, F.-A., & Wood, K. L. (2015). Beyond blackboards: Engaging underserved middle school students in engineering. *Journal of Pre-College Engineering Education Research, 5*(1), 1–14.

Bottia, M. C., Mickelson, R. A., Jamil, C., Moniz, K., & Barry, L. (2021). Factors associated with college STEM participation of racially minoritized students: A synthesis of research. *Review of Educational Research, 91*(4), 614–648.

Calabrese Barton, A., Kang, H., Tan, E., O'Neill, T. B., Bautista-Guerra, J., & Brecklin, C. (2013). Crafting a future in science: Tracing middle school girls' identity work over time and space. *American Educational Research Journal, 50*(1), 37–75.

Catsambis, S. (1995). Gender, race, ethnicity, and science education in the middle grades. *Journal of Research in Science Teaching, 32*(3), 243–257. https://doi.org/10.1002/tea.3660320305

Ertmer, P., Glazewski, K. D., Jones, D., Ottenbreit-Leftwich, A., Goktas, Y., Collins, K., & Kocaman, A. (2009). Facilitating technology-enhanced problem-based learning (PBL) in the middle school classroom: An examination of how and why teachers adapt. *Journal of Interactive Learning Research, 20*(1), 35–54.

Glazewski, K. D., & Ertmer, P. A. (2020). Fostering complex problem solving for diverse learners: Engaging an ethos of intentionality toward equitable access. *Educational Technology Research and Development, 68*(2), 679–702.

Houghton, K., Foth, M., & Miller, E. (2013). The continuing relevance of the library as a third place for users and non-users of IT: The case of Canada Bay. *The Australian Library Journal, 62*(1), 27–39.

Hyeon, K. S., Woong, C. G., & Ju, J. Y. (2020). Design principles for transforming making programs into online settings at public libraries. *Information and Learning Sciences, 121*(7/8), 619–630.

Jonassen, D. H. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology Research and Development, 45*(1), 65–94.

Ju, H., & Choi, I. (2017). The role of argumentation in hypothetico-deductive reasoning during problem-based learning in medical education: A conceptual framework. *Interdisciplinary Journal of Problem-Based Learning, 12*(1), 1–17.

Kim, K., Clarianay, R. B., & Kim, Y. (2019). Automatic representation of knowledge structure: enhancing learning through knowledge structure reflection in an online course. *Educational Technology Research and Development, 67*(1), 105–122. https://doi.org/10.1007/s11423-018-9626-6

Kimmons, R. (2021). Shifting to open education in our digital learning. *Educational Technology Research and Development, 69*(1), 379–381.

Lazonder, A., & Harmsen, R. (2016). Meta-analysis of inquiry-based learning: effects of guidance. *Review of Educational Research, 87*(4), 1–38. https://doi.org/10.3102/0034654315627366

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist, 38*(1), 43–52. https://doi.org/10.1207/S15326985EP3801_6

Mouza, C., Marzocchi, A., Pan, Y.-C., & Pollock, L. (2016). Development, implementation, and outcomes of an equitable computer science after-school program: Findings from middle-school students. *Journal of Research on Technology in Education, 48*(2), 84–104.

National Research Council. (2015). Identifying and supporting productive STEM programs in out-of-school settings. The National Academies Press. https://doi.org/10.17226/21740

Nasir, N. S., & Hand, V. M. (2006). Exploring sociocultural perspectives on race, culture, and learning. *Review of Educational Research, 76*(4), 449–475.

Shepherd, C., Kvenild, C., Smith, S. M., & Buss, A. (2017). The unspace case: Developing a maker movement in a multipurpose, flexible space, library setting. *International Journal of Designs for Learning, 8*(1). https://doi.org/10.14434/ijdl.v8i1.22658

Shtivelband, A., Riendeau, L., & Jakubowski, R. (2017). Building upon the STEM movement: Programming recommendations for library professionals. *Children and Libraries*. https://journals.ala.org/index.php/cal/article/view/6510

Sweller, J. (2020). Cognitive load theory and educational technology. *Educational Technology Research and Development, 68*, 1–16. https://doi.org/10.1007/s11423-019-09701-3

Tang, H. (2020). Implementing open educational resources in digital education. *Educational Technology Research and Development, 69*, 389–392.

Tawfik, A. A., Haggerty, K., Vann, S., & Johnson, B. T. (2021). Rethinking the role of the library in an era of inquiry-based learning: Opportunities for interdisciplinary approaches. In B. Hokanson, M. Exter, A. Grincewicz, M. Schmidt, & A. A. Tawfik (Eds.), *Intersections across disciplines: Interdisciplinarity and learning* (pp. 1–11). Springer International Publishing.

Valero Haro, A., Noroozi, O., Biemans, H. J. A., & Mulder, M. (2019). The effects of an online learning environment with worked examples and peer feedback on students' argumentative essay writing and domain-specific knowledge acquisition in the field of biotechnology. *Journal of Biological Education, 53*(4), 390–398.

Woods, S., & Hsu, Y.-C. (2020). Making spaces for STEM in the school library. *TechTrends, 64*(3), 388–394.

Social Justice Math as a Catalyst for Developing Independent Learners and CriticalThinkers in an Urban After-School Math Mentoring Program for Middle School Students

Cassandra Brentley and Carmen Thomas-Browne

In this position paper, we describe the mathematics teaching and learning design of an urban, after-school mathematics mentoring program and how incorporating social justice math (SJM) projects impacts student learning outcomes by providing opportunities to "recognize and interpret inequitable patterns and practices in society" (Hammond, 2020). The Ready to Learn (RTL) program is an after-school math tutoring/mentoring program for middle school students in an urban school district in the Northeast facilitated by a local university. The program consists of two ninety-minute meetings each week. It includes direct mathematics instruction by a university faculty member, who is a former middle and high school math teacher, followed by one-on-one math tutoring from near-peer college students and the personalized adaptive tutor system, Assessment and LEarning in Knowledge Spaces (ALEKS). RTL seeks to address opportunity gaps in math education by providing access to high-quality math instruction, which is often absent in urban school environments (Joseph et al., 2019). The program strives to accomplish this goal through high-quality math tutoring situated within small-group mentoring relationships. Craig et al. (2013) found in their literature review that students who attend after-school programs outperform their peers who do not attend such programs. In fact, they contend that there is evidence of higher performance both in the classroom and on state standardized tests. In addition, they referenced another study of sixth- and seventh-grade students who regularly attended after-school math programs and outperformed their peers by 12 percentile points on standardized tests.

The initial design of RTL focused solely on math tutoring supported by a cognitive tutor math software. Though the initial program design ran smoothly with a central focus on simply solving math problems, the team decided that teaching math

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without a purpose, aim, or direction would prove as futile as it often does in the traditional classroom. Moreover, students of color are often marginalized in the mathematics classrooms and the material is incongruent with their cultures, backgrounds, and ways of being. To approach this discontinuity, the team introduced mathematics projects based on social justice issues that directly impact the world in which the students live. This approach also provided the opportunity for the students to connect the mathematics learned from direct instruction and ALEKS to real-world scenarios that were relatable to them and their lived experiences.

Participants

The participants in the program are sixth-, seventh-, and eighth-grade students who attend the local urban public school district or charter school. The program initially accepted only sixth-grade students, but it scaled up to continue serving participants as they advanced through middle school while adding new students each year. The program now serves all middle school-level students.

Position Statement

Our position is that when students who are most impacted by the opportunity gap, such as Black and Latinx students, are exposed to high-level mathematics instruction through multiple modalities and connect mathematics contexts to topics that are familiar and relevant, student engagement and learning outcomes shift in a positive direction.

Counter Argument

The 2017 National Assessment of Educational Progress (NAEP) statistics report states that students of color are underperforming academically in comparison to their white counterparts, as they have over the past several decades. The NAEP periodically assesses students in Grades 4, 8, and 12 in both public and private schools across the nation. The most recent data from 2017 shows that African American students performed the lowest of all races. For example, in eighth-grade mathematics, student scores by race were White (293), Hispanic (269), Black (260), and Asian (312) (NCES, 2017). The range for eighth-grade math scores is 0–500. Although the scores of all students have increased since the inception of the test in 1990, the gap in scores with regards to race remains. Even when controlled for race in many research studies, students of color still underperform in comparison to their white counterparts.

Some teachers claim to be "color-blind" and imply that all students are exposed to the same teaching and instruction inside of their classrooms. Their claim that all students are exposed to the same material and instruction directly supports *equality* in the classroom, when the goal should be *equity* in the classroom. This mindset suggests that the difference in student learning outcomes based on race must be attributed to something that is owned by the student. Milner (2012) argues that in order to effectively educate "all" students, this type of mindset must be lost.

Argument

The traditional design of education promotes the achievement of white, middle-class students and at the same time promotes the underachievement of students of color (Thompson, 2004). This gap is often referred to as the "achievement gap," but we refer to this gap as the "opportunity" gap. We believe that students of color have not been afforded the opportunity to succeed in mathematics classrooms. We disrupt the notion of terminology such as "achievement gap," which puts the onus on students and embrace the notion of opportunity gap, which acknowledges the contributing factors that hinder the success of minoritized students in mathematics.

To address issues derived from the opportunity gap in mathematics education for students of color, such as the wealth gap, exploring the overarching misalignment between how mathematics is taught in schools in the United States and how mathematics is used in the workplace is also important. We live in a society in which ubiquitous computing is more pervasive and technology is evolving at a rapid pace. Many of the computing and math tasks that students are taught in school are completed by computers in the workplace (Gravemeijer et al., 2017). In the twenty-first Century workplace, instead of solving the problem, we must know how to create the mathematical problem, then enter it into the computer software for the solution. For this reason, it is critical that all students are given the opportunity to perform higher-order thinking that leads to productive struggle (Means & Knapp, 1991; Ritchhart, 2002), which requires confidence as an independent learner.

Research suggests that many racially, ethnically, linguistically, culturally diverse, and economically disadvantaged students tend to be dependent learners. Dependent learners are those who rely on the teacher to carry most of the cognitive load. They often are unsure of how to tackle new tasks and sit passively if stuck, waiting for teacher intervention. Typically, by third grade, students should transition from dependent learners to independent learners, i.e., those who only rely on the teacher to carry some of the cognitive load and possess cognitive strategies to get "unstuck" on difficult tasks (Hammond, 2015). However, for marginalized students, this transition from dependence to independence is often delayed or non-existent. This relationship with learning is not due to the lack of students' skills, but due to learned helplessness that begins as early as pre-K.

In Wahman's (2009) review of Robert Moses' book *Radical Equations: Math Literacy and Civil Rights*, Wahman notes that Moses presents the need for urgent

action around improved math literacy for all students, specifically in algebra, stating "just as the vote was in the Jim Crow South—mathematical literacy is a fundamental requirement for citizenship in the technological era of the twenty-first century" (p. 10). Since students have an inalienable right to high-quality mathematics education, the educational system and all parties involved have a duty to bring this type of teaching and learning to fruition. Having this ideology at the forefront influenced the learning design of the RTL program.

Learning Design

The curricula taught in our schools are written through the lens of the authors, which in most cases are white, middle-class individuals. In RTL, we found that we can capture a deeper value of mathematics. Our goal is to develop the capacity of the learners by increasing their ability to think critically about the world, to reason logically about situations, and to solve real-life problems.

We argue that marginalized students have the capability to perform rigorous math tasks when the learning environment provides mathematics content that is congruent with student backgrounds and relevant to their lived experiences. In essence, marginalized students are hard-pressed to relate to or see themselves in the mathematics being taught. In many cases, marginalized students do not have positive mathematics identities. Martin (2000) describes mathematics identity as how students see themselves as competent learners and doers of mathematics, how they see mathematics as significant, and the motivations they possess to obtain mathematics knowledge.

In the RTL program, we designed the learning experience to combine direct instruction, ALEKS, small group tutoring/mentoring, and SJM projects. The following sections include in-depth descriptions of all the program components.

Direct Instruction

Historically, marginalized students lack exposure to high-quality math instruction. We address this need in the RTL program by providing direct instruction from a faculty member who was a former middle and high school math teacher. The content is selected based on the results of students' assessment for learning through the ALEKS program. The program provides detailed descriptions of the math content that students are ready to learn next, which the instructor uses to create the weekly lessons. Upon completion of the lesson, which is delivered by direct instruction, students are placed into breakout rooms where they work on their individualized learning plan in the ALEKS program. Each mentor is assigned three to four students to support in this process. The students can ask questions of the mentor, and the mentor is trained to provide personalized instruction as needed. Hence, all lessons

are tied to the information provided by the individualized learning paths designed by the ALEKS educational technology.

ALEKS

Because some of the students were technically not proficient in foundational math concepts, we needed a way to address unfinished learning, as well as move students forward. It was decided that a computer adaptive program could potentially address these issues. RTL began by using Mathia, a program developed by researchers at another local university. It was found that although the program could address some of the student needs, it was not easily adaptable to the out-of-school context, as it was designed to supplement a full mathematics curriculum. With this in mind, the team decided to pursue a program that could engage learners and move them forward at individualized rates, which led to the decision to use ALEKS. The ALEKS program assesses students' prior knowledge with an initial knowledge check to determine what students know and are ready to learn next. This information is displayed using a pie format. Figure 1 shows an example of a student's pie. The slices of the pie represent mathematics topics and student progress is color-coded. For RTL, the topics included in the course are selected by the faculty member supporting the program and represented by a white circle in the middle of the pie. "The darker color in the [pie] slices represents topics mastered, the lighter color represents topics learned, and the outer space without color represents the topics remaining to be learned and mastered" (McGraw Hill, 2018).

The ALEKS program is known for its ability to address individual student gaps in math content mastery and to prepare them to move forward in their learning by utilizing Knowledge State Theory (KST) to determine what a student knows, does not know, and is ready to learn next. It also produces this information in the form of a pie chart and a report that is relatively easy for educators to understand and interpret (Craig et al., 2013). Their study included students in an after-school math program divided into two groups, one that was taught by certified teachers and one where students used only ALEKS for learning. They found that the students who

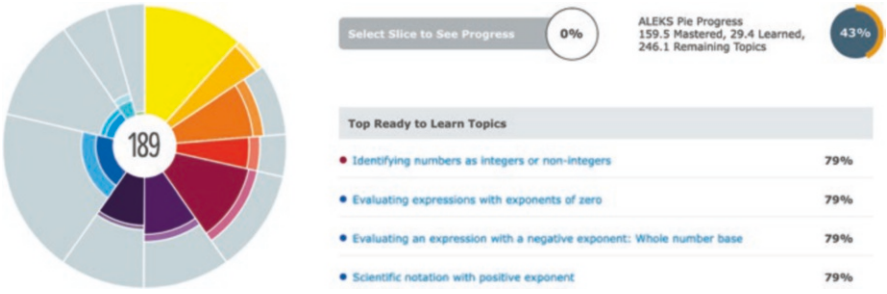

Fig. 1 ALEKS personalized pie example

only used ALEKS for their learning performed at the same rate as those who had a teacher for direct instruction. These findings indicate that the program has the potential to be effective without the presence of a teacher. This is a positive indication for the ways in which such a program can be used to enhance the learning experience of students. Huang et al. (2016) state that intelligent tutoring systems (ITS) have shown higher gains with groups that use ITS compared to those who received large-group, teacher-led instruction. The results mirror those of students who received one-on-one human tutoring. They even posit that ITS can level the playing field between students from higher SES, who attend high-achieving and highly resourced schools and students from lower SES, who attend low-achieving, under-resourced schools. In essence, this approach is one way to address the opportunity gap that often exists for students from under-resourced, urban schools. This tool is one of the strategies used in RTL to build the capacity of students to aid in the process of shifting them from being a dependent math learner to an independent math learner. The work in ALEKS is tied to the work of the mentor-tutors. In this virtual, breakout room space, mentors can support students with their work on ALEKS in a small group environment.

Small Group Mentoring/Tutoring

A key tenet of Culturally Responsive Teaching is making connections and forming relationships with students. Gloria Ladson-Billings (2009) emphasizes this in her book called, *The Dream-Keepers: Successful Teachers of African American Children*. She notes that successful teachers who strive to teach in culturally responsive ways seek to make connections with their students and encourage them to make connections with each other. This pedagogical approach contributes to a healthy environment for learning. The RTL program promotes this relationship-building between the students and mentor-tutors. This relationship-building occurs in the breakout rooms where mentor-tutors support students in their individualized component of the learning design.

Social Justice Math

The math that is learned through direct instruction, ALEKS, and one-on-one support in the mentoring sessions is applied to real and relevant SJM projects. The students can use the math learned in a real way to think critically about a problem of concern in their lives, communities, or the world. The SJM projects are a culmination of all of the math skills that are built through the multiple learning modalities.

SJM presents an opportunity to address the needs of marginalized students and outdated mathematics instruction by making math accessible and relevant to students. There are many benefits of teaching mathematics for social justice,

including a curriculum that centers the experiences of marginalized students, using mathematics not only critically to analyze issues of power within society, such as systemic oppression, but also as a tool for change (Gonzalez, 2009). Thus, we introduced SJM projects co-created by the RTL staff and some adopted or modified from other sources. The middle school students worked on with guidance from their mentor-tutors to apply the mathematics that was taught in ways that makes "real" sense and addresses "real" problems. SJM creates inclusive learning opportunities through interdisciplinary connections that are both culturally relevant and personalized. Leonard et al. (2010) state that mathematics is a cultural experience and that teaching mathematics from a social justice perspective can help to form positive mathematics identities and allow students to engage in mathematics in meaningful ways. In essence, RTL provides students opportunities to become critical thinkers about their lives, communities, and society at large, in addition to examining and sometimes pushing back on practices that elevate some and oppress others.

This inclusive learning design provides access for marginalized students to engage with math in meaningful ways. Kokka (2015) offers a definition of SJM grounded in three main principles, suggesting (a) that teachers and students use SJM to empower marginalized groups of people; (b) that SJM creates opportunities for rigorous and active math learning, especially for historically marginalized learners; and (c) SJM learning experiences are co-constructed, and power is shared between the teacher and the learner. The negotiation of power between the students and the teacher is a critical component in creating learning spaces that allow students to evolve into independent learners. As Hammond (2015) suggests, the learning environment is critical to creating a "culturally responsive community for learning" that offers a sense of safety and support, especially for dependent learners who are building their confidence and strengthening their math identity (p. 19).

We utilized and modified social justice projects from a variety of sources including the *Rethinking Mathematics* text. Some of the project topics were examining the suspension rates of minoritized students in comparison to the suspension rates of students from the dominant culture in local schools, examining the COVID-19 vaccination rates in people of color, examining the disproportionate numbers and deadly impact of COVID-19 on people of color, and examining the wages of workers at fast-food chains in comparison to the wages of the CEOs at these companies, just to name a few.

Learning for Justice, formerly *Teaching Tolerance*, an initiative of the Southern Poverty Law Center, authored and published Social Justice Standards that serve as a framework for anti-bias education. In our work, we saw a direct connection to what was learned in the SJM projects and these standards. The Social Justice Standards have four domains: Justice, Action, Identity, and Diversity. The domains are broken into grade-level bands: K-2, 3–5, 6–8, and 9–12. We focused on Grades 6–8 standards, since our students are middle school students. Table 1 illustrates some of the SJM project types and the Social Justice Standards that they address.

Table 1 SJM projects and the Anchor Standard addressed

Anchor standards		
SJM projects	Justice	Action
School Suspensions	Justice 11 **JU.6–8.12** I can recognize and describe unfairness and injustice in many forms including attitudes, speech, behaviors, practices, and laws.	
Wage Inequality	Justice 11 **JU.6–8.12** I can recognize and describe unfairness and injustice in many forms including attitudes, speech, behaviors, practices, and laws.	
Coronavirus Disparities		Action 16 **AC.6–8.16** I am concerned about how people (including myself) are treated and feel for people when they are excluded or mistreated because of their identities.
Labor Exploitation		Action 20 **AC.6–8.20** I will work with friends, family, and community members to make our world fairer for everyone, and we will plan and coordinate our actions to achieve our goals.

Implications for Research and Practice

The learning design of RTL can be used as a model to design other after-school or out-of-school time programs. It takes into consideration the student audience, learning conditions and design, and other factors that plague the teaching and learning environments of marginalized students. It would be advantageous to collect data for comparison and analysis of other out-of-school time experiences.

Conclusion

The Ready to Learn program (RTL) creates a bridge between the historically misaligned math instructional practices for students in urban contexts by giving students access to high-quality math instruction and tutors that support their development as critical thinkers and independent learners. Through blending social justice math, AI tutors, and human tutors, RTL creates a personalized learning experience that connects real-world social justice issues to math concepts and provides students with tools to critically examine their world. This work can serve as a model

for out-of-school-time math enrichment programs that seek to close the opportunity gap and increase student self-efficacy and competence as "learners and doers" of mathematics. In addition, this work can serve as a model for in-school math experiences that out-of-school time programs can adopt to make the mathematics learning experience more meaningful for marginalized students, as well as increase engagement and achievement. This work echoes Dr. Bettina Love's (2020) We Cannot Go Back to the Way Things Were. As students return to the classroom, teachers in many urban schools that previously did not have a one-to-one device program will now find themselves tasked with learning how to effectively incorporate software into their instruction. The blending of ALEKS with interdisciplinary SJM provides a highly effective model that can be duplicated in the post-pandemic classroom.

References

Craig, S. D., Xiangen, H., Graesser, A. C., Bargagliotti, A. E., Sterbinsky, A., Cheney, K. R., & Okwumabua, T. (2013). The impact of a technology-based mathematics after-school program using ALEKS on student's knowledge and behaviors. *Computers & Education, 68*, 495–504.

Gonzalez, L. (2009). Teaching mathematics for social justice: Reflections on a community of practice for urban high school mathematics teachers. *Journal of Urban Mathematics Education, 2*(1), 22–51. Retrieved from http://education.gsu.edu/JUME

Gravemeijer, K., Stephan, M., Julie, C., Lin, F.-L., & Ohtani, M. (2017). What mathematics education may prepare students for the society of the future? *International Journal of Science and Mathematics Education, 15*(1), 105–123.

Hammond, Z. (2015). *Culturally responsive teaching and the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students*. Corwin, a SAGE company.

Hammond, Z. (2020). *Getting to equity means getting students ready for rigor*. Retrieved April 10, 2021, from https://crebydesign.com/

Huang, X., Craig, S. D., Xie, J., Graesser, A., & Xiangen, H. (2016). Intelligent tutoring systems work as a math gap reducer in 6th grade after-school program. *Learning and Individual Differences, 47*, 258–265.

Joseph, N. M., Hailu, M. F., & Matthews, J. S. (2019). Normalizing black girls' humanity in mathematics classrooms. *Harvard Educational Review, 89*(1), 132–155.

Kokka, K. (2015). Addressing dilemmas of social justice mathematics through collaboration of students, educators, and researchers. *Educational Considerations, 43*(1), 13–21.

Ladson-Billings, G. (2009). *The dream-keepers: Successful teachers of African American children*. Jossey-Bass.

Leonard, J., Brooks, W., Barnes-Johnson, J., & Berry, R. Q., III. (2010). The nuances and complexities of teaching mathematics for cultural relevance and social justice. *Journal of Teacher Education, 61*(3), 261–270.

Love, B. L. (2020, December 3). Teachers, we cannot go Back to the way things were (opinion). *Education week*. Retrieved from: https://www.edweek.org/leadership/opinion-teachers-we-cannot-go-back-to-the-way-things-were/2020/04

Martin, D. B. (2000). *Mathematics success and failure among African American youth: The roles of sociohistorical context, community forces, school influence, and individual agency*. Lawrence Erlbaum.

McGraw Hill LLC. (2018). *ALEKS support. McGraw Hill ALEKS support*. Retrieved April 11, 2021, from https://mhedu.force.com/aleks/s/article/What-is-the-ALEKS-Pie?dc

Means, B., & Knapp, M. S. (1991). Rethinking teaching for disadvantaged students. In B. Means, C. Chelemer, & M. S. Knapp (Eds.), *Teaching advanced skills to at-risk students: Views from research and practice* (pp. 1–26). Jossey-Bass.

Milner, R. H. (2012). Losing the color-blind mindset in the urban classroom. *Urban Education, 47*(5), 868–875.

National Center for Education Statistics (NCES). (2017). *National Assessment of educational Progress: An overview of NAEP*. National Center for Education Statistics, Institute of Education Sciences, U.S. Dept. of Education.

Ritchhart, R. (2002). *Intellectual character: What it is, why it matters, and how to get it*. Jossey-Bass.

Thompson, G. L. (2004). *Through ebony eyes: What teachers need to know but are afraid to ask about African American students*. Jossey-Bass.

Wahman, J. T. (2009). "Fleshing out consensus": Radical pragmatism, civil rights, and the algebra project. *Education and Culture, 25*(1), 7–16.

Trajectories of Student Engagement with Social Justice-Informed Design Work

Colin M. Gray, Rua M. Williams, Paul C. Parsons, Austin L. Toombs, and Abbee Westbrook

Design educators and practitioners are increasingly interested in supporting social justice through their design work, often framed around intersectional concerns of power, privilege, and citizenship (Costanza-Chock, 2020). The ideas behind social justice are not new, but are increasingly resonant and common in design discourses that focus on political dimensions of design work (e.g., Costanza-Chock, 2020; Dombrowski et al., 2016). In the instructional design (ID) community, discussions of ethics and social responsibility have rarely been addressed (Boling & Gray, 2015; Gray & Boling, 2016), even while there is incipient interest in social justice-informed ID work (Bradshaw, 2018). Beyond ID, scholars have described challenges and opportunities when engaging students in social-justice informed outcomes. As an example of these challenges, in a study by Mayhew and Fernández (2007), pedagogical strategies that took a societal systematic approach were more successful, but issues such as the presence of diverse peers, pedagogical framings, and opportunities for dialogic engagement mediated the uptake of social justice capacity.

In our context of higher education at a large Midwestern research-intensive university, we have sought to educate user experience (UX) design students in relation to multiple philosophies of design, including user-centered and human-centered design, critical design, participatory design, co-creation, feminist design, and social justice-oriented design. In our second studio of a five studio sequence, we ask students to engage in co-creation work with the goal that their project outcomes will support and empower citizens to organize and effect change on their own terms—a framing of design work known as *digital civics* (Olivier & Wright, 2015; Vlachokyriakos et al., 2016). Digital civics as a design philosophy is framed around an explicit rhetorical pivot from traditional or even human-centered philosophies of design: "We should stop designing for consumers and start designing for citizens" (Olivier & Wright, 2015, p. 61). This pivot values outcomes that exceed production of profit, relating to wellbeing, cultural value, and the ability of everyday citizens to fully participate in the systems through which they live, work, and develop. While

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it is outside of the scope of this submission, it is important to note that this focus on "citizens" instead of consumers does not necessarily address critical questions around who has access to citizenship or who can fully participate in society in empowered ways.

Purpose of the Research

Building on this alternative framing of design and technology engagement, in this chapter we describe how UX design students become aware of citizen-engaged design work, and indicate the extent to which a progression toward social justice-focused design work might be possible in a single project cycle. We seek to answer two research questions:

1. What issues did students identify as they sought to engage citizens, and how were these issues framed as digital civics work?
2. How did students engage with social justice-focused design philosophies throughout their design process?

Method

We analyzed 3 years of digital civics-focused project work (2018 n = 6 groups; 2019 n = 7; 2020 n = 8) undertaken by students in groups of five over a seven-week period, representing the work of 100 students over 3 years of this course offering. These projects were undertaken in a sophomore-level UX design studio at a large Midwestern US university—part of a five-semester sequence in which students engage in a range of projects that address competence in user research, prototyping, and evaluation (Gray et al. 2020a, b). These students represent relatively diverse perspectives, with a majority of the population identifying as female and a number of international students. At this point in the program, students have already spent one semester together as a cohort in a previous studio where they were exposed to user-centered design principles, group project design work, and the processes of problem re-framing and pivoting (cf., Dorst 2015) based on studio critique and formative feedback. The project cycle we focus on in this paper is the first in our multi-studio sequence (Gray et al. 2020b) which directly challenges the apolitical framing in most foundational UX methods literature, explicitly asking students to engage with issues of power disparities. The project brief was as follows:

> In this project, your goal is to create a responsive web experience that creates, extends, or otherwise builds on grassroots efforts in a local community context. This outcome should be framed within the digital civics approach, empowering local citizens to address local issues, and/or become more aware of community events or initiatives in ways that exceed a

> standard informational website. You will engage in research to identify existing local community and technology resources that might impact how you build and sustain involvement in the local community. This knowledge will guide the creation of an interactive web experience that addresses a specific community issue.

Context and Data Sources

In the 2018 version of the course, the project focused on engaging and supporting existing organizations, while in 2019 and 2020, the project focused on creating affinity among citizens—centered on the students' understanding of issues of inequity in their local university context—with the goal of empowering that group to effect change. We focus on final documentation of these projects as our primary data source, but also rely upon our lived experience of the creation, critique, and presentation of these outcomes. We also use other sources to triangulate and verify our reflections. Secondary data sources include: one two-hour group critique event per year and two formal presentation sessions (4–6 minute presentations/team) of project outcomes per year, and weekly written reflections by all students.

Author Positionality

As authors, we believe it is important to be reflexive and transparent about our engagement with these project outcomes (Maxwell, 2004), and are mindful to include multiple perspectives on this experience. Colin is the lead instructor of this course and has taught five cohorts of students since 2016. Paul and Rua have served as co-instructors (in 2016 and 2020), and Austin has postdoctoral training in digital civics-focused work. Abbee experienced this course first as a student in 2018, and then as a mentor and critique participant in the 2019 and 2020 offerings of the course. Several of the authors have embraced critical epistemologies as central to their research work, with Colin and Austin taking on perspectives from second wave critical theory and Rua building their research work in relation to critical disability studies. All authors have sought to focus attention on the political and normative nature of design (cf., Costanza-Chock, 2020), and have engaged with these perspectives as part of their teaching philosophy. In this chapter, we build upon numerous informal conversations we have had over the past 5 years in relation to this project cycle and expected student outcomes, while also building upon a study abroad experience we have supported in the United Kingdom that shares an explicit focus on digital civics engagement (Gray et al., 2019).

Analysis Approach

As researchers, we focused our analysis on students' engagement with civics-oriented work in two different ways. Our analysis was auto-ethnographic in approach (cf., Coia & Taylor, 2009), building on our diverse perspectives and experiences as instructors while also recognizing student experiences relating to these project outcomes. To support this auto-ethnographic inquiry, we relied both on our informal conversations and reflections on project outcomes over the last 5 years with varying combinations of the authors, and on a series of Zoom calls with all authors where we reflected on project outcomes and past course experiences—with the conversations functioning as researcher memos (Birks et al. 2008; Carspecken, 1996). Through these conversations, we engaged in two core analytic activities. First, we used reflexively-focused bottom-up thematic analysis (Braun & Clarke, 2019; Brulé, 2020) to describe how students sought to identify stakeholders and engage citizens, implicitly and explicitly engaging with civics-focused framings of co-design engagement and final outcomes. Here, our focus was on characterizing more and less successful team engagements with social justice issues both in relation to outcomes and over time. The outcome of this analysis is reported in the first findings section. Second, we mapped a range of trajectories of student engagement with social justice-focused design philosophies (e.g., Costanza-Chock, 2020; Dombrowski et al., 2016), highlighting cases where students were able to successfully pivot or re-frame the design situation in ways that were consistent with the digital civics philosophy of engagement, addressing goals of participation and advocacy, as well as cases where students tended to repeat common solutionist framings of work within an apolitical or product-focused human-centered philosophy. The outcome of this analysis is reported in Fig. 3.

Findings

We present findings across these civics-focused projects from three offerings of a studio course from 2018–2020, building on our collective interpretations of the groups' final outcomes and contextualized by our experiences of critiques and other student interactions that shaped these outcomes.

How Were Identified Issues Framed as Digital Civics Work?

Student teams engaged in a wide range of issues that they felt impacted the local community (in 2018) or impacted the student experience (2019 and 2020). Across the 21 student projects, sample areas of focus included: food (2), interpersonal support (6), sustainability (1), volunteerism (2), student club engagement (2), inclusivity and equity (5), and education (1). In 2018, the team's focus was defined

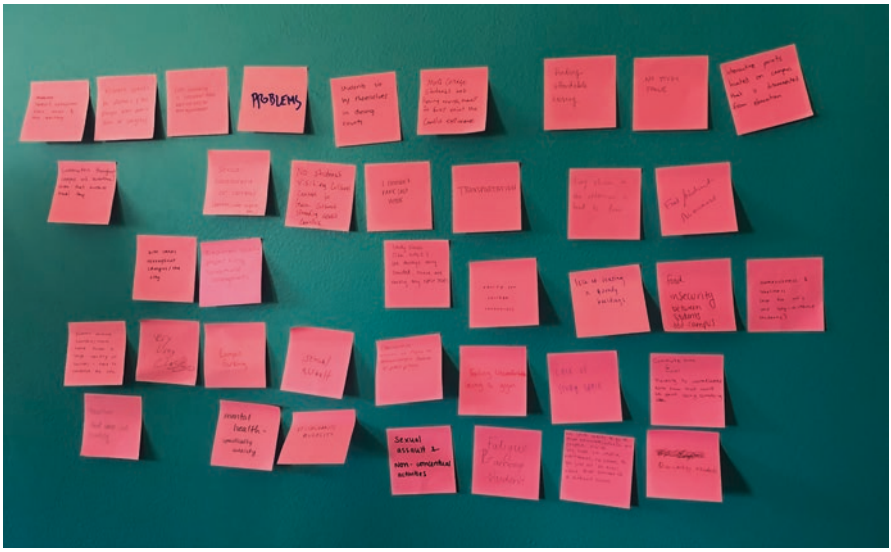

Fig. 1 Examples of student brainstorming on problems within the local student community that they could address with their projects. These problems were used to align concerns and form student teams

in relation to an existing community partner, while in the later years, students could pick any issue of interest to them that impacted the local student experience (Fig. 1).

The ability of student teams to frame and re-frame was critical to their success in building the possibility for participation among stakeholders while also recognizing the complexity of the problem spaces in which they worked. For instance, the teams that initially focused on enhancing engagement within existing student clubs or areas of interest—encouraging volunteerism on the campus farm or increasing engagement among marijuana activists—generally never questioned that initial frame. This acceptance of a default given frame was particularly problematic in 2018, because they were working on behalf of an existing group that told them what problems they should focus on. In contrast, other teams reframed their chosen context, with some shifts or pivots happening quite late in the project cycle. As one especially impactful example of this willingness to pivot, the "Drunk Toolbox" team spent over three-quarters of their time focusing on compliance issues related to fraternity and sorority members' use of alcohol, as inspired by their interactions with the Dean of Students (Fig. 2). Late in the project cycle, they moved away from making the compliance training experience better, and instead created an easily installable web app that allowed students with diminished capacity to make responsible decisions to get help for their drunk peers, as allowed under state statute. We view this as a successful pivot in the project cycle, because the student team transitioned away from only a neoliberal interpretation of the compliance issues framed around institutional liability, instead seeking to support the role of student agency and address structural norms that may discourage action in helping their fellow students in complex situations.

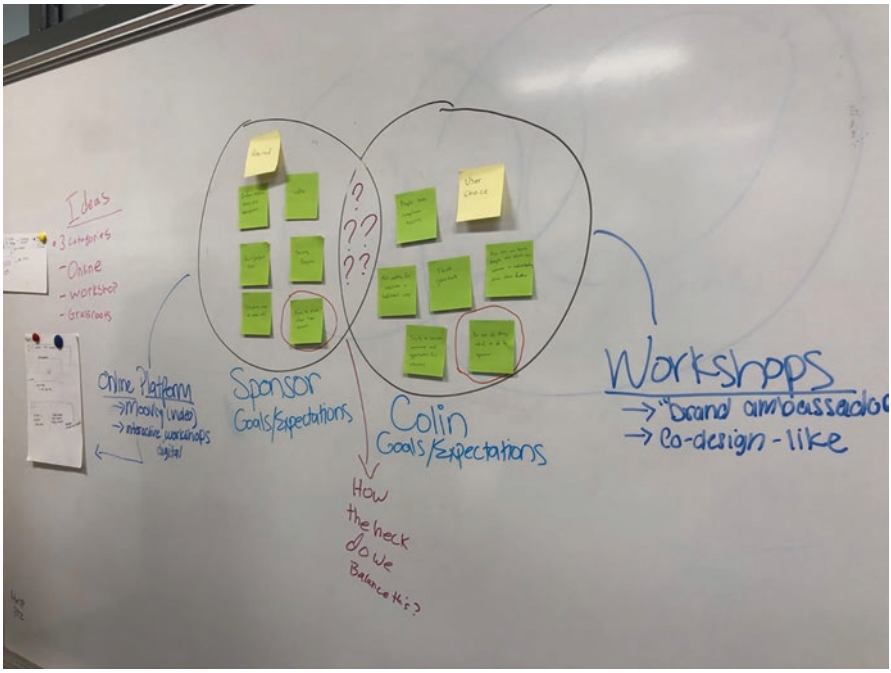

Fig. 2 A whiteboard sketch of a Venn diagram illustrating the Drunk Toolbox team's frustration with competing stakeholder framings of the problem in a group critique that led to their successful pivot

The sketch in Fig. 2 was part of a formative group critique where the project team had to decide whether to accept an apolitical framing focused on the desires of administrative stakeholders or to address the complexity of the problem as felt by students—stated in the whiteboard sketch as "How the heck do we balance this?"

While engagement with local community partners or stakeholders was critical for all projects, the invitation to participate (often through co-design sessions) was uneven in execution, and even teams that were successful in running co-design sessions with appropriate stakeholders did not always result in appropriate design outcomes. For instance, Abbee's team that focused on a secondary education context was highly successful in establishing contact with a local "school court" that managed minor disciplinary issues. They were able to observe the context multiple times, and conducted a well-crafted set of co-design activities with a range of student and staff stakeholders. However, these insights did not lead to successful design outcomes, since the team was uncertain how to map their relatively rich understanding of the context to possible technological interventions that could potentially be deployed. In a different example demonstrating unexpectedly successful design outcomes in light of weak co-design engagement, another team focused on supporting the gym experiences of students identifying as female. While

their early engagement work focused primarily on developing exercise skills and coping mechanisms to counter the male domination of the gym environment, their eventual solution—a flash mob to "take back the gym"—demonstrated the team's willingness to move beyond a relatively flat initial engagement with stakeholders and identify new ways to counter systemic forces of oppression. In a final example demonstrating a missed opportunity for engagement building on initial stakeholder engagement, another team sought to encourage professors' development of social norms to help LGBTQ+ students feel more included in the classroom. While early student engagement with the LGBTQ center on campus and queer students was relatively successful, the team was unable to build on these insights to see the problem as something other than educational. This challenge was paradoxical, since both of the instructors for the course that semester were queer, and while the instructors provided multiple potential entry points to the underlying equity problem, the students were unable to connect their initial community engagement with appropriate design outcomes.

How Did Students Engage with Social Justice-Focused Design Philosophies?

There was broad diversity in how student teams sought to engage stakeholders in the context of their project goals, how they framed and chose to act upon concerns that emerged through co-design engagement, and how they oriented design outcomes in relation to their understanding of key social justice commitments. In this section, we describe a set of frames of justice consciousness (Fig. 3) that we as a research team constructed to better understand and describe the team interactions and outcomes we observed over multiple years, illustrating some of the frames and trajectories that were taken on by student teams.

In this initial visual outline of their website (Fig. 4), the team sought to help students feel that they could participate in organizing that leveraged their collective outrage, with the interactive components revealing ways they could sign up to create a portion of the Purdue Bell Tower through physical pieces formed from compressed dining waste.

The "Radical Little Trash Babies": From Neoliberal Theatre to Civics Competent

At the height of the pandemic in Fall of 2020, a team sought to explore the problem space of sustainable waste on campus. This group of students was disappointed to see how trash from the dining halls "regressed" under COVID-19 restrictions; there were no longer structural supports for reusing containers, so the team wanted to enable students to better engage in recycling practices to help them manage their

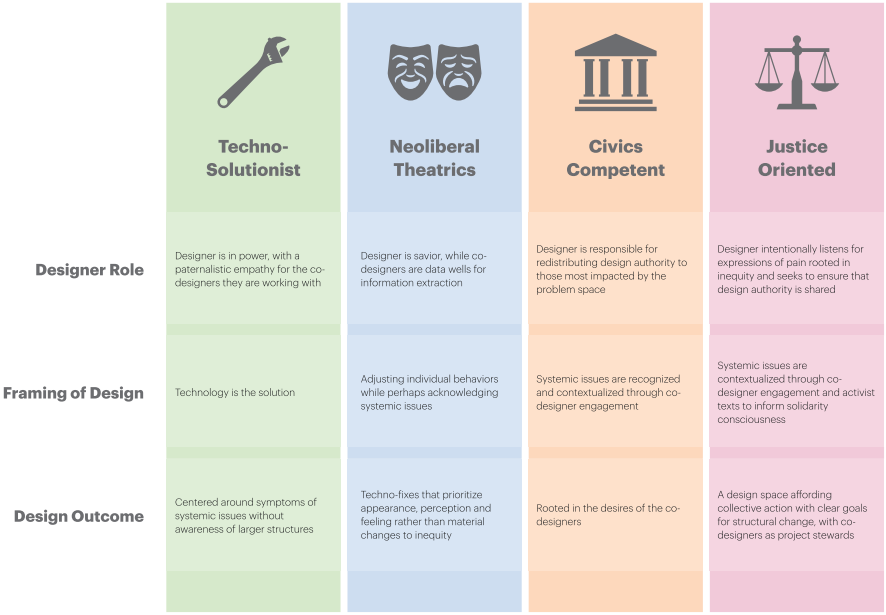

Fig. 3 Frames for Justice Consciousness model resulting from our reflection on course experiences and student outcomes over a three-year period. This model is available as an open educational resource (Gray et al., 2021)

increased plastic waste. This collective outrage built upon an article in the student newspaper that highlighted the increase in waste, which was also reflected in the students' own experiences of on-campus dining. Their initial ideation centered around education of the student body about how to reduce the amount of plastic waste they accumulate, and how to recycle the waste they do use.

Through critique sessions, instructors challenged this team to reassess their perceptions of student agency and knowledge. Was it really true that students did not know how to recycle? Or was there a lack of recycling infrastructure on campus? Were students actually able to reduce their plastic waste through individual behaviors? Or was that plastic waste outside of their control, and at the discretion of dining hall management? The team took these critical reframings to heart—owning for themselves a phrase Rua playfully used in a critique session of "radical little trash babies"—transitioning their efforts away from an education campaign, one that hinged on neoliberal conceits about individual behavior within systems of disenfranchisement, toward a collective action campaign that empowered students to turn their plastic waste into a monument of protest against unsustainable administrative policies (Fig. 4).

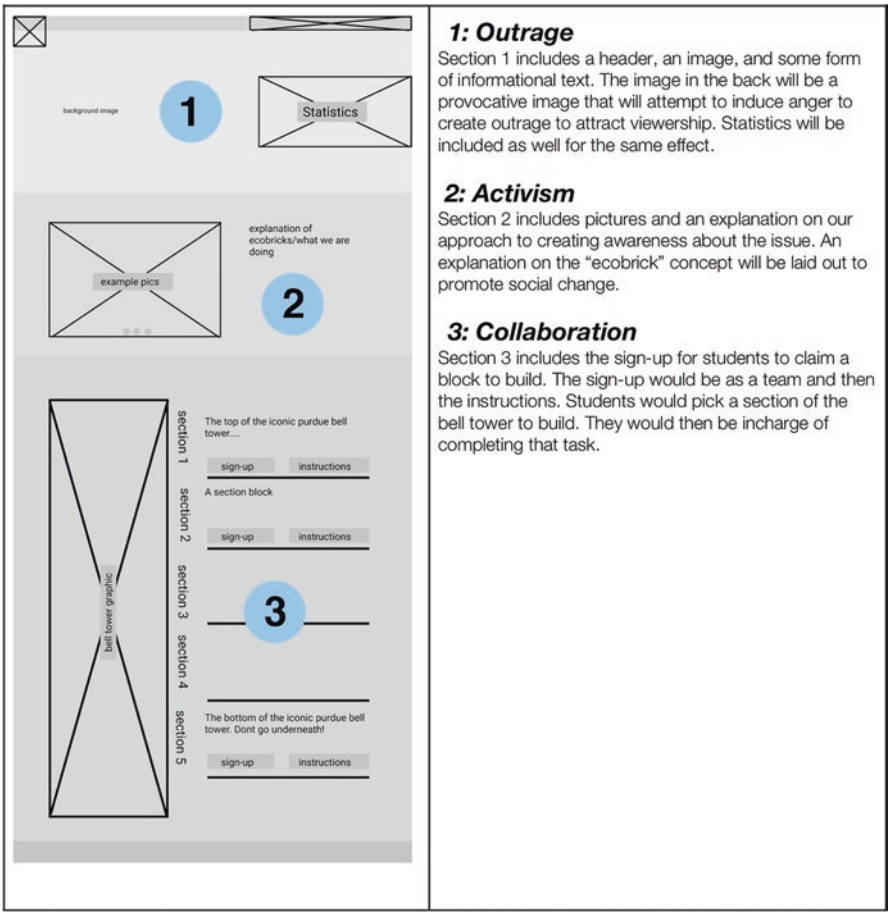

Fig. 4 Wireframes for the student team's final website that shifted from individual responsibility to collective activism

Building LGBTQ+ Belonging: Sometimes Crit Doesn't Take

That same semester, another student team sought to engage with the problem space of LGBTQ+ students' sense of belonging on campus. Their first ideas revolved around LGBTQ+ student advocacy and education of campus faculty. All members of the group were allies or identified as LGBTQ+, and one team member also had extensive training and engagement in an LGBTQ+ center. During an early crit, the instructors, who were each members of the LGBTQ+ community themselves, reminded the team that faculty already receive training on LGBTQ+ inclusion, that

lack of education is not the reason why some faculty remain hostile to queer students, and that queer faculty, staff, and students have opportunities to form coalitions for campus climate changes that support all queer people on campus.

Unfortunately, the team was unable to integrate this critique into their design ideation, and their project actually backslid from the theatrics of student advocacy to a techno-solutionist and extensive learning platform for LGBTQ+ sensitivity training that effectively replicated the minimal training faculty already receive. While from an instructional perspective we do not wish for students to position crits as "demands" for specific design changes, in this project we did hope to help the team see how their design trajectory and framing could change. Even in a team like this that was already inspired towards activism, it was essential to empower them to explore divergent design paths while also identifying any sources of student resistance to engagement with the broader civics goals of the project.

Finding the Practical Limitations of Student Engagement Projects

When Abbee worked on this project, her team was passionate about creating an empowering intervention for a local organization, but found their progress hindered, or frozen, by a lack of confidence in their ability to create a technical prototype. Abbee reflected about her experience:

> Our lack of ability in creating a deliverable for School Court caused us to freeze. We had spent so much time collecting data around the group but we let our lack of competency in building a website default us into creating a solution that barely fit the needs of the group. As a group, we felt it would be better to play it safe and produce something that worked—an information vehicle—rather than produce something that would lead to shifts in the group's power dynamics. When working with our community partner, I felt so strongly that failure was not an option that I became risk averse. In my mind, my community partner was putting much more on the line than I was. The organization was allowing me to come into their environment, work with members of their community, and use their time and resources. I felt an immense sense of responsibility to make all of the organization's vulnerability worth it.

A potential reframing of the role that a prototype from this team could play for the community sponsor may have helped the team shift to a different perspective about their responsibility to that community sponsor.

Discussion and Implications

Across the projects through these 3 years, we can see how it is possible for student teams to approach the project with different levels of justice-focused awareness and end the projects with more or less sophisticated outcomes. Many of the outcomes

which were less successful, whether the teams approached the original framing of the project from a justice-focused perspective or not, are a result of some combination of: (1) an inability for the team to map what they learned through their co-design engagements to the potential solution space; (2) "deadline panic," resulting in an unceremoniously wrapped up project with little to no critical engagement; and (3) a lack of technical knowledge combined with a misunderstanding of the role that technical prototypes should play in the process, leaving students to limit their design proposals to reflect their personal and often deficient technical competencies. All of these challenges reveal different potential barriers to success. Some challenges relate primarily to student capacity or incoming competence, while other challenges relate to instructional scaffolding or the purposeful tensions that are designed into the narrative arc of our program (Gray et al., 2020a, b). No instructional environment can adequately address the different constellation of challenges experienced by each project team or team member—particularly within the short time frame of this project which includes quite lofty goals for both social justice and technical competence—but we have found value in reflecting on the trajectories identified to better understand characteristic barriers that may result in changes to the types of critique given or instructional scaffolds provided.

In reflecting upon these outcomes, it is almost expected that students will start in a naïve space, failing to recognize the systemic forces that reproduce inequity. And indeed, this naïve state is reinforced by the depoliticization of design work that is typical in commercial applications of "design thinking" and user-centered design (Kolko, 2018; Irani, 2018)—something which our program seeks to actively disrupt. While not the focus of our analysis, we have observed the productive value of critique in shifting some teams' perspectives and outcomes, although we also note that formative critique and indication of key deficiencies in engaging with justice issues alone did not consistently result in the teams' reframing of the problem to become more civics focused. However, as part of a broader curricular arc (Gray et al., 2020b), these design failures still serve as precedent for thoughtful and politically-aware engagement in future projects. Even in cases where groups regressed, moving from more civics-focused frames to less civics-focused frames, this regression has been productive (cf., Gray et al., 2020a) *as long as* those groups are able to recognize and reflect on why that became the case (e.g., inability to map lessons learned from their engagements to the solution-space, or inability to engage more thoughtfully with potential solutions due to lack of technical understanding). Thus, our implications for further pedagogical and research engagement point not only to the success of a particular civics-focused project, but also in broader thresholds that students may be encountering and passing through; for instance:

- Recognizing the role of co-design in enabling stakeholders to address their own problems, not merely as a method of data collection,
- Shifting from designer-led empathy (i.e., in a techno-solutionist frame) to empowerment of stakeholders to be a steward of their own design engagement (i.e., justice-oriented),

- Wrestling with privilege that informs how designers understand and frame problems of inequity, moving from a focus on frames of convenience to understanding that larger structural and systemic forces are in play, and
- Recognizing that neo-liberal framings and other structural forces can overwhelm even the most wholesome design intent.

Conclusion

In this chapter, we have described how undergraduate UX design students engaged in digital civics work to support local community needs. Across a range of civic design contexts and intended outcomes, students sought to both engage stakeholders in the doing of design work and in framing possible outcomes, but were unevenly able to frame their work in a civic and justice-oriented way. We characterize several trajectories of engagement and describe how even regression toward techno-solutionism can be useful in promoting long-term reflection about the role and power of designers in complex design spaces that include inequitable structures.

References

Boling, E., & Gray, C. M. (2015). Designerly tools, sketching, and instructional designers and the guarantors of design. In B. Hokanson, G. Clinton, & M. W. Tracey (Eds.), *The design of learning experience: Creating the future of educational technology* (pp. 109–126). Springer International Publishing. https://doi.org/10.1007/978-3-319-16504-2_8

Bradshaw, A. C. (2018). Reconsidering the instructional design and technology timeline through a lens of social justice. *TechTrends: For Leaders in Education & Training, 62*(4), 336–344. https://doi.org/10.1007/s11528-018-0269-6

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of Research in Nursing: JRN, 13*(1), 68–75. https://doi.org/10.1177/1744987107081254

Brulé, E. (2020, April 22). *Thematic analysis in HCI. Design and Society*. Retrieved from https://sociodesign.hypotheses.org/555

Carspecken, P. F. (1996). *Critical ethnography in educational research: A theoretical and practical guide.* Routledge.

Coia, L., & Taylor, M. (2009). Co/autoethnography: Exploring our teaching selves collaboratively. In L. Fitzgerald, M. Heston, & D. Tidwell (Eds.), *Research methods for the self-study of practice* (pp. 3–16). Springer. https://doi.org/10.1007/978-1-4020-9514-6_1

Costanza-Chock, S. (2020). *Design justice: Community-led practices to build the worlds we need*. MIT Press.

Dombrowski, L., Harmon, E., & Fox, S. (2016). Social justice-oriented interaction design: Outlining key design strategies and commitments. In *Proceedings of the 2016 ACM Conference on designing interactive systems* (pp. 656–671). https://doi.org/10.1145/2901790.2901861.

Dorst, K. (2015). *Frame innovation: create new thinking by design*. MIT Press.

Gray, C. M., & Boling, E. (2016). Inscribing ethics and values in designs for learning: A problematic. *Educational Technology Research and Development, 64*(5), 969–1001. https://doi.org/10.1007/s11423-016-9478-x

Gray, C. M., Toombs, A. L., Owczarzak, M., & Watkins, C. (2019). Digital civics goes abroad. *Interactions, 26*(2), 74–77. https://doi.org/10.1145/3301661

Gray, C. M., Parsons, P., & Toombs, A. L. (2020a). Building a holistic design identity through integrated studio education. In B. Hokanson, G. Clinton, A. A. Tawfik, A. Grincewicz, & M. Schmidt (Eds.), *Educational technology beyond content: A new focus for learning* (pp. 43–55). Springer International Publishing. https://doi.org/10.1007/978-3-030-37254-5_4

Gray, C. M., Parsons, P., Toombs, A. L., Rasche, N., & Vorvoreanu, M. (2020b). Designing an aesthetic learner experience: UX, instructional design, and design pedagogy. *International Journal of Designs for Learning, 11*(1), 41–58. https://doi.org/ijdl.v11i1.26065

Gray, C. M., Williams, R. M., Parsons, P., Toombs, A. L., & Westbrook, A. (2021). *Frames for justice consciousness*. Purdue University e-Pubs. https://docs.lib.purdue.edu/cgtoer/1/

Irani, L. (2018). "Design Thinking": Defending silicon valley at the apex of global labor hierarchies. In *Catalyst: Feminism, Theory, Technoscience* (Vol. 4, Issue 1, pp. 1–19). https://doi.org/10.28968/cftt.v4i1.243

Kolko, J. (2018). The divisiveness of design thinking. *Interactions, 25*(3), 28–34. https://doi.org/10.1145/3194313

Maxwell, J. A. (2004). *Qualitative research design: An interactive approach* (2nd ed.). SAGE Publications.

Mayhew, M. J., & Fernández, S. D. (2007). Pedagogical practices that contribute to social justice outcomes. *The Review of Higher Education, 31*(1), 55–80. https://doi.org/10.1353/rhe.2007.0055

Olivier, P., & Wright, P. (2015). Digital civics: Taking a local turn. *Interactions, 22*(4), 61–63. https://doi.org/10.1145/2776885

Vlachokyriakos, V., Crivellaro, C., Le Dantec, C. A., Gordon, E., Wright, P., & Olivier, P. (2016). Digital civics: Citizen empowerment with and through technology. In *Proceedings of the 2016 CHI conference extended abstracts on human factors in computing systems* (pp. 1096–1099). https://doi.org/10.1145/2851581.2886436.

UDL in Educational Technologies for English Language Learners: A Scoping Review of Literature

Douglas Ayega and Newton Buliva

Educational institutions are increasingly relying on technology to reach learners as in-person learning faces challenges, including the Covid19 pandemic restrictions. This increased use of technology has been evident in K12 educational institutions where students have been required to access content using technology. This has meant even English language learners (ELLs) in these institutions have been forced to access educational content through educational technology. This requires increased and continuous learning and skill in digital literacy. Indeed, for individuals to become successful in living, learning, and working in a digitized society, digital literacy has now become essential (Yuan et al., 2019).

According to the US Department of Education (United States Department of Education, Office of Educational Technology, 2017), there has been significant use of educational technology in US learning institutions such that it has transformed learning by ensuring all learners have access to high-quality educational experiences. Educational technology now gives students more choice on what and how they learn, and sophisticated software has allowed adapted assessment and instruction which meets the needs and abilities of individual learners.

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English Language Learners (ELLs) in the US

Why do English language learners matter? According to the US Department of Education (US Dept. of Education, National Center for Education Statistics [NCES], 2020), there were about five million students who identified as ELLs in US public and elementary schools (Fig. 1).

According to the National Center for Education Statistics (Hussar et al., 2020), these students represented 10% or more of the student population in ten states, most of which were in the West, and the District of Columbia. The states with 10% or more ELLs were Alaska, California, Colorado, Florida, Illinois, Kansas, Nevada, New Mexico, Texas, and Washington. The report from the United States Department of Education (2020) shows California reported the highest percentage of ELLs among its public-school students, at 19.2%, followed by Texas (18%), and Nevada (17%). Most of these ELLs are generally enrolled in the lower elementary grades. For example, about 16% of the kindergarteners in the country were ELL students compared with 8.6% who were 6th-grade students and 7% who were 8th-graders. This was mostly because students start elementary school as ELLs but often their English language improves, and they are then dropped from ELL programs as they advance in school.

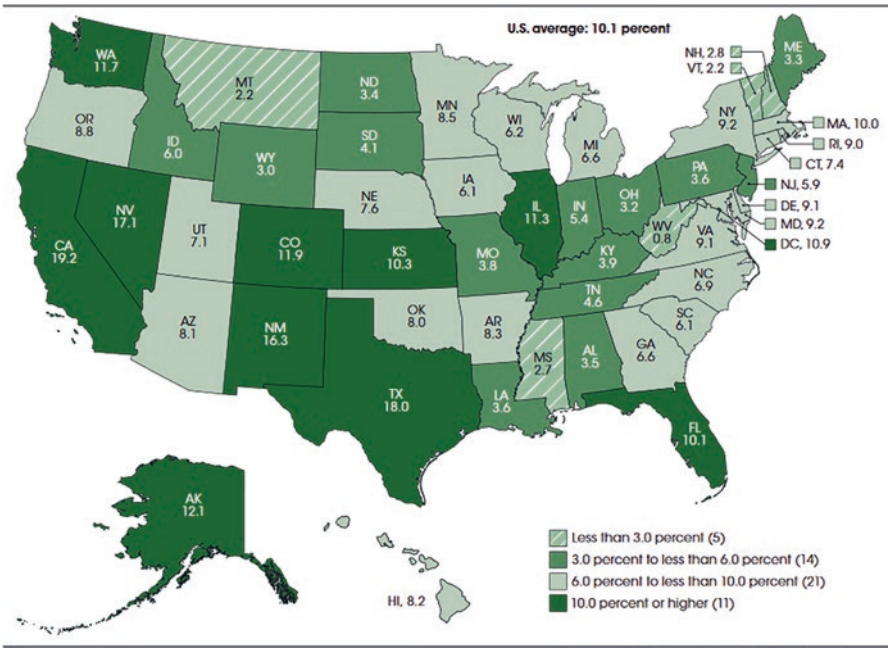

Fig. 1 Map showing percentage of ELLs in US states. (Source: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Local Education Agency Universe Survey," 2017–18. (Used with permission))

Additionally, according to Hussar et al. (2020), more of these ELL students go to school in urbanized areas than the less urbanized areas of the USA In the cities, ELL students constituted about 15% of the total public-school enrollment, about 10% in suburban areas, about 7% in towns, and about 4% in rural areas. About 75% of these students identified Spanish as their first language – constituting about 3.8 million ELL public school students in the fall of 2018. The other main reported languages in 2018 included Arabic, Chinese, Vietnamese, Somali, Russian, Portuguese, Haitian, and Hmong.

Universal Design for Learning Framework and Inclusion

According to McMahon and Walker (2019), the Universal Design for Learning (UDL) framework identifies affective, recognition, and strategic networks correspond to three broad principles:

- Provide Multiple Means of Representation
- Provide Multiple Means of Action and Expression
- Provide Multiple Means of Engagement

UDL is an appropriate framework to understand inclusion using educational technology as it guides educational practices which reduce barriers to instruction, provides appropriate accommodations, supports and challenges, and maintains high achievement expectations for all students, including students with disabilities and English language learners (Higher Education Opportunity Act [HEOA], 2008). McMahon and Walker (2019) state UDL provides a scientific framework for designing curricula that articulates a method of teaching for learning based on planning to include learners with diverse strengths. UDL has thus been used to inform decision-making regarding technology interventions for students (Fig. 2).

How UDL Might Work for ELL-Designed Technology?

What should social justice, equity, inclusion, and community look like in UDL-designed educational technologies for ELLs? The discussion below envisions the use of the three guiding principles of UDL design for educational technologies which target English language learners.

Multiple Means of Engagement

Providing multiple means of engagement involves addressing the affective network of the learners: how they feel about school and the subject content (Spencer, 2011). This principle focuses on getting the students interested in the curriculum by

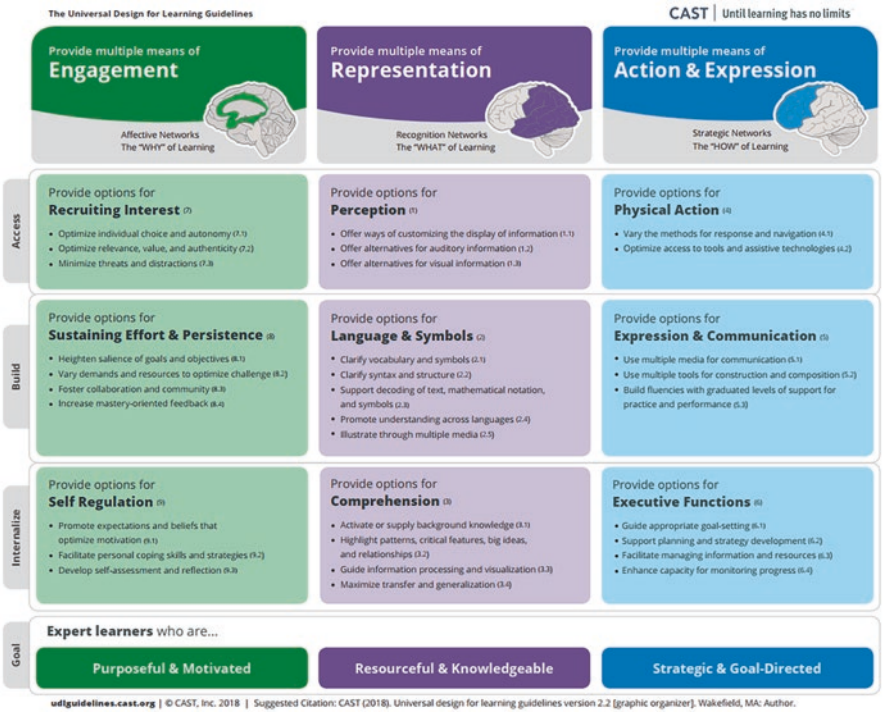

Fig. 2 The UDL guidelines Retrieved from https://udlguidelines.cast.org

providing them with options on how to participate in the classroom (for example, they can participate individually, with a partner, or in a group). The learners are informed of the relevance and value of their interests and goals through authentic and meaningful activities.

Often, however, activities designed for ELLs in US K-12 schools are not personalized and contextualized to the learners' experiences. Some learning activities are culturally and socially irrelevant and unresponsive to the learners, and may not be appropriate for different racial, cultural, ethnic, and gender groups as proposed by UDL principles. Tasks designed for educational technology may sometimes not have activities that mirror the cultures of these diverse students authentically.

According to CAST (2021), the teacher (and the technology design) should reduce potential threats and distractions in the learning environment. This is not limited to physical threats, but also subtler types of threats and distractions. For ELLs, language experimentation can be threatening, embarrassing, or some technology designers might include too many sensory stimulations in programs to the extent that learners find this distractive. According to CAST, inclusive learning (technology design) should offer varying levels of sensory stimulation, social demands, and involve the learners.

Multiple Means of Representation

The second principle, multiple means of representation, acknowledges learning is impossible if the information is imperceptible to the learner. When content is presented in formats that require extraordinary effort or assistance, it is difficult for learners to comprehend it. For educational technology to be successful for ELLs, it should be equally perceptible to all learners by: (a) providing the same information through different modalities (for example, video, sound, vibration), and (b) providing information in a format that allows for adjustability by the user (for example, adjustable text, different audio input, different video input).

Multiple Means of Action and Expression

For the principle of multiple means of action and expression to be viable in a UDL-designed educational technology, learners should have material with which they can interact effectively. For ELLs, this could mean physical or digital objects rooted in their cultures and backgrounds. Designers who intend to have inclusive technology for ELLs should consider varying response rates, timing, and speed to motor action. They should also consider the effects of handedness (some cultures prefer either left or right hand in interactions) or the meaning of physical technological objects which differ across cultures, among other cultural considerations.

Educational Technologies and ELLs

A review by Brown (2007) found that technology was first used in language classrooms in the 1950s and 1960s in the form of language laboratories. These language labs were meant to provide an opportunity for learners to listen to a native English speaker speaking in English and thus imitate them. However, these labs were not successful in transforming ELLs into proficient English speakers. Brown states the arrival of personal computers in schools in the 1980s was met with more skepticism because of previous lessons learned.

Over the years, the use of computers, for example, the use of computer-assisted language learning (CALL) programs in English language learning classrooms, has increased exponentially. These programs are being used in collaborative projects, peer-editing of texts, increased communication through email, project work through web-building projects, reinforcement of classroom material, games and simulation, computer-adaptive assessments, speech processing, among others (Brown, 2007). Studies have suggested using a personal computer in the classroom (for example, the use of word processing) can increase the quantity and quality of student writing more than the sole use of traditional instruction (Al-Jarf, 2002; Allen & Thompson, 1994; Beyer, 1992).

Educational technology has been a great complement to theorists of second language acquisition (SLA), such as ELLs. One way to learn a second language is the use of strategies that provide comprehensive input to the learners. Krashen's (1982) theory of second language acquisition states for language to be understood by the learner, it must take place in a low affective filter environment. This means the learning environment should not be stressful for the learner and the learner should be comfortable making mistakes as he/she learns. Krashen notes learning interaction should motivate learners, provide them with self-confidence, and lower anxiety. Educational technologies are primed to provide such a learning environment so learners can make mistakes while interacting with a learning program and learn from these mistakes. Incremental steps in learning which provide motivation (such as achievement badges or points in gamified learning environments) help to motivate and improve learners' self-confidence. Licorish et al. (2017) note that game-based learning can motivate engagement and ultimately improve students' learning experience. Educational technologies can also assist teachers to make language input comprehensible by, for example, showing pictures of objects (*realia*), visuals, audio, video, 3D objects, and other displays which may lead learners to make meaning of language.

Other second language acquisition theorists suggest comprehensible input is acquired through an interactionist position which acknowledges the role of two-way communication (Ariza & Hancock, 2003; Long, 1985; Pica, 1994). When properly designed, educational technologies can provide multi-way communication between learners, teachers, or other sources of knowledge. The idea that knowledge is constructivist, enabled by educational technologies, empowers learners to draw from their rich cultural backgrounds in interacting with content and language.

Educational Technology: Inclusion and Social Equity

Although these technologies may afford English language learners a broad range of opportunities for literacy practices to take place (Yuan et al., 2019), there is a need for the designers of these technologies to address social inequity faced by the learners as they interact with digital content. Educational technologies have been accepted as tools that increase learners' pace of language acquisition, self-esteem, vocational preparedness, language proficiency, and overall academic skills (Liu et al., 2002). Other studies have suggested educational technologies have closed the achievement gap between ELL students and non-ELL students while increasing ELL student achievement (López, 2010).

Methodology

We used a scoping review to explore the literature on ELLs and technology since scoping reviews aim to map rapidly the key concepts underpinning a research area and the main sources of evidence available (Mays et al., 2001). Scoping reviews are used to identify research gaps, summarize the findings of the research, or inform systematic reviews (Armstrong et al., 2011). According to Arksey and O'Malley's (2005), there are at least four reasons for a scoping review:

- To examine the extent, range, and nature of research activity
- To determine the value of undertaking a full systematic review
- To summarize and disseminate research findings
- To identify research gaps in the existing literature.

Following Arksey and O'Malley's (2005) recommendations, this scoping study is guided by a requirement to identify relevant literature regardless of the study design. This process is not linear but iterative, and we were willing to adjust search terms to ensure the literature is covered comprehensively. As per Arksey and O'Malley's recommendations, we adopted the following framework in conducting this scoping literature review:

Stage 1: Identifying the research question
Stage 2: Identifying the relevant studies
Stage 3: Study selection
Stage 4: Charting the Data
State 5: Collating, summarizing, and reporting the results.

Additionally, we used the Universal Design for Learning (UDL) framework to inform our research since this framework is intended to improve and optimize teaching and learning for all people based on evidence-based practices (CAST, 2021). For ELL students, the principles of simplicity and intuition of the use of technology cannot be overstated. The UDL framework enabled us to understand other principles of technology use by ELLs such as tolerance for error, low physical effort, equitable use, flexibility in use, and size and space for approach and use principles.

We analyzed the literature for:

- Descriptions on how technology is designed to address social inequity and systemic racism,
- The extent to which the educational technology uses Universal Design for Learning (UDL) to reduce the learning gap between ELL and other students, and
- How the technology is designed to be inclusive.

The Research Question

Our research problem is all learners, in some form, face barriers to learning. For English language learners in the US, language, cultural, social, technical, and financial environments are just some of the few barriers confronting them. Often these barriers lead to learning deficits, a lack of engagement in education, and even student drop-out from the education process (Floe Inclusive Learning Design Handbook, 2021). According to the Inclusive Design Research Centre (IDRC), an inclusive design considers the full range of human diversity for ability, language, culture, gender, age, and other forms of human difference (Inclusive Design Research Centre, 2021). Therefore, do educational technology designers use inclusive learning strategies which include ELL learners when designing learning for K-12 schools in the US?

The purpose of this study is to evaluate the application of inclusive learning designs on educational technologies used by ELLs in US K-12 schools. We used a scoping review of the literature on educational technology specifically targeting ELLS in US K-12 schools to evaluate how this technology demonstrated inclusion, reduced the digital divide, reduced the achievement gap, and fostered social equity.

The research question for this scoping review is: Given the strong interest in the technology used for language learning, to what extent do educational technologies used to instruct English language learners employ an inclusive learning design?

Identifying the Relevant Studies

Since a scoping review aims at providing an overview or map of the evidence (or lack thereof), this scoping review of literature scoured articles across a range of databases, organizational websites, and conference abstracts repositories based upon predetermined inclusion criteria (Munn et al., 2018). We reviewed publications to find out ways in which educational technologies employ an inclusive learning design, and how these technologies address social inequities in US K-12 schools. The review was restricted to educational technology use in K-12 institutions. We searched the major educational research databases including Education Research Complete, Education Resources Information Center (ERIC), JSTOR, and handsearched using Google Scholar.

Study Selection

Our search terms were specific since we intended to capture the inclusiveness and equity of technology as it is used by English language learners in the K12 education settings. The search terms we used were: “English language learners,” “K-12

educational technology," "second language learners," and "learning technology." The dates were limited to the years 2012 and 2021. We deliberately avoided search terms like "inclusion, equality, social inequity" so that the whole range of articles would be available to us. Our inclusion criteria were studies published since 2012 (only studies done in the last 10 years) about K12 education in the US, and studies addressing only educational technology in K12 schools. We also limited our criteria to studies published in English.

Our exclusion criteria for articles were:

- Articles not addressing technology in K12 learning institutions, or not examining technology and how ELLs use it,
- Studies not addressing the US K12 education,
- Studies duplicated across the different databases,
- Pamphlets, flyers, or promotional material not based on research,
- Inaccessible resources, and
- Resources that do not address the research question and do not contribute to our understanding of the problem.

Through our scoping review, we looked at the literature on the design of educational technologies as they impact ELLs. We examined how these technologies address: (a) equity in education, (b) social justice, (c) policy issues, (d) implicit (even explicit) bias in terms of race or ability, and (e) inclusion. We met at the beginning of the process, at the midpoint of the project, and later we independently reviewed the studies selected at the final stage of the project as recommended by Levac et al. (2010). During this consultative process, we sought to alleviate any ambiguity resulting from the scoping reviews.

Results

From these parameters, our search on the ERIC database yielded 247 results which ranged from educational technology use through Makerspaces to one-on-one technology in K-12 learning environments. The JSTOR database yielded 145 results and we also analyzed 65 hand-searched articles.

For our scoping review study, and given the above limitations, 25 articles met the inclusion criteria and are shown in Fig. 3 below.

A summary of the results of the scoping review articles with UDL themes is shown in Table 1 below.

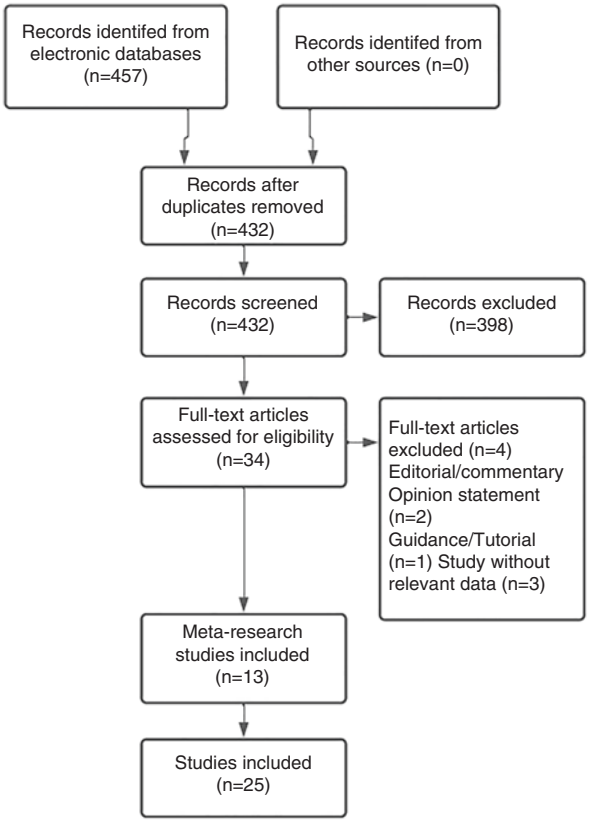

Fig. 3 Flow diagram of identification, screening, and inclusion of studies

Analysis and Discussion

Consistent with Arksey and O'Malley's (2005) recommendations on scoping reviews, we conducted a frequency and thematic analysis to identify the UDL principles of engagement, representation, and action. For engagement, we recorded whether the research studies and technology being implemented addressed student interest in content and learning, student sustained effort and persistence, and self-regulation. For representation, we reviewed the research for evidence of how technology provides learner perception, language, and symbols which make it easier for students to understand the content, and if this technology provides for content comprehension. Lastly, for action and expression, we reviewed whether these technologies provided options for student physical action, expression, and communication and if they provide for executive function.

Table 1 Summary of results of scoping review articles with UDL elements

UDL Theme	Number of articles (%)	Articles
Engagement	21 (84%)	Altavilla (2020); Brasiel et al. (2016); Carhill-Poza (2017); Castañeda (2013); Chen et al. (2017); Danzak (2011); Darling-Aduana and Heinrich (2018); Freeman (2012); Harper et al. (2021); Li (2013); McNulty and Lazarevic (2012); Ok and Ratliffe (2018); Peterson et al. (2021); Rao (2015); Shin (2014); Turgut (2012); Uro et al. (2020); Wang and Vásquez (2012); Yuan et al. (2019); Zehler et al. (2019).
Representation	11 (44%)	Altavilla (2020); Carhill-Poza (2017); Castañeda (2013); Chen et al. (2017); Danzak (2011); Rao (2015); Shin (2014); Uro et al. (2020); Yuan et al. (2019); Zehler et al. (2019).
Action and Expression	17 (68%)	Altavilla (2020); Brasiel et al. (2016); Carhill-Poza (2017); Castañeda (2013); Chen et al. (2017); Danzak (2011); Harper et al. (2021); Li (2013); McNulty and Lazarevic (2012); Ok and Ratliffe (2018); Rao (2015); Shin (2014); Turgut (2012); Uro et al. (2020); Wang and Vásquez (2012); Yuan et al. (2019).

Multiple Means of Engagement

Except for four research studies, all the articles reviewed articulated how educational technology provided some form of student engagement. These included technologies assisting students in reading and writing English or interacting with content from other K12 learning content. The review suggested most educational technologies which target ELLs in K12 educational settings aim to provide high levels of engagement. Most of the literature (84%) recognized that educational technologies need to be engaging to maintain student interest in the content. One study reported student-to-student communication enhances engagement (Carhill-Poza, 2017). A case study by Castañeda (2013), also underlines the use of personal narratives, memorial stories, and accomplishment stories to enhance student engagement. Additionally, Li (2013) also recommends learners engage with the real world using authentic learning activities of interest to them.

According to CAST (2021), there is not one means of engagement that is optional for all learners in all contexts, therefore technology should provide multiple options for engagement. Engagement requires the recruitment of the learners' interest, sustaining effort and persistence, and learners being able to regulate themselves. Of the 25 studies in our scoping review, eight studies recorded or recommended the use of multiple options for student engagement. However, most of the studies reported on amorphous technology like "computers," "laptops," "media technology," and others.

Multiple Means of Representation

Of the 25 studies in this scoping review, only 11 (or 44%) of the articles described some form of representation that would make ELL students see themselves represented in the technology in terms of language and symbols which enhance understanding of content. Most articles described technology as a discrete, impersonal tool that the students cannot engage with through their lived experiences. Technology is variously identified as enabling students to memorize content and practice some concepts learned. Only two studies recommended some representation in educational technology of students' first languages (Carhill-Poza, 2017; Castañeda, 2013), while another suggested representation of culture through US cultural symbols like blogging about Halloween, the tooth fairy, or US movies (Shin, 2014). Several studies recognized the importance of learners incorporating their lived experiences, aspirations, and cultural backgrounds into the classroom using technology (Altavilla, 2020; Chen et al., 2017; Danzak, 2011; Li, 2013; and Rao, 2015).

CAST (2021) indicates the UDL principle of representation requires there not be only a singular means of representation for all learners. Instead, multiple representations should be used to accommodate the different ways learners perceive and comprehend information. This includes using cross-linguistic language and symbols or providing alternatives that make information accessible to all learners. Considering only 11 out of 25 articles had some form of representation, this suggests not many creators of educational technologies provide multiple representations for K12 learners. Most of the educational technology still targets native English speakers, making learning inaccessible to the non-native ELL students.

Multiple Means of Action and Expression

On action and expression, only 17 of the 25 studies (68%) revealed the presence of this UDL principle. Most of the articles addressed student interaction with technology as part of action and expression. A study by Altavilla (2020) recommends technology promote social interaction between ELLs and native English speakers to enhance their language skills. Additionally, when students use the audio functions of technology to record themselves or to write about their culture, the physical action of interacting with technology promotes the UDL principle of action and expression. Some articles recommended students blog or use technology to talk about their culture, values, and beliefs as a form of self-expression (Chen et al., 2017). Some studies noted students enjoy manipulating electronic objects and interacting with technology and this can be leveraged to lead to students' better grasp of content. Other actions and expression principles included the use of mobile devices, student blogs, laptops, the creation of electronic projects, and gamification.

Regarding action and expression, UDL guidelines require educational technologies to provide options for action and expression which address the different ways

learners navigate learning environments. Therefore, ELLs should be able to express themselves using either text, speech, audio, or kinesthetically according to their preference. Since educational technologies require some action by users (typing, clicking, swiping, etc.) the research suggested minimal adherence to this principle. However, most of the technologies reviewed did not indicate the provision of alternatives like altering timing, speed, range of motion, different ways to use the mouse, use of voice, adapted keyboards, and others.

Conclusion

This scoping review leads us to suggest that, although creators of educational technology are striving to incorporate UDL guidelines in K12 learning technologies, much remains unaddressed to realize these goals. To address systemic barriers to equitable educational opportunities, creators of educational technologies should strive to avail to learners by way of multiple means of engagement, representation, and action and expression. The scoping review found that of the articles reviewed, 14 (56%) of the articles lacked one or more UDL themes. This implies that more than half of educational technologies used by learners may not comply with UDL principles. Creators of technologies that target the ELL population should emphasize especially the need for engagement, representation, and action and expression in these technologies. One way is to use the background knowledge that these learners already possess. ELL learners can also be engaged when their lived experiences and cultures are used to design content for them, as recommended by UDL principles.

References

Al-Jarf, R. (2002). Effects of online learning on struggling ESL college writers. In *National Educational Computing Conference '02*.

Allen, G., & Thompson, A. (1994). *Analysis of the effect of networking on computer-assisted collaborative writing in a fifth-grade classroom*. ERIC No. ED373777.

Altavilla, J. (2020). How technology affects instruction for English learners. *Phi Delta Kappan, 102*(1), 18–23.

Ariza, E. N., & Hancock, S. (2003). Second language acquisition theories as a framework for creating distance learning courses. *International Review of Research in Open and Distance Learning, 4*(2).

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19–32.

Armstrong, R., Hall, B. J., Doyle, J., & Waters, E. (2011). Cochrane update: "Scoping the scope" of a Cochrane review. *Journal of Public Health, 33*(1), 147–150.

Beyer, F. S. (1992). *Impact of computers on middle-level student writing skills*. ERIC No. ED345297.

Brasiel, S., Jeong, S., Ames, C., Lawanto, K., Yuan, M., & Martin, T. (2016). Effects of educational technology on mathematics achievement for K-12 students in Utah. *Journal of Online Learning Research, 2*(3), 205–226.

Brown, H. D. (2007). *Teaching by principles: An interactive approach to language pedagogy* (3rd ed.). Pearson Longman.

Carhill-Poza, A. (2017). Re-examining English language teaching and learning for adolescents through technology. *System, 67*(1), 111–120.

CAST. (2021). *About Universal Design for Learning*. Retrieved from https://www.cast.org/impact/universal-design-for-learning-udl?utm_source=udlguidelines&utm_medium=web&utm_campaign=none&utm_content=homepage

Castañeda, M. E. (2013). "I am proud that I did it and it's a piece of me": Digital storytelling in the foreign language classroom. *CALICO Journal, 30*(1), 44–62.

Chen, Y., Carger, C. L., & Smith, T. J. (2017). Mobile-assisted narrative writing practice for young English language learners from a funds of knowledge approach. *Language Learning & Technology, 21*(1), 28–41.

Danzak, R. L. (2011). Defining identities through multi-literacies: EL teens narrate their immigration experiences as graphic stories. *Journal of Adolescent & Adult Literacy, 55*(3), 187–196.

Darling-Aduana, J., & Heinrich, C. J. (2018). The role of teacher capacity and instructional practice in the integration of educational technology for emergent bilingual students. *Computers & Education, 126*, 417–432.

Floe Inclusive Learning Design Handbook. (2021). Retrieved from https://handbook.floeproject.org/

Freeman, B. (2012). Using digital technologies to redress inequities for English language learners in the English-speaking mathematics classroom. *Computers & Education, 59*(1), 50–62.

Harper, D., Bowles, A. R., Amer, L., Pandža, N. B., & Linck, J. A. (2021). Improving outcomes for English learners through technology: A randomized controlled trial. *AERA Open, 7*, 23328584211025528.

Higher Education Opportunity Act. (2008). *Public Law 110-315 U.S.C.*

Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., Smith, M., Bullock Mann, F., Barmer, A., & Dilig, R. (2020). *The condition of education 2020* (NCES 2020–144). U.S. Department of Education. National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020144

Inclusive Design Research Centre. (2021). *What is inclusive design?* Retrieved from https://idrc.ocadu.ca/

Krashen, S. (1982). *Principles and practice in second language acquisition*. Pergamon Press.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science, 5*(69), 1–9.

Li, N. (2013). Seeking best practices and meeting the needs of the English language learners: Using second language theories and integrating technology in teaching. *Journal of International Education Research (JIER), 9*(3), 217–222.

Licorish, S. A., George, J. L., Owen, H. E., & Daniel, B. (2017). "Go Kahoot!" enriching classroom engagement, motivation, and learning experience with games. In *25th international conference on computers in education*. Asia-Pacific Society for Computers in Education.

Liu, M., Moore, Z., Graham, L., & Lee, S. (2002). A look at the research on computer-based technology use in second language learning: A review of the literature from 1990–2000. *Journal of Research on Technology in Education, 34*(3), 250–273.

Long, M. H. (1985). Input and second language acquisition theory. In S. Gass & C. Madden (Eds.), *Input in second language acquisition* (pp. 377–393). Newbury House.

López, O. S. (2010). The digital learning classroom: Improving English language learners' academic success in mathematics and reading using interactive whiteboard technology. *Computers & Education, 54*(4), 901–915.

Mays, N., Roberts, E., & Popay, J. (2001). Synthesising research evidence. In N. Fulop, P. Allen, A. Clarke, & N. Black (Eds.), *Studying the organisation and delivery of health services: Research methods* (pp. 188–220). Routledge.

McMahon, D. D., & Walker, Z. (2019). Leveraging emerging technology to design an inclusive future with universal design for learning. *CEPS Journal, 9*(3), 75–93.

McNulty, A., & Lazarevic, B. (2012). Best practices in using video technology to promote second language acquisition. *Teaching English with Technology, 12*(3), 49–61.

Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology, 18*, 143.

Ok, M. W., & Ratliffe, K. T. (2018). Use of mobile devices for English language learner students in the United States: A research synthesis. *Journal of Educational Computing Research, 56*(4), 538–562.

Peterson, L. S., Pham, S., & Solé, M. (2021). Supporting English learners during virtual learning. *Communiqué, 49*(6).

Pica, T. (1994). Research on negotiation: What does it reveal about second language learning conditions, processes, and outcomes? *Language Learning, 44*(3), 493–527.

Rao, K. (2015). Universal design for learning and multimedia technology: Supporting culturally and linguistically diverse students. *Journal of Educational Multimedia and Hypermedia, 24*(2), 121–137.

Shin, D. (2014). Web 2.0 tools and academic literacy development in a US urban school: A case study of a second-grade English language learner. *Language and Education, 28*(1), 68–85.

Spencer, S. A. (2011). Universal design for learning: Assistance for teachers in today's inclusive classrooms. *Interdisciplinary Journal of Teaching and Learning, 1*(1).

Turgut, G. (2012). A case study on use of one-to-one laptops in English as second language classrooms. *Online Submission, 3*(4), 28–47.

United States Department of Education, Office of Educational Technology. (2017). *Reimagining the role of technology in education: 2017 National education plan update*. Retrieved from http://tech.ed.gov

United States Department of Education, National Center for Education Statistics. (2020). *Common Core of Data (CCD), Local education agency universe survey, 2000–01 through 2018–19.* Retrieved from https://nces.ed.gov/programs/coe/indicator_cgf.asp#info

Uro, G., Lai, D., & Alsace, T. (2020). *Supporting English learners in the COVID-19 crisis*. Council of the Great City Schools.

Wang, S., & Vásquez, C. (2012). Web 2.0 and second language learning: What does the research tell us? *CALICO Journal, 29*(3), 412–430.

Yuan, C., Wang, L., & Eagle, J. (2019). Empowering English language learners through digital literacies: Research, complexities, and implications. *Media and Communication, 7*(2), 128–136.

Zehler, A. M., Miyaoka, A., Chaney, B., Orellana, V., Vahey, P., Gibney, D. T., Yee, K., & Yilmazel-Sahin, Y. (2019). *Supporting English learners through technology: What districts and teachers say about digital learning resources for English learners. Volume II: Technical appendices*. Office of Planning, Evaluation and Policy Development, US Department of Education. Retrieved from https://www2.ed.gov/about/offices/list/opepd/ppss/reports.html

Part IV
Critical Race Theory and Human Rights

Critical Instructional Design as Social Action in Canadian Higher Education

Diane Janes, Lorraine Carter, and Katy Campbell

In this chapter, we will explore the intersection of critical pedagogy and design in the context of university continuing education in Canada, through two case studies, the first involving a health education scenario and the second an exploration of Indigenous values and practices. In the spirit of full disclosure, in each case, we were active participants in the design experience.

Social change is inextricably linked with profound struggles such as apartheid, global migration, equal rights for women, and Black Lives Matter in the United States and Idle No More in Canada. Social change also requires agency. It is culturally and politically situated and is manifested in the way to choose to "think and do" design (Campbell et al., 2009; Fry, 2011). Design fields have been evolving in theory and practice from craft-based design to applied human and social sciences, and towards transdisciplinary and collaborative approaches, for example, participatory instructional design. According to Banerjee (2008), "… given this tense moment in the history of civilization, with its unique challenges and the core attributes of the design field, it would be appropriate for the design field to assume a new identity with a fundamentally altered set of implications and sphere of influence. What makes the designer a promising agent is not a single attribute, but the gestalt of the skills, cognitive processes, design methodologies, attitudes, and structural aspects"

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B. Hokanson et al. (eds.), *Toward Inclusive Learning Design*, Educational Communications and Technology: Issues and Innovations,
https://doi.org/10.1007/978-3-031-37697-9_24

(p. 116), including ability to reflect critically on the social, cultural, and political aspects of design contexts and problems.

Critical theories are fundamentally activist, responding to the real world through political, educational, and philosophical means. Sociocultural transformation is the goal, which occurs by challenging the purposes, goals, and aims in and for which knowledge is created and shared. Sources of power and oppression are a central focus of critical theory; for example, who and what is a legitimate source of knowledge? Who is privileged to create it? Who is excluded from this process? These questions are reflexive, requiring assessment, critique, and reflection on society, and often reveal the taken-for-granted assumptions of particular organizations, communities, and institutions. Feminist theory, critical race theory, critical theory of technology, and intersectionality are examples of critical theories. We are proposing that critical instructional design theory is a legitimate member of the critical theory constellation because, historically, design has always been future-orientated and change-orientated. Instructional design supports learning and change by presenting different ways of knowing, new perspectives, and action for change.

Critical pedagogy, reflecting the insights of theorists like Freire (2004), Apple (c.f. 2011), Hooks (c.f. 1994) and others addresses how relationships of inequality and oppression are produced and reproduced in educational institutions: Design practice is a subset of this larger framework. As an example, universal instructional design exemplifies social action in its service of critical pedagogy. Participatory design is another approach in which a critical instructional designer might frame design questions and make decisions that address issues of cultural authority, learner voice, the source of knowledge, oppressive practices, and access to learning. Morris (2017) describes critical instructional design as an "emerging" attempt to interrogate methodologies to create agentic spaces in the learning environment. Eschewing a behaviorist or cognitive approach, critical instructional design assesses how content, representation, interaction, delivery, and assessment are set up to privilege some voices and not others. The critical designer "prioritizes collaboration, participation, social justice, learner agency, emergence, narrative, and relationships of nurture between students, and between teachers and students" (2018, para 26), casting the designer as an agent of social change, within institutions of learning, be they workplaces or classrooms. Although, historically, instructional designers created learning environments that conformed to dominant, even colonial, cultural expectations for learning, emphasizing uniformity and compliance (remember the "blueprint"?), the critical instructional designer may use their social and creative agency to create space for social innovation (c.f. Adams, 2018; Saunders, 2006). Morris points out that designers must clear their minds of "old stories," or what we have elsewhere called the dominant cultural narratives, of instructional design (Campbell & Janes, 2021) and "become more critically conscious of the work at hand," which:

- centers its practice on community and collaboration.
- must remain open to diverse, international voices, and thus requires invention to reimagine the ways that communication and collaboration happen across cultural and political boundaries.

- will not, cannot, be defined by a single voice but must gather a cacophony of voices.
- must have use and application outside traditional institutions of education (Morris & Strommel, 2018, para. 23).

We are interested in critical instructional design to challenge dominant cultural assumptions and develop learning environments for social justice. It is our view that a critical pedagogy framework when used in the design context has potential to include learners with disabilities; learners who identify as lesbian, gay, bisexual or transgender; learners who are racialized, aging, or poor; learners who are marginalized by geography or politics; and learners who are regarded as "foreign," not fluent in English, and so on (Johnson, 2004). In Canada, each of these learner groups exists.

The pluralistic Canadian context also includes diverse communities of learners who live in isolated rural and/or northern settings with infrastructure restrictions; are Indigenous; are early school leavers; and are political refugees. With a large land mass and minimal population, distance has been a challenge in Canada. While equity, diversity, and inclusion (EDI) policies have led to decolonization of curriculum in many schools and other sites of formal and informal learning, there is still much work to do. Importantly, many university continuing education units are making important strides in advancing social justice through their commitment to critical pedagogy brought to the design experience.

In Canada, unlike most other nation states, the discourse of nationhood must include the possibility of many nations: for example, First Nations, which are themselves extraordinarily diverse with more than seventy languages; and the province of Quebec, which is currently launching a constitutional challenge for nation status. Parrish and Linder-VanBerschot (2010) remind us that "when we teach, we are teaching culture"; how we design is just as important as what we design (p. 5). Designers need to be aware of their own cultural beliefs and biases as they develop curriculum, choose resources, and consider learning activities and delivery challenges.

Along with being a diverse cultural community with an aging population, Canada presents unique design challenges in terms of geography, demographics, and politics. In a large land mass with many remote, even isolated communities, broadband access can be unreliable, even in urban areas. Rural, northern, and Indigenous communities face both physical and social divides, for which curriculum development and delivery must account. Furthermore, like many Western nations, Canada has a growing cultural divide that has initiated regional attacks on education, for example, the controversial proposed Alberta K-12 curriculum that perpetuates colonial perspectives.

Continuing Education in Canada: History and Context

The history and role of continuing education in Canada is important to the discussion of critical pedagogy and design. As a professional practice area, continuing education in Canada first developed from a commitment to personal, social, and economic betterment. Although this may be surprising to some, continuing education is also a field in which scholarship plays a unique role. According to Nesbit (2011), those who serve as scholars in adult and continuing education contribute to "a forum for people to imagine what is possible…[and] to address the emergent issues affecting Canadian adult education…" (ii). Through this forum, practical knowledge derived from evidence, reflections on past practices, and considerations of new opportunities grounded in human experiences and different ways of learning are explored (Mizzi, 2020).

The recurring themes in the practice and scholarship of continuing education in Canada of specific relevance to this chapter are social justice and inequity in work; recognition of the knowledge and skills of adults; immigrants and Indigenous communities; and resilience. In Table 1, these themes are briefly highlighted as a means of situating the case studies that follow below in the chapter (Carter & Janes, 2021).

Table 1 Dominant themes in continuing education in Canada

Theme	Insights
Social Justice and Inequity in Work	The experiences of unemployed or displaced workers who turn to continuing education to re-train, acquire new skills, and otherwise advance is well documented in the continuing education literature (Chan et al., 2020; Parker et al., 2020). Similarly, continuing education units are well acquainted with inequities in the work environment as they involve immigrants seeking meaningful work in a new country and women as employees with homemaking, childcare, and elder care responsibilities (Chau, 2020; Heavey & Jemmott, 2020).
Recognition of the Knowledge and Skills of Adults	Recognizing and validating the existing knowledge and skills of adults have long since been part of the continuing education landscape (Conrad & Wardrop, 2010; Kops, 2020). While continuing education units may have experienced roadblocks in advancing this goal in the past, in light of the global pandemic of 2020–2021, there appears to be some appetite for this work, and continuing education is well positioned to play a leadership role in it.
Immigrants and Indigenous Communities	As a key demographic of the Canadian workforce, immigrant workers often require specialized language, cultural, and daily life support which they may be more likely to get through the continuing education unit than elsewhere on the university campus (Chau, 2020; Ganguly et al., 2019; Shan, 2015). Programs meeting the needs of internationally trained professionals may also be offered through the continuing education unit (Canadian Association for University Continuing Education, 2021). Some continuing education units in Canada are known for their work with diverse communities, including Indigenous communities (Carter & Rukholm, 2009; Carter et al., 2009). In part, this derives from continuing education's expertise in distance education and its philosophical orientation of diversity, equity, and inclusion.
Resilience	Continuing education in Canada is known for doing things differently and its overall resilience. The involvement of continuing education in the re-skilling of Canadians as we move through a global pandemic is an excellent example of a professional field defined by resilient thinking and practice (Carter & Janes, 2021).

Two Case Studies

The case studies we have chosen to highlight, the first with a health education focus and the second with an Indigenous lens, embody critical pedagogy/critical design as the overarching commitment, share design actions/processes, and present reflections on the experience.

Case Study 1 Infection Prevention and Control for Family Caregivers

This first case study pertains to an open access, no cost, online health education program created during the current global pandemic. Canada prides itself on how health care is available to all. "Canada has a decentralized, universal publicly funded health system called Canadian Medicare," with each of 13 provinces and territories responsible for administration of care and its own insurance plan (Allin et al., 2020). While this system of universal health care is the envy of many countries, it is not without shortcomings: family and informal caregiving as carried out in the home is one of these shortcomings. Described as care provision without compensation for a relative, spouse, or friend at home, family or informal caregiving occurs at alarming rates in Canada, and is principally carried out by women (Campione & Zebrak, 2020). The inequities implicit in such circumstances are grounded in issues of gender and a de-valuing of caregiving work (Chau, 2020; Heavey & Jemmott, 2020).

In 2018, approximately eight million Canadians aged 15 and older were reported to be serving as caregivers to a family or friend with a long-term health condition, physical or mental disability, or aging related problem (Bakas et al., 2004; Ranelli & Aversa, 1994; Statistics Canada, 2021). The burden of caregiving manifests in high levels of stress, anxiety, depression, and social isolation which often affects the caregiver's own health (Adelman et al., 2014; Judge et al., 2011; Schulz & Sherwood, 2008). The recent pandemic, when existing supports for caregivers and their loved ones were further limited, modified, or withdrawn, led to new levels of anxiety and stress, including fear of bringing Covid-19 to the loved one and fear for the caregiver's own health.

This was the context for actions taken by McMaster University Continuing Education to work closely with a passionate caregiver-advocate and members of the Ontario caregiver community to co-design (Souleles, 2017) an open access, no-cost, online course called *Infection Prevention and Control for Family Caregivers*. Building on the early roots of co-design or participatory design in Europe in the 1970s when workers were invited to participate in the development of systems to improve their workplace (Fuad-Luke, 2009), the overarching strategy was a setting aside of traditional instructional design processes and an enabling of "end-users [caregivers] [to] become active and equal partners" (Souleles, 2017). This way,

caregivers would experience greater control over their work environment where new knowledge and skills are essential to their efforts to provide safe care to loved ones and to remain physically and mentally safe in the midst of a pandemic.

The course was the result of egalitarian strategies and creative input by members of the McMaster Continuing Education staff and the people who would most benefit from the experience. Another way of thinking about this was that the co-design process involved diverse individuals working together, and it emphasizes the significance of networks of people over hierarchies (Fuad-Luke, 2009). The idea of "nothing about us without us" served as a touchstone throughout the project (Charlton, 1998). While the slogan originally found its home in the disability movement, it is equally applicable to caregivers who labour invisibly, without pay, and often without voice.

While caregivers themselves were key members of the design team, other networks (Fuad-Luke, 2009) were also involved given the newness of the virus and the criticality of offering the best possible information in a changing life and death landscape. Thus, McMaster staff, in addition to working closely with caregivers, consulted health educators and policy makers across the province, health professionals in different clinical settings, and representatives from Ontario's long-term care sector which was devastatingly affected by the pandemic.

The caregivers informed the experience in three principal ways: first, they validated a need for an accessible, no-cost, online resource; next, they shed light on what the curriculum needed to include, and finally, they provided insight into the actual design of the course.

Regarding the first area, according to Deniz Çetin and Aryana (2015), design activism is about the development of new products and experiences focused on social, environmental, and political issues. It is also about avoiding excessive and useless products and experiences. In the case of an online course about infection control and practices for caregivers that would present ideas through accessible language and simple media applications, it was important to learn from caregivers if such a course already existed. Importantly, at the time this course was under consideration, public health, hospitals, long-term care facilities, and other organizations were aggressively engaged in generating information about the virus and how to stay safe. Through interactions with the caregivers, however, it was validated that no such course existed and that an appropriately co-designed course would provide accessible information across the physical distance of Ontario (Carter et al., 2016); to serve as a support framework for people who need to shield from Covid-19 and those who enable this shielding; and provide psychological support to all (Rotarou et al., 2021).

In relation to curriculum, the caregivers identified that there was a profound need to understand the chain of infection and how to break it in contrast with simply learning how to don and doff personal protective equipment which was the focus of other educational resources. Understanding infection and its relationship with hand washing rather than just learning how to handwash was also identified as important.

These insights underscored the need for the course to be human-centred and empathetic (Souleles, 2017) in contrast with being a training opportunity. In the latter context, there is risk of a de-emphasis on knowing why and not recognizing the person at the centre of the learning as a complex human being with needs of their own and anxieties around providing care in a pandemic.

From the perspective of course design, the caregivers were the guardians of accessible language rather than medical jargon. They also ensured that the course could be accessed without institutional barriers, such as complicated IDs and passwords, and conveyed the need for the course to have value in their lives now and in the future since caregiving and viruses are ongoing experiences. Appendix 1 outlines the key instructional design values and practices brought to the course as informed by the caregivers' recommendations and critical pedagogy literature. In short, the course is defined by a commitment to equity, flexibility, simplicity and intuition, and value (Caregiver Consultations, 2020; Daniel, 2016; de Bie & Brown, 2017; Guo & Liu, 2021). Regarding value as a kind of return on investment, the course includes a printable Certificate of Completion which some course participants have spoken about as validation of their learning and an empowering takeaway.

In addition to being a course of evidence-based information made available to the caregiving public at no cost, based on anecdotal evidence, the course has reduced caregiver anxiety, which had been at an all-time high. In a large survey of caregivers carried out in Japan regarding caregiving early in the pandemic, informal and family caregiving was related to mental health deterioration and self-reported deterioration. In particular, it was reported to be the most severe among female caregivers (Taniguchi et al., 2021). As evidence of the impact of the McMaster course on caregivers, one female caregiver who provides care to her elderly father spoke about her anxiety of passing Covid-19 to him since she needs to leave the house for errands. Through the course, however, her fear has been diminished, and she now understands how she and her father can co-exist safely without undue worry during this challenging time.

A further positive outcome is that caregivers who have taken the course (at the time of writing, 1500 persons have taken the course) may now have valuable knowledge, language, and confidence to bring to interactions with the healthcare system to effect change. At the best of times, the Canadian healthcare system can be daunting. However, having evidence-based information, appropriate language, and confidence to ask good questions and possibly even challenge a health professional who has not done handwashing before approaching a care recipient is empowering. Linking these ideas to continuing education in Canada, the course reflects the history of continuing education as an "extension" experience which includes taking learning to others and addressing issues of social justice (McLean & Carter, 2013). Finally, it is proposed that the responsive design of the course is an act of social responsibility and design-led innovation (Thorpe & Gamman, 2011) in a complex time involving human health and the role of caregiving in getting through a pandemic.

Case Study 2 Current Issues in Indigenous Relations: Nehiyaw (Cree) Teachings and Critical Thinking

This second case study explores the use of instructional design and teaching as a political act (Janes et al., 2020; Turner, 2010). Dominant cultural assumptions are confronted as those who previously were not the designers (Elders and Knowledge Keepers) become part of the "relational design of learning activities that teach and reflect reconciliation" (Makokis et al., 2017, p. 4).

In response to historical injustice in Canada (the Residential School System) toward First Nations, the TRC (Truth and Reconciliation Commission of Canada) was formed on June 2, 2008 (Truth and Reconciliation Commission of Canada: Calls to Action, 2015). As Janes et al. (2020) noted, "… promoting 'reconciliation' requires not only learning about Canada's colonial past and its intergenerational impacts, but also creating spaces and places within the academy that bring equity and value to Indigenous knowledge systems and expanding appreciation for the role Indigenous knowledge and traditional ways of learning contribute to social and environmental sustainability" (p. 855).

This space "within the academy" was created by an Indigenous Scholar who was also a member of the Faculty of Extension at the University of Alberta in Edmonton, Alberta, Canada. During a class in 2016 teaching with an Elder at a local Tribal College, she noted the low engagement and disconnection of her learners who were also Indigenous (Makokis et al., 2017). The conversations with the Elder to find ways to engage their learners, and the acknowledgement that this disengagement had historical roots, were the impetus for a course they created in 2017 and resulted in the first offering of a course called EXARE 4655, Current Issues in Indigenous Relations: Nehiyaw (Cree) Teachings and Critical Thinking in 2018. This course was among the earliest efforts to try to comprehend Nehiyaw (Cree) teachings and knowledge using a Western academy lens and the academic concept of critical thinking (Beckie et al., 2017).

During the design, the Indigenous Scholar and the Elder who were collaborating on this project had access to a non-Indigenous instructional designer. In traditional instructional design, especially with a designer trained in Western design, the usual relationship between subject matter expert and the ID is often predicated on a client/expert engagement: client with a problem that needs an instructional solution; designer as a pedagogue who can offer advice and support. As Janes et al. (2020) suggest, this relationship to support Indigenous spaces in the academy requires "the balance of design agency [to shift] from the all-knowing designer who creates things that are good for passively grateful consumers, to a dialogue in which an emerging design democracy turns the designer into conversationalist, facilitator, mentor, pedagogue, and learner" (p. 859).

Designing as an act of reconciliation (inherently a political act that demands acknowledgement and change for past action, going forward) plays through tensions between historical roles and contemporary expectations, and is appropriate for the relational design of learning activities that teach and reflect reconciliation (Makokis et al., 2017). In this case, the designer was an active learner and the

teachers/clients, who were Elders and Knowledge Keepers, became designers (Janes et al., 2020, p. 859).

Overwhelmingly, this design path was "framed by settler/ally relations and the notion of 'collective lift' written about by Fletcher and others" (Fletcher et al., 2017; Rice & Snyder, 2012). The path for instructional design to be ally-supporter and listener, and for Elders and Knowledge Keepers to bring Indigenous knowledge to the academy and the design as leaders of the process, is to be "… ethically aligned with Indigenous knowledge creation, a lifelong process, starting and staying grounded in community with Elders and other Knowledge Keepers" (Janes et al., 2020, p. 864).

From a critical instructional design perspective, this work resisted "…traditional approaches to instructional design, born out of technical writing and training lineages, that rigidly define design processes and outcomes'' (Collier et al., 2016, para. 3). Collier et al. go on to say that "instructional designers too must embrace, examine, be affected by openness, and relish the uncertainty openness creates in our work" (para. 3). While their specific focus in their work was "openness" with respect to digital instructional design, we argue that, if we redefine their openness to be aligned with cultural humility, design justice, and a willingness to be open to the precepts of critical instructional design, the argument holds. Just as "cultural humility is the keen awareness of how culture shapes all individuals' experiences and perspectives, including the impact of power, privilege, and oppression" (Fisher-Borne et al., 2015 quoted in Fisher, 2020), "cultural humility and social justice [are]…related constructs, given that many social injustices occur within the context of cultural diversity…" witnessed by the lived experiences of First Nations Peoples. Critical instruction design, through social action and cultural humility, creates a space to allow the designer "…to become more fully aware of social injustices and to actively engage in socially just practice" (Fisher, 2020, para 2). In addition, design justice is "…design work that centers and prioritizes people who have been marginalized by design" (Collier, 2020, para 6; Constanza-Chock, 2020). Design justice and cultural humility are just two ways the instructional designer can move beyond the traditional and into the critical.

Given the context of the First Nations Peoples within the construct of the country of Canada, shifting this learning lens to include Indigenous knowledge creation and understanding is a political act. In addition, the course made critical pedagogy/critical design the overarching commitment to the reconciliation process, led by our Indiginous colleagues and communities, and as such, had the opportunity to make critical change in both futures (Janes et al., 2020, p. 864).

Final Thoughts

The turn to lifelong and professional learning opportunities has resulted in learning communities that are diverse in age, educational background, sociocultural experiences, gender and sexual orientation, financial security, social mobility, career

trajectories and expectations, and geopolitics. As discussed earlier, continuing education in Canada has long been framed by concerns for social justice; the Antigonish movement in Nova Scotia (Haughey, 1998) and current efforts to align with community engaged scholarship and praxis are two examples. In our combined experience, we have observed that many instructional designers are often employed by Canadian continuing education units in higher education; hence, these units are fertile grounds for development of the values and approaches explored in this paper.

Critical instructional design (CDI) plays an important role in this discussion. Initially, CDI was seen as "… an early, emerging attempt to get at some concrete methodologies for creating agentive spaces in online and hybrid learning environments" (Morris, 2017, para. 20) while "[t]he critical instructional design approach prioritizes collaboration, participation, social justice, learner agency, emergence, narrative, and relationships of nurture between students, and between teachers and students" (Morris, 2017, para 22).

According to Morris and Stommel (2017, para. 4),

> Critical instructional design [became] an approach to course, assignment, and assessment design that privileges student agency, inquiry, and emergence. Although critical instructional design deals primarily with online and hybrid learning spaces, its practice is appropriate for on-ground classroom teaching as well, especially where technology and digital learning may intersect with traditional learning. A critical instructional designer…not only assists with or manage[s] the design of learning and teaching in a learning or content management system, but also considers the pedagogical practices most effective at encouraging student agency.

The two case studies embody the conjunction of CDI with social action: The first case study engaged in critical pedagogy and CDI to underline the needs of the learners and enable their agency as caregivers while learning in an online space during a life threatening global crisis. The second case study, that of Indigenous voices being afforded content expert, pedagogue, and designer roles as a political act, also embodies the CDI approach to social action, design justice, and cultural humility; "[i]mportantly, in keeping with its social justice roots, critical instructional design seeks to create learning and educational opportunities for students of all backgrounds, leveraging techniques especially to give platforms for those voices most usually suppressed or oppressed…and aims for the fullest inclusion possible" (Morris, 2017, para 23) while in a more classroom-based, traditional space.

Recognizing that learning itself is a form of acculturation, the question for critical instructional designers is how to design for learning experiences that respect, accommodate, and celebrate diversity, collaboration, stories, and social justice. Germain-Rutherford and Kerr (2008) propose adopting cognitive models and learning theories that favour inclusiveness; recognizing the plurality and cultural diversity of learning contexts and students; and designing learning and evaluation activities that are consistent with culturally inclusive pedagogical goals and approaches (p. 76). These suggestions are self-evident, their implementation less so. Graduate curriculum redesign and experiential learning experiences that include reflexive practice and participatory design are two considerations. We have also advocated for identity work for students and practising designers alike.

What might inclusive design and design justice look like? According to Collier (2020, para.7), "Working toward inclusive design and design justice involves listening to learners, being willing to learn sometimes hard and painful lessons, and adjusting designs based on learners' input. This process can be overwhelming, especially if there is little or no institutional support." We argue that this includes learners and goes beyond learners to their communities, elders, and history as well as into change agency within the instructional design space. Formal education in unconscious bias, autobiographical writing, and critical autoethnography are promising approaches, especially when considering critical incidents and identity jolts encountered in one's academic or professional life that lead to perspective transformation (Bandura, 1977; Mezirow, 1991; Mezirow & Taylor, 2009).

Appendix 1: Design Principles Used in Infection Prevention and Control Course

Equity	Accessible to a variety of learners including older and younger learners, English as Second Language (ESL) learners, and caregivers from diverse backgrounds
	No complex logins
	Accommodation of the technological skills (or lack thereof) of learners
	Approaches to design reflecting equity for all learners; examples include use of glossaries and images, translation of complex ideas and health care jargon into plain language
Flexibility	Multiple learning pathways: Learners can take the course in full or "pick and choose" modules or sections that meet their needs.
	Learners can print materials such as glossaries and infographics for future access.
	Short modules (30–50 min) with opportunities for consolidation of learning.
	Learners progress at their own pace.
Simplicity and Intuition	Modules are easy to follow and leverage a different media including text, video, images, and infographics.
	Quizzes are directly embedded within modules.
	Content is a blend of curated content and content created by subject matter experts.
Value	A blend of healthcare expertise with the needs and wants of caregiver-learners.
	Concrete takeaways.
	Visual energy to sustain motivation.
	Timeless but timely, e.g., care of loved ones is a reality across all societies and time periods although it especially timely in Canada today; viruses will be with us forever and, hence, a course with a focus on IPAC during a pandemic has value now and, in the future,
	Valuable for the general public in addition to caregivers and families.

Caregiver Consultations (2020), Daniel (2016), and de Bie and Brown (2017)

References

Adams, J. (2018). Editorial: Art and design as agent for change. *International Journal of Art & Design Education, 37*(4), 558–559.

Adelman, R., Tmanova, L., Delgado, D., Dion, S., & Lachs, M. (2014). Caregiver burden: A clinical review. *JAMA, 311*(10), 1052–1060. https://doi.org/10.1001/jama.2014.304

Allin, S., Marchildon, G., & Peckham, A. (2020). *International healthcare systems profiles, Canada*. Retrieved from: https://www.commonwealthfund.org/international-health-policy-center/countries/canad

Apple, M. W. (2011). Paulo Freire, critical pedagogy and the tasks of the critical scholar/activist. *Revista e-curriculum, 7*(3), 1–21.

Bakas, T., Austin, J., Jessup, S., Williams, L., & Oberst, M. (2004). Time and difficulty of tasks provided by family caregivers of stroke survivors. *Journal of Neuroscience Nursing, 36*(2), 95–106.

Bandura, A. (1977). *Social learning theory*. Prentice Hall.

Banerjee, B. (2008). *Designer as agent of change* [Paper Presentation]. A vision for catalyzing rapid change: Changing the change conference, Torino, Italy.

Beckie, M., Fletcher, F., Gruezmacher, M., Hibbert, A., Innes, T., Janes, D., Krogman, N., Makokis, P., & Wilson, S. (2017, April). *We are all related: Reconciliation, engagement, and lifelong learning through Indigenous knowledge sharing* [Conference presentation]. Universities Association for Lifelong Learning Annual Conference 2017, York, United Kingdom.

Campbell, K., & Janes, D. (2021). Myths, metaphors, and the master narratives of instructional design: Counterstories and alternatives. *The International Journal of Design in Society, 15*(1), 231–252.

Campbell, K., Schwier, R. A., & Kenny, R. F. (2009). The critical, relational practice of instructional design in higher education: An emerging model of change agency. *Educational Technology Research and Development, 57*(5), 645–663.

Campione, J., & Zebrak, K. (2020). Predictors of unmet need among informal caregivers. *The Journals of Gerontology: Series B, 75*(10), 2181–2192.

Canadian Association for University Continuing Education. (2021). https://cauce-aepuc.ca/index.php

Caregiver Consultations. (2020, November). *Conducted by instructional designer from McMaster University Continuing Education for infection prevention and control course project*. McMaster Continuing Education. Hamilton, ON, CA.

Carter, L., & Janes, D. P. (2021). Linking the past, present, and future of Canada's University continuing education units: A conceptual paper for post-pandemic times. *Canadian Journal for the Study of Adult Education*. https://cjsae.library.dal.ca/index.php/cjsae/index

Carter, L., & Rukholm, E. (2009). Partnering with an Aboriginal community for health and education. *Journal of University Continuing Education, 35*(1), 45–60.

Carter, L., Rukholm, E., & Newton-Mathur, D. (2009). Interprofessional collaboration and culturally-safe Aboriginal health care. *Journal of Distance Education/Revue de l'Éducation à Distance, 23*(2), 137–146.

Carter, L. M., Hanna, M., & Warry, W. (2016). Perceptions of the impact of online learning as a distance-based learning model on the professional practices of working nurses in Northern Ontario. *Canadian Journal of Learning and Technology, 42*(3). Retrieved from https://cjlt.ca/index.php/cjlt/article/view/27472

Chan, P. C. W., Morissette, R., & Qiu, H. (2020). *COVID-19 and job displacement: Thinking about the longer term*. Statistics Canada, Government of Canada. Retrieved from https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00030-eng.htm

Charlton, J. I. (1998). *Nothing about us without us: Disability oppression and empowerment*. University of California Press.

Chau, A. (2020). Feminist activist storytelling: Transforming identity and building resistance. *Canadian Journal for the Study of Adult Education, 32*(2), 91–101. Retrieved from: https://cjsae.library.dal.ca/index.php/cjsae/article/view/5590

Collier, A. (2020). *Inclusive design and design justice: Strategies to shape our classes and communities*. Educause Review. Available from https://er.educause.edu/articles/2020/10/inclusive-design-and-design-justice-strategies-to-shape-our-classes-and-communities

Collier, A., Morris, S. M., & Slay, A. (2016). *Critical design and open education*. Presentation to Open Education, 2016. Richmond, VA, United States. Available from https://openeducation2016.sched.com/event/7los/critical-instructional-design-and-open-education

Conrad, D., & Wardrop, E. (2010). Exploring the relationship of mentoring to learning in RPL practice. *Canadian Journal for the Study of Adult Education, 23*(1), 1–22. Retrieved from https://cjsae.library.dal.ca/index.php/cjsae/article/view/25

Constanza-Chock, S. (2020). *Design justice: Community-led practices to build the worlds we need*. MIT Press.

Daniel, J. (2016). *Making sense of flexibility as a defining element of online learning*. Contact North/Contact Nord. https://teachonline.ca/tools-trends/exploring-future-education/making-sense-flexibility-defining-element-online-learning

de Bie, A., & Brown, K. (2017). *Forward with FLEXibility: A teaching and learning resource on accessibility*. McMaster University Pressbooks. Retrieved from https://flexforward.pressbooks.com/

Deniz Çetin, Ö., & Aryana, B. (2015, April). *An analysis of the influence of design activism and socially responsible design approaches on design education.* [Paper Presentation] 11th European Academy of Design Conference.

Fisher, E. S. (2020). Cultural humility as a form of social justice: Promising practices for global school psychology training. *School Psychology International, 41*(1). Available from https://journals.sagepub.com/doi/full/10.1177/0143034319893097, 53–66.

Fisher-Borne, M., Montana Cain, J., & Martin, S. L. (2015). From mastery to accountability: Cultural humility as an alternative to cultural competence. *Social Work Education, 34*(2), 165–181. https://doi.org/10.1080/02615479.2014.977244

Fletcher, F., Hibbert, A., & Hammer, B. (2017). Debriefs as process evaluation for community well-being: Community-based participatory research with Metis settlements in Alberta, Canada. In R. Phillips & C. Wong (Eds.), *Handbook of Community Well-Being Research* (pp. 99–114). Springer.

Freire, P. (2004). *Pedagogy of indignation*. Paradigm Publishers.

Fry, T. (2011). *Design as politics*. Berg.

Fuad-Luke, A. (2009). *Design activism: Beautiful strangeness for a sustainable world*. Earthscan.

Ganguly, A., Talukdar, A., & Chatterjee, D. (2019). Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization. *Journal of Knowledge Management, 23*(6), 1105–1135.

Germain-Rutherford, A., & Kerr, B. (2008). An inclusive approach to online learning environments: Models and Resources. *Turkish Online Journal of Distance Education, 9*(2), 64–85. https://www.heacademy.ac.uk/system/files/resources/TEL_report_0.pdf

Guo, S., & Liu, J. (2021). Taking Stock of Research on Immigration and Adult Education in Canada: 1981–2020: 1981–2020. *Canadian Journal for the Study of Adult Education, 33*(2).

Haughey, D. (1998). From passion to passivity: The decline of university extension for social change. In S. M. Scott, B. Spencer, & A. M. Thomas (Eds.), *Learning for life: Canadian readings in adult education* (pp. 200–212). Thompson.

Heavey, K., & Jemmott, K. (2020). Cinders. *Canadian Journal for the Study of Adult Education, 32*(2), 103–119. Retrieved from https://cjsae.library.dal.ca/index.php/cjsae/article/view/5591

Hooks, B. (1994). *Teaching to Transgress*. Routledge.

Janes, D. P., Makokis, J., & Campbell, K. (2020). Reconciliation as design: A design case. In M. J. Bishop, E. Bolling, J. Elen, & V. Svihla (Eds.), *Handbook of research in educational communications and technology: Learning design*. Springer.

Johnson, J. R. (2004). Universal instructional design and critical (communication) pedagogy: Strategies for voice, inclusion, and social justice/change. *Equity & Excellence in Education, 37*(2), 145–153. https://doi.org/10.1080/10665680490453995

Judge, K., Bass, D., Snow, A., Wilson, N., Morgan, R., Looman, W., & Kunik, M. (2011). Partners in dementia care: A care coordination intervention for individuals with dementia and their family caregivers. *The Gerontologist, 51*(2), 261–272.

Kops, W. J. (2020). Older adult education. *Canadian Journal for the Study of Adult Education, 32*(1). Retrieved from: https://cjsae.library.dal.ca/index.php/cjsae/article/view/5480

Makokis, J., Campbell, K., Steinhauer, D., & Janes, D. (2017, June). *We are all related: Course design for reconciliation: Indigenous teachings Nehiyaw (Cree) and critical thinking*. IAFOR conference (1–13). IAFOR conference, Brighton, United Kingdom. Retrieved from: https://papers.iafor.org/submission36491/

McLean, S., & Carter, L. (2013). University continuing education for adult learners: History and key trends. In T. Nesbit, S. M. Brigham, N. Taber, & T. Gibb (Eds.), *Building on critical traditions. Adult education and learning in Canada*. Thompson Educational Publishing.

Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.

Mezirow, J., & Taylor, E. W. (2009). *Transformative learning in practice: Insights from community, workplace and higher education*. Wiley.

Mizzi, R. (2020). New directions, new provocations. *Canadian Journal for the Study of Adult Education, 32*(1). Retrieved from https://cjsae.library.dal.ca/index.php/cjsae/article/view/5570

Morris, S. M. (2017). A call for critical instructional design. *Blog*. https://www.seanmichaelmorris.com/a-call-for-critical-instructional-design/

Morris, S. M. (2018). Chapter 19: Critical instructional design. In S. M. Morris & J. Stommel (Eds.), *An urgency of teachers: The work of critical digital pedagogy*. Hybrid Pedagogy Inc.

Morris, S. M., & Stommel, J. (2017, October). *Critical Instructional Design Workshop*. University of Warwick. https://docs.google.com/document/d/1ly1qXgiXbDx_9CqSOQ9SHySQbM032fbNN9dnqI2OoCw/edit#

Morris, S. M., & Strommel, J. (2018). Chapter 1: Critical digital pedagogy: A definition. In S. M. Morris & J. Stommel (Eds.), *An urgency of teachers: The work of critical digital pedagogy*. Hybrid Pedagogy Inc.

Nesbit, T. (2011). Editorial: Keeping the flame alive. *Canadian Journal for the Study of Adult Education, 23*(2), ii–vi. Retrieved from https://cjsae.library.dal.ca/index.php/cjsae/article/view/949

Parker, K., Minkin, R., & Bennett, J. (2020). *Economic fallout from COVID-19 continues to hit lower-income Americans the hardest*. Pew Research Centre. Retrieved from https://www.pewsocialtrends.org/2020/09/24/economic-fallout-from-covid-19-continues-to-hit-lower-income-americans-the-hardest/

Parrish, P., & Linder-VanBerschot, J. (2010). Cultural dimensions of learning: Addressing the challenges of multicultural instruction. *The International Review of Research in Open and Distributed Learning, 11*(2), 1–19.

Ranelli, P., & Aversa, S. (1994). Medication-related stressors among family caregivers. *American Journal of Hospital Pharmacology, 51*(1), 75–79.

Rice, B., & Snyder, A. (2012). Reconciliation in the context of a settler society: Healing the legacy of colonialism in Canada. In M. DeGagné, J. Dewar, & G. Lowry (Eds.), *"Speaking my truth": Reflections on reconciliation & residential school* (Scholastic Edition/First Printing. ed.). Aboriginal Healing Foundation.

Rotarou, E., Sakellariou, D., Kakoullis, E. J., & Warren, N. (2021). Disabled people in the time of Covid-19: Identifying needs, promoting inclusivity. *Journal of Global Health, 11*(1).

Saunders, E. (2006, September). Design research in 2006. *Design Research Quarterly, 1*(1), 1–8.

Schulz, R., & Sherwood, P. (2008). Physical and mental health effects of family caregiving. *The American Journal of Nursing, 108*(9 Suppl), 23–27. https://doi.org/10.1097/01.NAJ.0000336406.45248.4c

Shan, H. (2015). Women, Gender, and Immigrant Studies: State of the Art in Adult Education in Canada. *Canadian Journal for the Study of Adult Education, 27*(2 SE), 46–63. Retrieved from https://cjsae.library.dal.ca/index.php/cjsae/article/view/3416

Souleles, N. (2017). Design for social change and design education: Social challenges versus teacher-centred pedagogies. *The Design Journal, 20*(Sup.1), S927–S936. https://doi.org/10.1080/14606925.2017.1353037

Statistics Canada. (2021). *Caregivers in Canada*. Retrieved from https://www150.statcan.gc.ca/n1/daily-quotidien/200108/dq200108a-eng.htm

Taniguchi, Y., Miyawaki, A., Tsugawa, Y., Murayama, H., Tamiya, N., & Takahiro, T. (2021). Family caregiving and changes in mental health status in Japan during the COVID-19 pandemic. *Archives of Gerontology and Geriatrics, 98*(104531).

Thorpe, A., & Gamman, L. (2011). Design with society: Why socially responsive design is good enough. *CoDesign, 7*(3–4), 217–230.

Truth and Reconciliation Commission of Canada: Calls to Action. (2015). *Honouring the truth, reconciling the future: Summary of the Final Report of the Truth and Reconciliation Commission of Canada*. Retrieved from http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Exec_Summary_2015_05_31_web_o.pdf

Turner, J. (2010). Teaching is a political act. *Teacher Newsmagazine, 23*(2). British Columbia Teachers Federation. Retrieved from https://bctf.ca/publications/NewsmagArticle.aspx?id=21678

Designing in Pursuit of Liberation

Terresa Moses

Statement of Unity

The University of Minnesota Twin Cities is located on traditional, ancestral, and contemporary lands of the Dakota People ceded in the Treaties of 1837 and 1851 (Institute for Advanced Study, n.d.). I am committed to recognizing the complex history of this land by honoring the truth of violence, displacement, migration, and settlement that bring us together. I acknowledge and fight against the legacy of white supremacy and the culture of anti-Black racism, which has led to the murders of Philando Castile, George Floyd, Daunte Wright, Winston Smith, and countless other Black Americans across this nation. Black lives matter. I stand with our Hmong,[1] Asian, Asian-American, and Pacific Islander communities against the rise of xenophobic violence since the start of the COVID-19 pandemic. I recognize that words are not enough and I remain committed to the work of eradicating the injustices against all Black, Indigenous, and people of color caused by systemic racism.

[1] According to the Minnesota Historical Society, there are more than 66,000 Hmong in Minnesota, and the Twin Cities metro is home to the largest concentration of Hmong in America.

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Designing in Pursuit of Liberation

If liberation was easy, we would no longer live in a community where people lived oppressive and marginalizing lives. Anti-oppressive work takes commitment, passion, and a community of support. When many of us think about social justice, it is a huge, super-complex, super-nuanced topic and people do not necessarily know where to start. One of the ways to begin the journey of infusing social justice and social change into the various parts of one's life is to start understanding who you are and how you show up to this work. Introspective work, like continued learning and self-assessment, is a great way to increase cultural understanding.

The Social Change Ecosystem[2] is an introspective assessment created by Deepa Iyer, an academic and community organizer (Iyer, 2021). This model and the activities associated with it allow anyone to understand where their strengths lie, specifically in the context of community and organizing for social change. I invite and encourage you to look up the model, review the associated questions and begin understanding perhaps how you show up in the ecosystem of change. Personally, I am a disrupter (I take on uncomfortable and risky actions to shake up the status quo, to raise awareness, and to build power) and a builder (I develop, organize, and implement ideas, practices, people, and resources in service of a collective vision). It took a while for me to understand the roles I was made for rather than the ones I was thrust into while doing this type of work.

For instance, you may think that as a designer you are a storyteller (you craft and share your community's stories, cultures, experiences, histories, and possibilities through art, music, media, and movement) or as an educator you are a guide (you teach, counsel, and advise, using your gifts of well-earned discernment and wisdom). Your design or academic capabilities and the way in which you create or disseminate information can fall into any one of the nine categories shown on the map. So those are where my two strengths lie—in the disrupting and building roles—and this is how my work shows up. Whenever I am organizing within my community, I like to create a team where we have most of these areas covered because a lot of these are going to help us when we are trying to pursue liberation within our community.

Liberation

When I speak about liberation, many folks will agree that there are going to be a million and one different ways to define it. I would encourage you all to seek what liberation actually means, but for the sake of my presentation, I have broken down the word "liberation" into three different areas. The first being abolition– the

[2] Deepa Iyer, SolidarityIs and Building Movement Project. Questions? Please contact Deepa via email (diyer@buildingmovement.org), on Twitter (@dviyer), or on Instagram (@deepaviyer).

abolition of many different systems. The second area is reparations– to not only remove the oppressive system, but then repair and make whole the communities harmed. And then, lastly, how can we use design in the pursuit of these two categories to equal liberation?

Abolition

> Becoming an abolitionist is a constant commitment. It is the acknowledgment that our societal institutions are still reliant upon the ideas, functions, and frameworks of slavery. – APRÈS, Blackbird Revolt (Moses & Moses, 2020)

Abolition is not simply referring to the tearing down of the prison industrial complex or the system of policing. We should be thinking about and addressing all systems that are set up to oppress and marginalize, including our education system, the design industry, and our hiring practices. All of these systems were founded on systemic racism. At this very moment, the College of Design at the University of Minnesota is working on a cluster hire in the area of Design Justice. We are looking to hire faculty who are specifically looking at systemic racism in the design area. If we as an institution are looking to radically shift the status quo in the field of higher education, we need to consider our hiring practices and our pedagogy: How are we considering decolonization practices in these areas? Abolition in the broad sense can become overwhelming very easily because there are so many systems founded on oppression. Which one do we start with first?

And then lastly, the area of "diversity, equity, and inclusion" (DEI) is another place which needs abolition-like thinking. As the inaugural Director of Design Justice at my institution, I recognize that this work has to be done differently. We cannot just continue to hire one person and expect them to handle all of our racist, sexist, and ableist issues. DEI should be a collective effort. This is why I created the Design Justice Collective. Unlike the committee format which forces involvement and representation from every program in the college (even if they do not want to participate) the Collective is set up as a voluntary group of individuals who are already engaged in justice-centered work and will support each other to further our anti-racist agenda. This collective model is a way to tackle the one DEI position problem. This is just one method to help ingrain anti-racist work into every aspect of the college, making these issues everyone's problem. We work together to ingrain anti-racist and anti-oppressive methods into all of our practices and policies throughout the whole college, hopefully touching those same issues that exist within the design industry.

As an educator, I integrate abolition thinking into many areas of education. Using design to be able to educate and talk about issues of race and racism is very important to the progress of our communities. Last year, when George Floyd was murdered, I was still living in Duluth. I had been working at the Duluth campus since Fall of 2016. I worked (and work) a lot within the community and used my design skills to help tell messages and share stories. One of those messages being about the

work and theology of Martin Luther King, Jr. (MLK). MLK Day in January was one of the largest events that we hosted every year through the Duluth NAACP. Being able to talk about MLK as more than the digestible "I have a dream" is quite radical. As a community, we are not as educated on all of the concepts that he would introduce, especially right before he was murdered. One of the ways in which I would tell some of the stories of MLK was using his speeches as the theme for the MLK Day events which we hosted. The example shown here from 2019 is themed "The Current Crisis In Race Relations." Based on the theme chosen for that year, I would use design to help create and tell that story. The image I illustrated is a hand pulling down another hand into this orange mass. The color significance in this piece speaks to us as people (in blue) and the mass of orange being systemic racism, which pulls all of us down into it. This series of illustrations is a sequence: (1) racism pulling us down, (2) our communities coming together in healing, and (3) standing together in the fight– each illustration with less and less of the orange mass being shown. The following photo is what that looks like in reality, when we as a community meet each other to support MLK's message. This was the largest MLK rally organized in Duluth. Being a part of the organizing of this event is just as integral as designing the messaging behind it. Oftentimes, as educators and researchers, we stop at the theory piece, but we have to abolish that way of thinking. We cannot allow the system of standards within academia to separate us from the community we are a part of. Change is more than publishing an article on a topic; it is making it accessible, reaching out to service our communities, and passionately organizing for what we know is right.

Continuing in this same vein of accessible and community-centered education when George Floyd was murdered, I assisted young people in Duluth in the planning of a Juneteenth event meant to celebrate our freedom alongside the memorialization of those who have had their lives stolen due to police brutality, once again, using design to help send messages to work with youth and using design to help organize for these causes. It was the largest anti-racist march and protest that Duluth had ever seen, with over 2000 people in attendance. I was honored to be a part of not just the branding but actually hand-in-hand with community members.

And, finally, shortly after I arrived in the Twin Cities, we had another murder of an unarmed Black man, Daunte Wright. Many times, the way I process the pure hatred that systems of oppression have for people that look like me is through design. I created my own type, which you see here, to create messaging that unified what we were fighting for. After my work was shared across social media, I brainstormed how I might make these messages more accessible to the community, so I printed 300 hoodies with the "Stop Killing Black People" message that I designed and passed them out for free at the protests in Brooklyn Center. I know I will address reparations shortly; however, I used this opportunity to address that as well. So when my friends and I passed out the hoodies, signs, and buttons we quite literally said "Free to Black people, donation of any amount requested for anyone else." I printed 900 hoodies, 1500 t-shirts, 2600 buttons, and 800 waterproof signs. And with the help of my community, we showed up at protests in April, May, and June

to distribute them to the community of protestors. I also engaged at every protest, once again, abolishing this thinking of theory and research as unactionable.

Design can be super powerful at telling messages of passion, liberation, and demand. Design can also be used as a tool that unifies the community. It is something we can latch on to together. Having a unified message is so important to the movement. The photographs that follow are images of my designs in the hands of community members, at protests, demanding justice for these stolen lives. Also, community members took on those images and began applying them to their own crafts. My friend and talented sign maker Kelsi Sharp created these huge banners to place outside police stations. And when Black Fashion Week happened recently, some folks were, like, "Hey, can we use your work?" And I was, like, "Absolutely!" And so you can see here where this designer screen printed the design on this custom jacket. And then, also, I had to throw this in here because Common the rapper came up to me during the anniversary event of George Floyd's murder. He put on my shirt, and he wore it on stage. And it was awesome to watch how these designs and the message/unification that they represented traveled.

Reparations

> Our three elements of reparations [acknowledgment, intervention, and restoration] help hold us to our vision of Black liberation. –Black Liberation Lab

What does it look like to address the repairing of our communities? Black Liberation Lab is a small group of Black organizers in Duluth who have established three elements of reparations; (1) acknowledgement, (2) intervention, and (3) restoration. They have defined these three areas specific to their vision of Black liberation. In conjunction with this ideal of reparations, I focus on how to specifically pursue Black liberation through creative methods. I am very passionate about this and know that the research specific to this intersection, design and reparations, is minimal. One thing for sure is that if we are to design in pursuit of reparations, we must consider those at the margins of the margins (Crenshaw, 1991). If we center our design and educational efforts on those with intersectional experiences, we will positively affect all levels of oppression.

Reparations is repairing and writing the wrongs of the past. Previously when I mentioned that we gave out protest gear "free to Black people," although small in impact, I am essentially addressing a shift in wealth and funds to different parts of our communities. Reparations are about protection and healing. Where in our communities do Black people and marginalized individuals feel protected? What does healing actually look like when we center Blackness? What kinds of Black spaces exist in our cities? There are very few Black spaces or spaces where people of color feel like they can be safe. So, what does that look like? Thirdly, accountability practices. How are we holding people accountable, not just cancelling them? Because Cancel Culture is super toxic, how do we go past initial harm and down to root

causes to attached generational trauma and seek change? How do we actually put transformative justice into practice in a way that allows us to reintegrate people back into our communities and really create a whole unit moving toward this idea of liberation? And lastly, validation. This concept is so important when we are repairing harm. Racial gaslighting invalidates the experiences of Black people and other people of color. Being able to feel validated in your experience of oppression is an important piece to being able to feel like you belong in community.

Justice isn't fair. It's right.

This is a phrase that I like to talk about when I address hard topics like reparations. Oftentimes those who do the oppressing and/or benefit from white supremacy don't feel like writing a check to communities they have harmed. It feels unfair to them. It feels as though they are missing out on this opportunity. The thing is, the United States has paid reparations to many different communities of people. And yet, it still has not addressed the Black community. This phrase is one that I will repeat because, you are right, it is not fair. Nothing about oppression is fair, but reparations– justice– is right. And that's what we should be striving for– the right thing to do to get us to liberation.

One of the ways in which I pursued this issue is with an exhibition I created called Umbra. In this exhibition, I specifically talked about intersectionality. If you live on the margins of the margins, how do we help solve that? Umbra was an exhibition that specifically talks about the Black woman's experience. I created digital illustrations, had them screen printed, and created a whole experience based on some of the themes that are present in a Black woman's life experience. In the exhibition itself, I created a two-way lens of experience. If you were a Black woman, my goal was to have you feel validated, and that you had a voice to contribute to the experience. If you were not a Black woman, while you were able to experience the show, it was in a "Here is what you need to do" type of way. I had six themes throughout the exhibition; (1) gaze, (2) control, (3) savior, (4) (d) anger, (5) burden, and (6) liberation. These themes were then accompanied with an actual physical piece that people were able to interact and engage with. For example, when I talked about gaze, I created a 360 video which turned into a virtual space of white people staring at you. I communicated this particular theme and experience in a shocking way, which allowed for conversation and empathy building as a result. For the theme of control, I had these building blocks which I had painted the words "sexism," "classism," and "racism" on. The activity was to get the mannequin to hold all three building blocks, essentially controlling how Black women hold these oppressive concepts. For the theme of savior, I had some black tissues which you were supposed to grab to address your white tears. For the theme of "danger or anger," you were to put on headphones and basically hear me yelling the description of that concept into the mic. The theme of burden included a weighted vest in which I hand-painted words on the individual weights which you placed inside the vest pockets. So words like "sexism" and "microaggression" began to weigh more and more as they were paired with the other elements of anti-Blackness and misogynoir. Once you placed all the weights into the vest, it was 50 pounds of intersectional

oppression. Lastly, the theme of liberation included Legos with which people could work together to build a world that truly valued and centered Black women. And just like the exhibit had two lenses/descriptions for each piece, so did the correlating zine. One side was meant to validate the experiences of Black women, asking for their contribution to the zine, and the other side was meant as a message for those who were not Black women to listen to. The photos shown here is the opening night of the exhibition– bringing the community aspect into my design work and asking myself "How do we center Black women?" And so if you've been to Duluth, Minnesota, you will know that the percentage of Black people is about 2%. And so seeing this many Black people in a room was amazing.

Design

> Like all systems, systems of oppression, inequality, and inequity are by design. Therefore, they can be redesigned. –Antionette Carroll, Creative Reaction Lab

Lastly, I would like to address design, especially in the classroom. To all of you here today, please understand that we all have the power and responsibility to use design to help us redesign these systems of oppression. So when I think about design, I think about design research and how those methods and theories influence my work as a designer and educator. The design research process has five iterative steps, the first one usually being "empathy." You see here that I have crossed out the first step of that process and renamed it "context." The reason I renamed this step is that if we are waiting for everyone to gain empathy, we will be waiting forever to solve a problem that is killing us now– racism. My logic is that if you could just build a bit of context, we can at least move forward and empathy can be gained along the way. Move on from there. The second step is "define," which uses research methods to help you understand the situation– pulling case studies, etc. The third step is "ideate"– quite literally thinking of ideas. The fourth step is "prototype," which is creating better fidelities of those ideas. And the final step instead of "testing," when we are measuring the "impact" of that deliverable.

The project that I work on specifically using this redesigned research process is called "Racism Untaught," co-developed by Lisa E. Mercer and myself. "Racism Untaught" was initially created to be a tool for educators to help talk about racism in design education classes, but has since evolved to be used by our design industry partners like Target, Spotify, PayPal, many other design organizations. They use the framework to critically analyze their products and reimagine their design processes to use an anti-racist design lens. In the "Racism Untaught" toolkit, we define design as artifacts, systems, and experiences. We make sure that every participant, whether formally trained or not, is a designer. Each of these design areas are affected by people who hold up the system, so what can we do to reimagine our artifacts, systems, and experiences. So, we use that design research process to help us solve that, or, create approaches to solving these problems. Those five areas that I just

mentioned–context, define, ideate, prototype and impact– should never be considered "done," which is indicated by the gray dotted lines. This process is iterative and we are constantly changing and learning new ways to create a more just, liberation-centered experience with the community. Considering the Levels of Oppression is also an eye-opener for participants of the framework as we explain that what we should be striving for in liberation is a change in our culture. Changing our culture affects the institution, agentic action–how we treat each other, and our own personal beliefs about people. This is what the toolkit looks like, and if you're interested, you can go to racismuntaught.com to learn more about our work. We essentially have cards for each step that helps guide you through this process. These are photos of "Racism Untaught" in the works. This image here is a project in which students used the toolkit for 16 weeks and recreated the Aunt Jemima brand to Yours Truly, because it is no longer a Black woman cooking for you in the kitchen, it is Yours Truly.

Conclusion

So, I leave you with these questions: How are you designing for liberation? How are you involving the community in your work? How have you decided to prioritize equity, anti-racism, and anti-oppression in your work?

If you would like to reach me, email me at mose@umn.edu or reach out on social media @blackbirdrevolt or @projectnaptural. Thank you all for your time and sharing space with me today. And I'd love to open it up for any questions.

About the Keynote Presenter and Author

Terresa Moses (she/her) is a proud Black queer woman dedicated to the liberation of Black and brown people through art and design. She uses creativity as tools of community activism like her recent solo exhibition, Umbra.

Moses is the Creative Director at Blackbird Revolt –a social justice-based design studio– and an Assistant Professor of Graphic Design and the Director of Design Justice at the University of Minnesota. As a community engaged scholar, she created Project Naptural– a natural hair initiative centers the experiences of Black women– and co-collaborated to create Racism Untaught– an anti-racist design research framework.

She is currently a PhD candidate in Social Justice Education at the University of Toronto. And, she serves as a core team member of African American Graphic Designers (AAGD) and as a collaborator with the Black Liberation Lab.

Questions Yielded from Attendees

How does "designing for liberation" work in education as a whole? What are suggestions to move things forward and how can we bring that work back to the community?

So when I first got to Duluth, I decided that the education system kind of fails us here in the United States where we don't really talk about Black history, you know. We don't talk about other people's color. And so I wanted to make sure to involve that in the classroom, if I could. So you know, if you're teaching graphic design, one of the projects that I do is a poster project. And I specifically assign students a Black element, like experience, Black experience, piece to let you know, maybe it's at the bus boycott or something like that. But then I also assigned them a Black designer to be inspired by. And so what that does is it allows them to see not just all of the white designers that they're going to be, you know, given throughout like almost all of their courses, but allows them to open up that worldview and say, "Oh, there are other aspects of design in different areas." And so that's one way I can think about if you're doing architecture, really analyzing Robert Moses and some of the impacts that Robert Moses has had on our transportation and how the way our cities are set up. That's a really awesome way if you go to racism on tight, you'll see a case study that my colleague, Lisa Mercer, who I work on a project with, has done her classes around Robert Moses. So there are, I think, a plethora of ways to involve other design inspiration into courses. And often I feel people sometimes are just like, you know, they just don't think about it. And so I would encourage folks to start off by saying What other ways can we teach design that can involve different lenses, different experiences than the ones that you were taught? And so I would encourage folks to look deeper into their history.

How do we bring in guests of diverse backgrounds if we do not know, just by reading their work, what their identities are?

Yeah, so there's a ton of organizations that are specifically for black graphic designers, specifically for Asian American Pacific Islander designers. So I would use some of these membership organizations as resources to find different types of lenses and experiences of designers. Right now I sit on the core team of African American graphic designers, so if there's any event that comes up, I'm able to get in contact with my Black students, things like that. But I think that there are resources beyond what we just, like, see, and I think each segment I can think of right now, architecture, interior design, graphic design, those are just like the three that I think about in my head that have specifically people of color organizations that I think folks can turn to in order to bring speakers into courses or to assign people to be inspired by in their courses. So I think there are some organizations that you might be able to look at for some resources. And then, in education, I mean, there's always going to be a bio with a picture for an educator. So I would say, also, you can tap the shoulder of other educators at other institutions as well. And then some of the people that I just mentioned here in my presentation, Antoinette Carol, for example, who works

with a lot of fellowship programs specifically for BIPOC students. Those are the kinds of the networks that I'm plugged into. And so it's very easy for me, yes. But just stick your toe in and connect with some of these organizations. And I think that I'll help you and benefit you.

In teaching design, there can be a tension between empathy and savior-ism, as a savior myself, how do I address this? What do you do? Or if you do?

Sure, yeah, so when I do "Racism Untaught," I run it for the whole semester, before we actually run into the toolkit. There is a lot of onboarding work that I work with students, and I think, you as the educator, you do not have to be the expert on everything. So I want you all to kind of take that, you know, you don't have to be the expert on all of it. Bring people from your D.E.I. offices into your courses, run some self-assessments. You know, I have a lot of onboarding activities like this poem called "Where I'm From," and I have them specifically look at where the biases are. Where did you begin to learn some of these things? I'm very vulnerable in my classroom. So like, for me, you know, my family was very religious. And so when I think about homophobic thoughts, that's where they came from. And so we had a discussion about that. Where do we begin to learn things about people of color? Where do we begin to learn things about LGBTQ folks? Where do we begin to learn things about women, right? And so I have a whole onboarding, you know, like a week, 2 weeks in the course, where they're really just being very introspective, and I think that if we thought about design in that way, that you don't just go into a project and just leave all your identities behind, you don't. So let's just be upfront about it. Here's my identity, I am Black, I'm a woman, I am queer. I am middle class, I, you know, it's like I talk about all of those different identities, and then they're vulnerable enough to talk about those identities. And then we talk about how those shape our worldview, how they're going to shape what designs we begin to make. You know, if you don't have a disability, I bet you you're not thinking about disabilities in your design work. And so then like being able to think about that and be like, wow, you know, I'm a little ablest, and so I would say it is super important if you're going to start to address some of this stuff about how you know the power of design that people hold, you also have to address the identities that they hold that will absolutely bias their work. And so I would say that's specifically how I start off courses and then to attack savior-ism? What I will do there is if we're specifically looking at the Aunt Jemima project, for instance, that I showed, if we're specifically looking at how these five white students were redesigning this Black woman on a box. I specifically brought up questions that were like, What is the role of white people in this package design? They're continuing to consume this product. What's the role of whiteness? And so instead of saying, instead of framing it, where it's like, we have to help these Black people succeed, how about we help white people understand that what they're doing is perpetuating racism? And so I will turn stuff on its head. And again, that comes with experience. I don't expect anyone here to just go into the next class and be, like, we're going to talk about racism, you know. I don't expect that. But if you don't feel comfortable bringing other people into your courses, you can try looking to other departments. I hit up the philosophy

department all the time. There's always going to be someone who specializes in ethics that can come and talk to your course. If I'm talking about redesigning some products that were perpetuating ideas about indigenous people, I'm looking at my indigenous or Native American department. So I'm bringing other people so that you don't have to bear the weight of being the expert all the time. But bring them in, you know, and then it's like another expert talking about what you have been saying throughout the course. So I hope that helps.

In the field of instructional design and learning sciences, many models begin with determining competencies first. How should we critically address this way of beginning designed for inclusion and social justice and education?

Oooh so this, like, I could totally go on and about this, because I'm framing my dissertation right now. What does it look like if the foundation of design and competencies of design that we we're creating were centered on Black liberation? What could that look like? And so for me, it looks like, okay, I'm teaching, you know, an Adobe Illustrator course. Can we not address the fact that design is classist, and that design doesn't allow for folks who are at an economic disadvantage to join? So while I am teaching, you know, on these these programs, I can also address the fact that, hey, let'ss have a conversation about how design can be oppressive and not even allowing people to enter into that community, right? The projects that you start to give students, you know, like, oh, we're gonna learn how to create some shapes. Why can we look at W. E. Dubois' way of displaying information, and use some of that as a way to help us be inspired and learn the basics of design and information design. So those are the kinds of the things that I'm thinking about. And I think that it'd be easy to dive into that and use some of those other inspiration points from especially contributing people of color who contribute to design to help us think through some of the foundations of design. But I think that we can really start to be a little bit more critical. We expect our students to be critical, but I feel like we stop, we stop, because we think we're the experts in the room. We're the ones designing the course, you know, we're it and I think, I think we need to be a little more critical about how we're talking about things and not expecting just all this stuff from our students. Let's have conversation about it and be a little bit more vulnerable. And then I'll also say, I just want to add in there, the way that we set up courses, you know, think about that in a decolonial sense. Like, how do we say that, and I mean, even the way that we structure our rooms, right? We're up in the front, they're all over here. And it makes it seem like that their experiences actually can't even teach us anything. We're only the ones that can give information. So how do we even set up our rooms in a different way? How do we allow them to contribute to our courses? I mean, I have a ton of stuff on this. But how do we allow them to contribute and to have a say in what their grading looks like? Because even grading is super colonial? And it's super white supremacy? Like how do we begin to have conversations about that in our courses? So that's just some of the things I have without going on too much. But I hope that helps.

References

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review, 43*(6), 1241–1299. https://doi.org/10.2307/1229039

Hmong in Minnesota. Minnesota Historical Society. (n.d.). Retrieved October 19, 2021, from www.mnhs.org/hmong

Institute for Advanced Study. (n.d.). *IAS Land Acknowledgement*. Retrieved October 9, 2021, from https://ias.umn.edu/about/ias-land-acknowledgement

Iyer, D. (2021, May 5). *Social change ecosystem map*. Building movement. Retrieved October 19, 2021, from buildingmovement.org/our-work/movement-building/social-change-ecosystem-map

Moses, T., & Moses, J. (2020, June 24). *Après Zine*. Blackbird Revolt. Retrieved October 19, 2021, from https://blackbirdrevolt.com/apres/

Equity, Parents and Technology – Mother's Post-pandemic Perspectives of Children's Online Experiences during COVID-19

Dwan V. Robinson and Tracy Robinson

This research presents findings that are a part of a larger study that examines in-depth perspectives of Black mothers to learn about their experiences navigating their children's technology use while they juggled multiple roles of parent, employee, and online teacher/helper for their children during the first year of the COVID-19 pandemic.

The researchers in this phase of this inquiry interviewed three Black mothers to explore how they managed varied responsibilities and facilitated their children's use of technology when schools moved from in person learning to virtual learning at the start of the pandemic. Various on-going equity issues common to the use and exposure to technology, online modalities, and virtual interactions were exacerbated during year one of the COVID-19 period. Additional issues highlighted in this research relate to how these mothers grappled with problems regarding access to technology, use of technology (including devices, internet speed etc.), knowledge of the learning management systems, and the ability to help their children progress through the online curriculum successfully. Many of these issues existed prior to the beginning of the pandemic and they were illuminated because of the pandemic given that this health crisis necessitated that all schools move to online learning modalities.

The research questions explored in this study ask:

1. What are the lived experiences of Black mothers in navigating their children's technology use while serving as parent, employee, and online teacher/helper for their children during the first year of the COVID-19 pandemic?
2. What inequities in the roles of the studied Black mothers are illuminated due to their parental experiences while navigating their children's technology use during the move to online learning modalities during the first year of the COVID-19 pandemic.

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An overview of the literature that informs and supports the justification for this study follows below.

Literature Review

In 2020, the COVID-19 pandemic took the world by storm and impacted all aspects of the lives of citizens around the globe. As communities shut down and global populations isolated themselves, in response to the pandemic, schools quickly shifted to online teaching and learning modalities, directing students to learn at home. Educational organizations were found scrambling for the massive move to virtual teaching and learning venues and many educators worked overtime to develop systems to continue pedagogical practices (Iivari et al., 2020).

Based on these shifts, parents were expected to take over supervision, teaching, and coaching roles and they encountered major disruptions in their adult lives as well as in the lives of their children (Lee et al., 2021). In addition to experiences of changes in their professional, social, and personal lives, parents found themselves stretched between simultaneous responsibilities at work, at home, and in new roles as online teachers and coaches. These conditions not only created stress and anxiety (Patrick et al., 2020), but also intensified many already existing socio-economic inequities such as insufficient childcare, and limited financial resources (Glass, 2020), unemployment, food insecurity, and inadequate housing conditions for many families (Patrick et al., 2020). Further, the circumstances and inequities related to the use of technology and online learning for children and their families added additional layers of stress to already fragile family situations.

Reports and examples of parental anxiety due to the rapid move to online instruction by their children's schools are apparent in a recent Pew Research Center survey conducted in October 2020 that used the Center's American Trends data. A total of 10,332 U.S. adults were surveyed and from this research it was found that parents worried that their children were falling behind because of online instruction (Horowitz & Igielnik, 2020). Further, low-income parents (72%) were more likely than upper class parents (58%) to report that another adult other than them provided additional academic support beyond the school (Vogels et al., 2020, para. 5). In this same survey, upper-income parents (19%) were the most likely to have hired someone to provide additional instruction or resources compared to 8% of lower-income parents (Pew, para. 5).

The survey also found some differences by income. For example, parents of K-12 students with lower incomes (72%) were more likely than middle-income (63%) and upper-income parents (55%) to say they are very or somewhat concerned about their children falling behind in school as a result of disruptions caused by the pandemic (Vogels et al., 2020). Further, the struggle to balance parent employment demands and learner needs was the single-most commonly reported challenge.

Additionally, perspectives on conditions related to this topic were explored by Aguilar et al. (2020) and they found that low-income parents lacked the human

capital to fully support their children with virtual learning. Aguilar et al. (2020) also reported that children from these families were more disadvantaged in these areas of support compared to their middle-class peers.

Similar observations were made by Garbe et al. (2020) who suggest that many low-income parents lacked the preparation to navigate virtual learning experiences for their children. Further, Garbe et al. note that the most prominent issue that parents grapple with is achieving balance between teaching and guiding their children and their employment related responsibilities. These researchers also suggest that parents or others had no choice but to wear new hats as teachers, technology instructors, content experts, and educational guides. As evidenced from other research this abrupt shift exposed many of the existing inequities that existed between students and families who were from varied SES levels (Hall et al., 2020), and brought the "hardships and issues of increased parental involvement to the surface while engaging and trying to assist their children in various levels and types of distance learning" (p. 45).

Consistent with reports of the challenges due to the shift to online learning and the varied discrepancies and inequities for students and families from different SES levels is data shared by the Institute for Children, Poverty, and Homelessness (2020). The Institute estimates that 14.5 million homes lacked internet access or computers at the start of the pandemic. Further, some authors report that parents, especially those who are under-resourced or marginalized, were unable to manage student learning at home as schools transitioned to virtual learning spaces during COVID-19 (Lee et al., 2021). Additionally, Nuñez et al. (2020) noted that school personnel had limited time to help parents who lacked knowledge about teaching and coaching roles and school staff did not have time to help parents anticipate or troubleshoot issues that they might encounter while helping their children with distance learning. Parents were expected to fulfill the roles of classroom managers or "proxy educators" (Aguilar et al., 2020) and that they had to assume roles involving supervising and monitoring student academic progress and self-regulation to complete academic tasks (Nuñez et al., 2020).

Navigating these online academic functions to support their children proved to be even more challenging for mothers and parents from low socio-economic situations. Research shows that due to their circumstances, these parents have been taxed more than other families during the pandemic (Aguilar et al., 2020). It has also been suggested that parents of low socio-economic status may have been juggling numerous adverse situations that have been exacerbated during the COVID-19 period. These situations include economic hardships that cause families to continually exist either near or under the poverty level. Consequently, these parents are often unable to finance additional technological and academic support for their children that might give them a leg up academically. Additionally, there are many families who are living in disadvantaged communities and who are often in "physical spaces, neighborhoods, and schools [that] are increasingly segregated by income and race" (Odgers & Adler, 2018). In addition to housing hardships, families in this SES category do not have adequate health care. These health care conditions do not bode

well during a time when parents and children are facing undue stress and mental health challenges because of the pandemic (Aguilar et al., 2020).

A study by Davis et al. (2020) also examined issues of parents and the resulting stress, mental health, and wellness challenges associated with this pandemic period. Davis et al. explored the parent's new roles and suggested that parents in helping to guide their children through the curriculum and learning activities online served as mock teachers by default. The research of these authors also discussed stress, mental health, and wellness challenges experienced by teachers. Davis et al. noted that there is a relationship between teacher burnout (mental health) and student academic accomplishments. Teachers who were experiencing burnout were shown to be less effective than those who were not, and the authors note that this in turn impacts student learning. One might conclude that parents too who have been forced into the role of teacher are likely to experience burnout as well. Again, the situation is graver for low SES families.

Since the pandemic, parents have been expected to retain teaching knowledge, teach individualized content, assess the emotional needs of children, and maintain their current employment and family responsibilities. Consistent with Davis et al. (2020) the research of Chambers Mack et al. (2019) found that burnt out teachers are not only less effective, but they are more likely to leave the profession. Parents as pseudo educators did not have the option to quit or resign from assisting their children during the pandemic. The study suggests that parents as pseudo educators without adequate training may have a greater adverse impact on their children's academic success.

In the Davis et al. (2020) study, researchers collected and analyzed data from the National Panel Study of Coronavirus Pandemic (NPSC-19), a nationally representative survey of 3338 households in March and April during the pandemic. This quantitative study findings revealed that parents with children who struggled in distance learning experienced elevated symptoms of mental health. The findings were independent of educational and demographic characteristics. Parents that reported their children were struggling with online learning reported symptoms of anxiety and depression. This quantitative study shows a detrimental relationship between a child's difficulty with online learning and parents' mental health distress.

In addition, Davis et al. (2020) found that parents and students require more assistance beyond teaching materials. Most parents accepted the responsibilities of proxy educators without any training. However, an increase of schools checking in with parents to discuss how children are coping with distance learning is appropriate to determine if supplemental learning resources are needed.

Methods

This research is a part of a larger more expansive study of the experiences of parents during the COVID-19 pandemic. The research design for this study involved a qualitative case study. This research sought to gain an understanding about the lived

experiences of Black mothers during the COVID-19 pandemic as they fulfilled the roles of parents, workers and teachers while negotiating their children's technology use during the pandemic.

Participants

The researchers identified and recruited Black mothers between the ages of 18–65 years of age with at least one child whose school moved from face-to-face to virtual learning during the COVID-19 pandemic. The participants who were selected for this study were Black mothers who worked in a service dominated industry and who grappled to navigate their work and childcare situations simultaneously. Research regarding COVID-19 suggests that Black mothers have been shown to carry the greatest load of the childcare for their families during the pandemic (Glass, 2020; Washington, 2021). Mini profiles of the mothers who were interviewed can be found in Table 1.

The researchers initially used criterion based, purposeful sampling approaches to understand "in depth" the phenomena or experiences of the studied parents (Patton, 2002). The researchers sought participants from their networks in community organizations and augmented this recruitment approach using snowball sample techniques by asking research participants to recommend additional individuals to be interviewed for the study. Table 1 provides further details regarding the characteristics of the mothers in this study.

Interviews

This case study explored the lived experiences of the mothers using semi-structured and open-ended interviews. The mothers that were interviewed all experienced changes when their children's schools transitioned all teaching and learning activities from face-to-face to virtual learning modalities during the pandemic. Interviews lasted approximately 30–45 min and were conducted via Zoom.

Approval to conduct the research was secured from the Institutional Review Board for the university where the researchers are affiliated. The interviews were conducted via zoom and included questions asking and open-ended questions

Table 1 Individuals interviewed for the study

Mother	Number of children	Number of school aged children	Employment status
Catherine	Two	Two Elementary and Middle School	Aide in a nursing home
Elizabeth	Four	One (Elementary School)	Aide in a nursing home
Vanessa	Three children	One (High School)	Childcare provider

regarding the lived experiences of the parents as they supported and taught their children at home during COVID-19 school closures.

Following from Creswell (2014) our research considered "the philosophical worldview assumptions that [the participants can bring] to the study" [and our study sought] "to explore the research design related to this worldview" (p. 5). The interviews with the mothers were intended to understand their perspectives and the researchers endeavored to "listen carefully" to what these mothers shared and did as they guided their children in the online learning experiences in their "life settings" (p. 8).

Coding and Analysis

Consistent with qualitative research methods, transcription of the interview data is intended to capture the nuances and to facilitate familiarity with the data. The interview data was transcribed and manually coded by both researchers. Content analysis methods that involve organizing data into thematic categories served to were used by the researchers to identify emergent patterns and to reduce and to make sense of the data (Anderson, 2007). Key patterns in the interview transcripts were identified in the words and phrases from parent accounts of their children's virtual school learning during the pandemic (Patton, 2002). Transcripts were read word for word to identify themes and quotes (Huberman & Miles, 2019). In addition, the researchers scanned the transcripts for mother's perspectives alluding to ongoing inequities that the literature suggests are common to the lived experiences of Black mothers. Common patterns were identified in the words and phrases to make sense of the interview transcripts (Patton, 2002) and key quotes were highlighted and extracted.

Findings

There are several key findings regarding the experiences of Black mothers juggling roles as parents, workers, and online teachers/helpers for their children during the COVID-19 pandemic using the lens of the three mothers highlighted in this manuscript. Mothers shared feelings of frustration about roles as pseudo teachers without training or preparation for these responsibilities, concerns about student self-regulation and attention when learning remotely, concerns about student technology use and controls, anxiety regarding student learning loss, and inadequate school and technology supports.

These less-than-ideal learning experiences added to the extra burden that many low SES families are already grappling with, including adverse living conditions, under-resourced households, and parents who often are working multiple jobs to

earn a living. Parents found themselves trying to negotiate full time and part time employment and work schedules to accommodate students learning virtually at home. Specific emerging themes can be found below.

Mothers as Pseudo Teachers – Frustration and Helplessness

Mothers noted that juggling work and assisting their child with virtual schoolwork was extremely "rough and difficult" (Catherine). There was a great sense of helplessness. The mothers were frustrated because they felt they were being asked to be teachers and instructors without training (All mothers). One mother with four children (one special needs and one school aged child) noted that her full-time employment was jeopardized when the schools shifted to online learning and her seven-year-old child was at home learning virtually all day. "I had to drop/quit my job and look for part-time, and then near the end of year I had to quit completely to help her and get her ready" (Elizabeth). Another mother noted that she was concerned about the math assignments that she had to help her child navigate (Vanessa). Both mothers and children seemed to experience challenging adjustments as shared by Elizabeth who noted, "It was frustrating at first, because I didn't know what some of the subjects were; so she [her daughter] was kinda behind because I was having a little bit difficulty trying to adjust with the child and the child was also frustrated" (Elizabeth).

Concerns About Student Self-Regulation and Attention

Mothers also noted the inordinate amount of time they spent helping their children with schoolwork and shared that they would have to spend multiple hours after work sitting with their children on the computer trying to help their child with schoolwork. Mothers also mentioned challenges with keeping their children's attention and with helping their children self-regulate. One mother noted that she would come home and work until late struggling to keep their child focused (Catherine). Mothers talked about children being "fidgety" and having "short attention spans."

Concerns About Technology Use and Loss of Control

Other common themes expressed by various mothers centered around their concerns regarding losing control of what their children were doing. The mothers worried about how their children were managing when they were not present (Catherine and Vanessa). One mother noted repeatedly that "It was really, really tough. I did not know what my child was doing" (Catherine). Many mothers were worried that when they were at work, they did not have control about their child's online use while they

were away. Another mother who had one high-school child had concerns about monitoring her child's internet usage. She "wondered was she doing what she was supposed to do" (Vanessa). This was also reflected in the literature.

Anxiety Regarding Student Learning Loss

Mothers seemed to have a major sense of great worry regarding their children and learning loss. "I was really concerned about whether she could keep up with the pace of her class" (Elizabeth). The mothers all expressed anxiety about their children's academic progress. The mother with a high schooler noted "It was just an experience that wasn't the most pleasant" and she was very concerned that her child "would fall behind in her courses" (Vanessa). This theme is echoed in an Education Trust (2020) report.

Inadequate School and Technology Supports

Some schools provided computers, typically Chromebooks or iPads and some sent textbooks, papers, assignment sheets, and even examinations to the child's home for students to complete with the assistance of their parents. Some of the daily work was done on computer programs and accessed through various school portals. Some schools were using Google Classroom and others used Zoom or Skype for virtual learning. It appeared that the platforms for learning often differed from school to school and Elizabeth whose child switched schools mid-year encountered major confusion because her child was using Skype at one school and then Zoom at the other.

The book work, paperwork, and examinations were often in the form of additional assignments that needed to be completed and monitored. Like numerous parents during the pandemic, mothers voiced their concerns about having limited knowledge of subjects and having to spend large compliments of time guiding their children who often had asynchronous lessons or limited instruction and interaction with the teacher. Some mothers talked about the challenge with waiting and response times from teachers when students needed teacher guidance.

Implications for Further Research

There are varied areas for further research and recommendations for different stakeholders resulting from this study. Implications for educational organizations suggest that further research is needed to consider the expansion and design of school-based support services and help desk functions to facilitate at home learning educational organizations with both face-to-face or virtual modalities suggest. Additionally, extra reinforcements are necessary to help bolster student learning, especially those

from under-resourced circumstances. These resources would not only be helpful during the school day but would be particularly useful after hours and on weekends.

Additionally, parental training and exposure to school technology platforms prior to children beginning online classwork would be invaluable in helping families as they assist their children in navigating the online terrain. Further, support would be advantageous to facilitate the sharing of resources and responsibilities for mothers from underrepresented or marginalized groups. These habits of collaboration would also be valuable for all families who lack the social capital and supportive networks for their children.

Conclusion

Overall, this research shows that parents struggled with a myriad of challenges that were further exacerbated during COVID-19 for students and their families from marginalized communities. This study suggests that greater mindfulness and a more intensive focus from educators is needed to address ongoing inequities in online learning for students' diverse backgrounds. An examination of the varied challenges as it relates to online educational experiences is essential to help provide more equitable learning experiences for all students.

References

Aguilar, S. J., Galperin, H., Baek, C., & Gonzalez, E. (2020, October 14). *When school comes home: How low-income families are adapting to distance learning*. https://doi.org/10.35542/osf.io/su8wk

Anderson, R. (2007). *Thematic content analysis*. Description presentation of qualitative data available: http://www.wellknowingconsulting.org/publications/pdfs/ThematicContentAnalysis.pdf

Chambers Mack, J., Johnson, A., Jones-Rincon, A., Tsatenawa, V., & Howard, K. (2019). Why do teachers leave? A comprehensive occupational health study evaluating intent-to-quit in public school teachers. *Journal of Applied Biobehavioral Research, 24*(1), e12160.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. Sage.

Davis, C. R., Grooms, J., Ortega, A., Rubalcaba, J. A. A., & Vargas, E. (2020). Distance learning and parental mental health during COVID-19. *Educational Researcher, 50*, 61. 0013189X20978806.

Garbe, A., Ogurlu, U., Logan, N., & Cook, P. (2020). Parents' experiences with remote education during COVID-19 school closures. *American Journal of Qualitative Research, 4*(3), 45–65.

Glass, K. (2020, June). Black families were hit hard by the pandemic. The effects on children may be lasting. *The New York Times*.

Hall, J., Roman, C., Jovel-Arias, C., & Young, C. (2020). Pre-service teachers examine digital equity amidst schools' COVID-19 responses. *Journal of Technology and Teacher Education, 28*(2), 435–442. Waynesville, NC USA: Society for Information Technology & Teacher Education. Retrieved April 15, 2021 from https://www.learntechlib.org/primary/p/216180/

Horowitz, J., & Igielnik, R. (2020). *Most parents of K-12 students learning online worry about them falling behind: Parents of children attending school in person are largely satisfied with steps to prevent coronavirus spread but still concerned about exposure*. Pew Research Center.

Huberman, A. M., & Miles, J. S. M. B. (2019). *Qualitative data analysis: A methods sourcebook* (4th ed.). Sage.

Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital transformation of everyday life: How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management, 55*, 102183.

Institute for Children, Poverty, & Homelessness. (2020, March). *10 things to know about homeless students amid the COVID-19 crisis.* Retrieved from https://www.icphusa.org/commentary/10-things-to-know-about-homeless-students-amid-the-COVID-19-crisis/

Lee, S. J., Ward, K. P., Chang, O. D., & Downing, K. M. (2021). Parenting activities and the transition to home-based education during the COVID-19 pandemic. *Children and Youth Services Review, 122*, 105585.

Nuñez, B., Stuart-Cassel, V., & Temkin, D. (2020, March). *As COVID-19 spreads, most states have laws that address how schools should respond to pandemics.* Child Trends. https://www.childtrends.org/blog/as-covid-19-spreads-most-states-have-laws-that-address-how-schools-should-respond-to-pandemics

Odgers, C. L., & Adler, N. E. (2018). Challenges for low-income children in an era of increasing income inequality. *Child Development Perspectives, 12*(2), 128–133.

Patrick, S. W., Henkhaus, L. E., Zickafoose, J. S., Lovell, K., Halvorson, A., Loch, S., et al. (2020). Well-being of parents and children during the COVID-19 pandemic: A national survey. *Pediatrics, 146*(4), e2020016824.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage.

Vogels, E., Perrin, A., Rainie, L., & Anderson, M. (2020). *53% of Americans say the internet has been essential during the COVID-19 outbreak: Americans with lower incomes are particularly likely to have concerns related to the digital divide and the digital "Homework Gap"*. Pew Research Center.

Washington, J. (2021, August). One paycheck away from losing everything': Why the child care crisis is especially hard for black mothers. *The Fuller Project*.

Human Capital, Rights, and Capabilities: Equitable Learning Design Based on Justice

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As learning designers, we are interested in improving how learning happens. In this chapter, we will focus on three aspects related to learning: the people who are involved in learning, the activities related to learning, and, finally, the outcomes related to learning. Learning design is the organization of learning resources, tasks, or supports that result in learning opportunities, and learning outcomes for students over time (Lockyer et al., 2013). Many of the tools and theories that we use are based on theories of human capital, where knowledge and or expertise are viewed as resources, and improvements are in terms of that utilization or productivity (Robeyns, 2017). The predominant questions addressed in learning design revolve around how resources are utilized for improving knowledge levels, expertise, or overall productivity of institutions or communities. The design challenge is often about making learning better, or how we optimize learning. However, learning design is more effective when our goals are not just knowledge-centered, but also student-centered, community-centered, and assessment-centered (Bransford et al., 2000). Student-centered goals strive to ensure that all students can achieve their highest possible potential. Community-centered goals encourage participation and a sense of belonging so that both students and communities foster meaningful relationships and overall well-being (Lave & Wenger, 1991). Assessment-centered goals focus on evidence of learning and monitor how learning happens over time so that we can improve learning further. To a fair extent, human capital-based theories

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address many of the above goals. However, human capital tends to focus on overall gains or optimization, and issues of equity—distribution of benefits and gains (or deficits)— may not be explicitly addressed.

As researchers interested in issues of equity in learning, we are aware of the power and privileges of learning designers when we engage in learning design and research. Learning design involves the strategic use of learning tasks, tools, or other resources to improve how students learn over time (Lockyer et al., 2013). In other words, as learning designers, we are in a position to decide how learning resources are utilized by students, teachers, or others: how people use resources for better learning opportunities or learning outcomes. Here, learning opportunities are evidence of how students, teachers, or others access learning resources (for example, schools, teachers, books, technology, experts in a certain subject, etc.), while learning outcomes are evidence of learning processes or fulfillment of learning goals (knowledge in a certain subject, level of expertise, ability to perform, test procedures, etc.). Initially, when we are analyzing learning design problems or looking for design alternatives as solutions, we often rely on human capital-based theories that focus on knowledge and expertise as we are looking for overall gains. However, once we identify possible design alternatives that work and start evaluating them for different individuals in different contexts, we often need further guidance on further making additional improvements or iterations. For example, when we try to design student-centered solutions, many students show learning gains and overall results show improvements, but we also observe some students not showing similar gains or, being demotivated. The evidence is often in the form of feedback from students, teachers, or other stakeholders. In such cases, we often fall back on a human right-based approach, where we acknowledge that every individual has the right to education—to learning opportunities and learning outcomes. The Universal Declaration of Human Rights (UN General Assembly, 1948) was a landmark event for human rights when primary education was identified as a basic human right. Today, other movements including the Sustainable Development Goals (UNESCO, 2017; United Nations, 2015) strive for tertiary education as a human right. The human rights approach builds on such approaches and tries to ensure that every student or individual has an equal opportunity to education or learning resources. However, researchers and critics point out that human rights-based approaches lack accountability or a practical implementation framework though they provide a foundation based on constitutional rights and laws (Wang, 2012; Robeyns, 2017).

Our interpretation of the basic human rights is to ensure that every individual, or student, shows improvement due to any learning design efforts. Most learning design efforts lead to overall student improvements but, inevitably, some students underperform or fare worse than before. Philosophically, we strive for the notion of equity, but we acknowledge that equity may be a utopian notion and what we may achieve is less unfairness, not more equity. However, less unfairness is an outcome that we continuously strive for and we look for opportunities for identifying and alleviating it. So, we come back to the question of how resources are distributed and utilized for learning. Compared to earlier centuries, today we have enough resources to meet the basic needs of most people. However, we still witness

deprivation and lack of access to education (Robeyns, 2017). As schools shut down during the pandemic, school lunch programs impacted about half a billion children worldwide. Beyond serving as essential food distribution centers, schools are often pivotal community centers in many communities worldwide (Earl & Lalli, 2020). Schools are not just places of learning but they also provide livelihood and account for the well-being of children world-wide. The learning opportunities and learning outcomes are not just related to knowledge or expertise but also how learning benefits people in their communities, their health, and their well-being. We can argue that human capital-based theories measure or assess learning in ways that indirectly assess the well-being of individuals or communities.

Rawlsian notions of justice may be applied to how such resources are distributed in an equitable manner. According to Rawls (2017), in cases of inequality, everyone must have the same access to resources or opportunities, or resources should be distributed so that they benefit people with the least advantage. Here, human capital-based theories complement Rawlsian notions of justice as we can model input and output mechanisms and measure the distribution of resources. The classic example is of dividing and distrituting a cake. In most cases, we make equal pieces of the cake and distribute them. If we don't have enough, we might give larger pieces to those who need them most (or, conversely, we can be selfish and take the larger piece). Sen (2009) argues that, even in such cases, we are focusing on commodity as a outcome, but not well-being. For example, a larger person may need a bigger piece than a small child. Considerations may be different based on nutrition, health, or other well-being considerations. If we consider the examples of fasting and starvation, a person that is fasting is voluntarily not consuming any food because of religious beliefs (or other reasons), while in starvation a person is not consuming food because they do not have any food. In the former, the person has access to resources and has a choice while in the latter the person has no access to resources and no choice. In the capability approach, Sen argues that though the observed outcomes and distribution are similar, we should acknowledge the difference in freedom because of the difference in access to resources, the availability of opportunities, and the agency to choose. We further use the capability approach to explore how learning design results in different learning opportunities or learning outcomes, and how inequities can be further addressed.

As learning designers, learning scientists, or learning researchers, we can design learning opportunities by designing how students or teachers (or others) access and use learning tasks, resources, or tools. We may contend that learning design is about the strategic use of learning environments for better learning opportunities and learning outcomes. However, designing for access, use, or learning opportunities is not sufficient for successful learning outcomes (Gillborn & Youdell, 2000; Vossoughi, 2017). Further questions arise when we try to illustrate how learning opportunities and learning outcomes differ for different students, or for whom. We design to support students but students often do not have the metacognitive skills to strategically use learning resources based on learning goals, so teachers often need to make learning design decisions for students (Nickerson, 1993). So, if teachers carry out learning design activities, what is the role of learning designers or learning

scientists? Who decides what is a successful learning outcome? If learning is student-centered, what is the role of the students in a learning community and in deciding learning outcomes? If learning varies by individual or contexts, what do we mean by equality, or equitable learning? We do not have answers to these questions and the answers often differ by context, groups, or settings. However, we hope that using contrasting and complementing theories simultaneously helps us in being critical of our equitable learning design efforts. Before we proceed, we elaborate on the notion of equitable learning and how it relates to our learning design efforts. Afterwards, we briefly explain the constructs of human capital, human rights, and human capabilities. Lastly, we will explore a few examples that may help to situate how the different theories may be used.

Equitable Learning

We explore equitable learning in learning environments based on learning opportunities and learning outcomes (Gillborn & Youdell, 2000; Shah & Lewis, 2019). As discussed earlier, learning opportunities are evidence of whether students or teachers have access to learning resources (including activities or interactions), while learning outcomes are either evidence of learning processes or fulfillment of learning goals. In any setting of teachers and students, teachers and students have different backgrounds and prior knowledge that affect learning differently. For example, students will differ in how they learn, and the learning outcomes will also differ (though we can classify similar outcomes together). The learning will also vary based on the teacher. Also, the same student may learn differently if teachers are different, if they are in a different classroom, school, or even if they are learning at different times.

Before we consider learning opportunities and learning outcomes, it is useful to consider background and prior knowledge. Students or teachers of all backgrounds, abilities, or prior knowledge should be able to access learning tasks, resources, or tools within learning environments (National Academies of Sciences, Engineering, & Medicine, 2018). For example, a learning task may be designed so that students perform the task and progress towards an intended learning goal. However, different students may vary in terms of the effort or time required to complete the learning task. Ideally, while designing the learning task, a learning designer gives adequate consideration to the backgrounds and prior knowledge of different individuals so every individual has a similarly uniform access. If individuals are grouped or observed based on any criteria, the criteria should be evaluated and made explicit. Evidence can be presented based on the availability of learning resources, rules, provisions for different individuals, and evidence of how individuals access (or use) learning resources.

Second, we evaluate how different learners avail the learning environment – learning opportunities. Learning opportunities relate to individual interactions and social interactions within a learning environment. Individual interactions are how

individual students or teachers interact with the learning environment: how people interact with learning tasks, resources, or tools. Social interactions are how teachers and students interact with each other and amongst themselves in groups. In many instances, social interactions are crucial for learning. For example, communicating, sharing, and expressing are learning tasks that can promote more effective learning. For equitable learning, learning design must plan for individual interactions or social interactions that are uniformly available to individuals of different backgrounds or prior knowledge. A simple way of representing learning opportunities is to outline steps, activities, rules, or goals for different individuals.

Lastly, equitable learning should present evidence of learning outcomes, evidence of learners engaging in learning activities or successfully achieving learning goals. Designed learning opportunities may not always result in intended learning outcomes. Moreover, learning opportunities result in varying levels of participation or achievements. Learning may require participation in learning tasks, but the nature of participation may vary based on how the task is designed or the ability of students to participate. For example, participation in discussions may vary based on how a discussion is framed, how group dynamics vary, or simply based on the knowledge or interest levels of participants. So, learning design must consider how background and prior knowledge affect participation and ensure that adequate supports are available for everyone. A common observation is that discussions seem to have fewer participation without any intervention. Apart from participation, learning achievement may also vary for different students. For example, in reading or math, students may not meet the same achievement levels, though all of them may exhibit adequate learning. Some may be more proficient than others. However, equitable learning design should ensure that varying learning outcomes are not solely dependent on the backgrounds or prior knowledge of students, teachers, or other members of the learning community.

Overall, we can summarize that equitable learning design is the strategic use of a learning environment that leads to better learning opportunities and learning outcomes for all learners, regardless of their backgrounds or prior knowledge. An argument can be made that it is neither possible nor feasible to design for equitable learning. How do we evaluate learning design for equitable learning? Evidence in this area seems to suggest that, though equitable learning outcomes are not universal, there are many examples worldwide. Below, we discuss three types of sociological constructs to evaluate learning design (and educational policies): human capital, rights, and capabilities (Robeyns, 2020; Unterhalter, 2007).

Human Capital

Human capital-based theories and approaches try to explain education in terms of knowledge and productivity. In human capital, knowledge and expertise are resources that can be optimized to improve productivity (Goode, 1959; Weisbrod, 1962). In this sense, learning resources are viewed as commodities to utilize or as

capital to invest. Human capital-based theories have a long history and such theories also encourage individual and social reflection of pedagogical practices that promote opportunities for support based on trust or expectations (Fishman & Davis, 2014). Many learning design efforts use theories of human capital to optimize learning – to create better learning enviroments. Using such theories, learning can be modeled as input and output mechanisms where the distribution and utilization of learning resources can be explored. However, though such models improve the knowledge and productivity of society at large, the focus on optimization may not address issues of distribution, gender, ability, emotions, culture, etc. For example, in many states around the world, almost eighty percent of the students go to urban or sub-urban schools (Geverdt, 2015), so huge improvements in school graduation rates can be achieved by focusing on only urban schools (at the expense of rural schools). Alternatively, graduation rates can be improved through selective admissions processes that favor certain students over others. Human capital-based theories or approaches may not necessarily object to the examples given here as the overall trends indicate improvement or gains. It is worth noting, though, that student-centered and community-centered learning environments may also be attributed to human-capital based theories. The major criticism of human capital is that human capital focuses on optimization and resources that may not directly account for human development or well-being (Wang, 2012). Moreover, human capital tends to underplay the role of social relations or non-economic outcomes or values related to learning.

Human Rights

In comparison with human capital, human rights-based approaches assume education as a basic right of individuals and recognizes the critical role of education in an individual's life and future opportunities. Most countries have declared education a fundamental right for all after the Universal Declaration of Human Rights (UDHR; UN General Assembly, 1948) urged countries for the right to primary education for all. While human capital-based models focus on optimization, human rights-based models focus on justice as rights considerations. In most countries, human rights are executed through legal frameworks that limit accountability to governments. Education is mostly under the purview of governments, so making governments accountable may seem like a good idea, but results vary. For example, in India, education is a constitutional right but literacy rates remain low. By contrast, education is not a constitutional right in the United States, but the country enjoys almost universal literacy. Many of the criticisms for human-capital based approaches are relevant to human rights-based approaches as well. For example, though the UDHR was a proclamation of human rights for all, separate conventions were declared and ratified to further emphasize the rights of women, children, and people with disabilities—a declaration of human rights is often not enough if individuals do not have resources or if others don't help. Nevertheless, the

constitutional and legal frameworks of human rights provide a strong foundation for most approaches or constructs related to human development and education, including how people learn. Many critics and researchers (Nussbaum, 2011; Robeyns, 2017; Sen, 2005) acknowledge that human rights-based approaches and frameworks must be supplemented for actual opportunities and outcomes.

Human Capability Approach

If others in society are in a position to help learners in need, how do we consider moral or justice-based considerations to help with well-being or learning? The capability approach (Sen, 2009) extends human capital and human rights considerations to issues of justice through concepts of capabilities and functionings. Capabilities are various possibilities that an individual can avail of, while functionings are the various achievements that an individual attains in terms of education, getting a job, or availing a resource; capabilities are opportunities while functionings are outcomes. For example, a learning-related capability may be the opportunity to avail a tablet to play a learning game, while the functioning is the actual use and ability of a student to play the game and learn. Capability approach asks us to consider how individuals with different abilities may use a tablet successfully to learn. In the above example, if the learning game is in English, a student may have the capability to use the learning game but may be unable to actually play if they do not know the related rules, or if they are too young to understand the instructions provided at an advanced language level, or if they do not know English. Moreover, capabilities do not always transform into functionings. For example, in most countries, more women graduate from universities at all levels but, in the workplace, women have fewer jobs with less pay. In this case, though women have equal opportunities or capability at the school levels, women do not have the same functionings as men in the workplace. Agency, or the ability to choose goals based on an individual's preference, is also another critical factor in how we select capabilities or functionings.

In contrast to human capital approaches that focus on knowledge and productivity, the capability approach also asks us to directly consider opportunities that learning environments may provide over time (Wang, 2012): lifelong learning opportunities related to better education, better jobs, better health, better living, etc. Compared to human rights approaches, the capabilities approach also focuses on actual outcomes. However, the capability approach is relatively new and offers few examples of equitable learning. Hence, all three approaches—human capital, human rights, and human capabilities—may be explored in equitable learning design exercises that account for different backgrounds or prior knowledge.

Examining Equitable Learning

In many studies of equitable learning, Economic, Social, and Cultural Status (ESCS) characteristics are used to identify learning opportunities, variations in learning outcomes, or students at risk. ESCS characteristics often explain many inequities, so the American Psychological Association (APA, 2007) suggests three methods for analyzing ESCS data.

The first method suggests analyzing "materialistic" characteristics, such as income or wealth. Disadvantages or risks may be analyzed using cut-offs such as poverty line, free school meal status, etc. Human capital can analyze such cases and most design processes have methods to deal with such empirical data. A large portion of the inequities in learning may be accounted for by socio-economic indicators (Demie, 2019; Sammons, 1999; Strand, 2014). Learning designers or researchers may use data to prioritize certain individuals or groups using simple weights, Pugh charts, or collate data to form profiles or personas. However, assigning different weights to different groups is equivalent to prioritizing some individuals over others, which raises issues of equity (Alkire, 2011; Bourguignon & Chakravarty, 2019). Human rights approaches may shift the focus from groups to individuals and help identify students at risk. Capability approach may highlight how capabilities such as the location of the school may affect learning outcomes. For example, urban schools tend to outperform rural schools but, in some countries like the United States, the reverse may be true. Capability approach will also encourage us to explore learning outcomes more broadly.

The second method proposes a "gradient" approach by ranking individuals within a society and comparing different societies on a relative basis. Multiple dimensions may be used to create an index and rank individuals, while comparisons between groups or communities are done on a relative basis. For example, teacher quality is often a major factor for improved learning outcomes. Schools that struggle to recruit or retain teachers often exhibit comparatively less learning outcomes. In such cases, the gradient approach makes it easy to make comparisons within a group, but comparison across groups may be more difficult. For example, when education is analyzed as rights, the gradient-based approach can conclude that students in rich countries are more resilient though resilience is defined as a characteristic of students with disadvantaged ESCS characteristics (Agasisti et al., 2021). Researchers use the "gradient" approach for equity frameworks as indices can be reported easily to stakeholders, and group comparison analyses are simpler using relative measures. Recent research suggests using equal weights for ESCS dimensions as there are few differences in findings or trends of student achievement data when compared to ESCS composite indices using arbitrary weights (Avvisati, 2020). In such cases, while it may be easier to model using gradient approaches, interpretation will be easier using simple grouping techniques that allow researchers to make meaningful comparisons for practice.

The third method focuses on categorical measures of power or privilege, such as social class, hierarchical titles, etc. in classrooms or other learning environments

(Kumar et al., 2019; Sims, 2017). If learning environments are student-centered, higher categorical measures should be associated with students but often evidence points to the contrary, where students are often not prioritized. Categorical measures may also explore different pathways when learners engage with their learning communities, both within learning communities and as part of the broader communities. Human capital theories usually don't directly measure such relations though learning designers and researchers can choose to do so. Human rights also tends to be agnostic on such issues and highlights them indirectly. The capability approach will encourage us to explore such issues of freedom and agency, both for individuals and institutions. Student aspirations are often a good indicator for better student outcomes (Schleicher, 2019). For example, Keung and Ho (2020) examine how parental expectations and student's individual agency affect student aspirations in adolescents. Depending on the learning goals and outcomes, the rights of an individual to learn can be balanced with how learning design optimizes the use of learning resources.

Conclusion

We do not understand educational inequalities well and we do not have a good theory that can be used for equitable learning outcomes (Ladwig, 2010). One of the major challenges of equity is that we know equity as a notion, but the construct is largely philosophical. We have few instances of equity, though, increasingly, the world is showing progress with more examples of equitable learning in schools and other learning environments (Schleicher, 2019). There are benefits of using multiple methods for data representation, analysis, and design because individual theories do not always explain inherent inequities, while ramifications for practice and policy vary vastly based on individuals, contexts or settings. In particular, multiple approaches may result in a better understanding of how learning opportunities or outcomes may differ from the intended goals of learning designers. Perhaps, it may be critical that backgrounds and characteristics of learning designers and researchers are also considered, both as collaborators and as instigators.

References

Agasisti, T., Avvisati, F., Borgonovi, F., & Longobardi, S. (2021). What school factors are associated with the success of socio-economically disadvantaged students? An empirical investigation using PISA data. *Social Indicators Research, 157*, 7491–33781. https://doi.org/10.1007/s11205-021-02668-w

Alkire, S. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics, 95*(7–8), 476–487. https://doi.org/10.1016/j.jpubeco.2010.11.006

APA. (2007). *Report of the APA task force on socioeconomic status*. http://www.apa.org/pi

Avvisati, F. (2020). The measure of socio-economic status in PISA: a review and some suggested improvements. In *Large-Scale Assessments in Education* (Vol. 8, Issue 1, p. 8). Springer. https://doi.org/10.1186/s40536-020-00086-x

Bourguignon, F., & Chakravarty, S. R. (2019). The measurement of multidimensional poverty. In *Poverty, Social Exclusion and Stochastic Dominance* (pp. 83–107). Springer Singapore. https://doi.org/10.1007/978-981-13-3432-0_7

Bransford, J. D., Brown, A. L., Cocking, R. R. W., Donovan, M. S., & Pellegrino, J. W. (2000). *How people learn: Brain, mind, experience, and school*. National Academies Press.

Demie, F. (2019). *Educational inequality: Closing the gap*. UCL Institute of Education Press.

Earl, L., & Lalli, G. S. (2020). Healthy meals, better learners? Debating the focus of school food policy in England. *British Journal of Sociology of Education, 41*(4), 476–489. https://doi.org/10.1080/01425692.2020.1735999

Fishman, B. J., & Davis, E. A. (2014). Teacher learning research and the learning sciences. In *The Cambridge handbook of the learning sciences* (pp. 535–550). Cambridge University Press. https://doi.org/10.1017/cbo9780511816833.033

Geverdt, D. (2015). *Education demographic and geographic estimates program (edge): Locale boundaries user's manual* (NCES 2016-012). National Center for Education. https://eric.ed.gov/?id=ED577162

Gillborn, D., & Youdell, D. (2000). *Rationing education: Policy, practice, reform, and equity*. Open University Press.

Goode, R. B. (1959). Adding to the stock of physical and human capital. *The American Economic Review, 49*(2), 147–155. https://www.jstor.org/stable/1816110

Keung, C. P. C., & Ho, E. S. C. (2020). Structure and agency in adolescents' expectations of pursuing post-secondary education. *Research in Higher Education, 61*(2), 270–295. https://doi.org/10.1007/S11162-019-09574-8

Kumar, P. C., Vitak, J., Chetty, M., & Clegg, T. L. (2019). The platformization of the classroom: Teachers as surveillant consumers. *Surveillance and Society*. https://doi.org/10.24908/ss.v17i1/2.12926

Ladwig, J. G. (2010). Beyond academic outcomes. *Review of Research in Education, 34*(1), 113–141. https://doi.org/10.3102/0091732X09353062

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

Lockyer, L., Heathcote, E., & Dawson, S. (2013). Informing pedagogical action: Aligning learning analytics with learning design. *American Behavioral Scientist, 57*(10), 1439–1459. https://doi.org/10.1177/0002764213479367

National Academies of Sciences, Engineering, & Medicine. (2018). *How people learn II: Learners, contexts, and cultures* (p. 10.17226/24783). The National Academies Press.

Nickerson, R. S. (1993). On the distribution of cognitions: Some reflections. In G. Salomon (Ed.), *Distributed cognitions: Psychological and educational considerations* (pp. 229–262). Cambridge University Press.

Nussbaum, M. C. (2011). Capabilities, entitlements, rights: Supplementation and critique. *Journal of Human Development and Capabilities, 12*(1), 23–37. https://doi.org/10.1080/19452829.2011.541731

Rawls, J. (2017). A theory of justice. In *Applied ethics: A multicultural approach* (6th ed.). Harvard University Press. https://doi.org/10.4324/9781315097176

Robeyns, I. (2017). Wellbeing, freedom, and social justice: The capability approach re-examined. In *Wellbeing, freedom and social justice: The capability approach re-examined*. Open Book Publishers. https://doi.org/10.11647/obp.0130

Robeyns, I. (2020). Wellbeing, place, and technology. *Wellbeing, Space, and Society, 1*, 100013. https://doi.org/10.1016/j.wss.2020.100013

Sammons, P. (1999). School effectiveness: Coming of age in the 21st century. *Management in Education, 13*(5), 10–13. https://doi.org/10.1177/089202069901300504

Schleicher, A. (2019). *PISA 2018: Insights and interpretations*. OECD Publishing. https://eric.ed.gov/?id=ED601150

Sen, A. (2005). Human rights and capabilities. *Journal of Human Development, 6*(2), 151–166. https://doi.org/10.1080/14649880500120491

Sen, A. (2009). *The idea of justice*. Belknap Press of Harvard University Press.

Shah, N., & Lewis, C. M. (2019). Amplifying and attenuating inequity in collaborative learning: Toward an analytical framework. *Cognition and Instruction, 37*(4), 423–452. https://doi.org/10.1080/07370008.2019.1631825

Sims, C. (2017). *Disruptive fixation: School reform and the pitfalls of techno-idealism* (Princeton studies in culture and technology series). Princeton University Press. https://search.proquest.com/docview/1895981136?accountid=27428

Strand, S. (2014). School effects and ethnic, gender, and socio-economic gaps in educational achievement at age 11. *Oxford Review of Education, 40*(2), 223–225. https://doi.org/10.1080/03054985.2014.891980

UN General Assembly. (1948). *Universal declaration of human rights | United Nations*. General Assembly Resolution. https://www.un.org/en/universal-declaration-human-rights/

UNESCO. (2017). Global education monitoring report. In *Accountability in education: Meeting our commitments*. UNESCO Publishing. https://doi.org/10.1007/0-387-36424-2_24

United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs*. https://sdgs.un.org/2030agenda

Unterhalter, E. (2007). Gender equality, education, and the capability approach. In M. Walker & E. Unterhalter (Eds.), *Amartya Sen's capability approach and social justice in education* (pp. 87–107). Palgrave Macmillan. https://doi.org/10.1057/9780230604810_5

Vossoughi, S. (2017). Access and equity in out-of-school learning. In K. Peppler (Ed.), *The SAGE encyclopedia of out-of-school learning* (pp. 1–5). Sage. https://doi.org/10.4135/9781483385198

Wang, L. (2012). Social exclusion and education inequality: Towards an integrated analytical framework for the urban-rural divide in China. *British Journal of Sociology of Education, 33*(3), 409–430. https://doi.org/10.1080/01425692.2012.659455

Weisbrod, B. A. (1962). Education and investment in human capital. *Journal of Political Economy, 70*(5, Part 2), 106–123. https://doi.org/10.1086/258728

Reckoning with Racism in Medical Practice: A Scoping Review of Inclusive Learning Design in Medical Training 2017–2021

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> *Inclusion is not a strategy to help people fit into the systems and structures which exist in our societies; It is about transforming those systems and structures to make it better for everyone. Inclusion is about creating a better world for everyone.* Diane Richler, past president, Inclusion International (2021)

Following the race protests in the US after George Floyd's death at the hands of the police in 2020, many are re-examining their roles and the roles of institutions in perpetuating racism, intolerance, exclusion, and the lack of equity for all people. For medical training institutions in the US, many questions continue to be raised about how students are prepared to address social inequity, exclusion, and racism after they graduate and start practicing.

One way to examine how students in medical schools are taught to address equity, social justice, reduction or removal of racial bias, and inclusion is to examine how they are taught to address these issues. Incidences of exclusion and racism have been reported in the recruitment and training of students of color in medical schools. Yousif et al. (2020) note that often medical residency classes do not include black trainees, review-and-promotion committees do not include black faculty, and black physicians and nurses are repeatedly mistaken for custodial or support staff by peers and patients alike.

This scoping review explores the extent to which inclusive learning design is practiced in medical training schools, medical institutions, clinical practices, and the professional development of medical practitioners as recorded in select peer-reviewed articles. The purpose is to investigate why social inequity persists in the medical profession where minoritized individuals have suffered worse medical outcomes compared to non-minorities. According to Bailey and Moon (2020), people in marginalized racial groups are overrepresented in racially and economically

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segregated communities with substandard housing conditions, unsafe or limited water, and crowded housing which make hand hygiene and self-quarantine challenging, leading to an increase in Covid-19 cases.

Historic Racism and Exclusion in Medical Training

In tandem with society at large which is confronting racism and its effects, the medical profession is also taking a hard look at how an inclusive learning design influences the teaching and practice of medicine. The medical profession is pondering underlying racial factors that influence how medical training institutions admit students into medical colleges, the training practices of these institutions, the clinical practices of medics, the conduct of medical research, and the professional development of medical practitioners.

The racial protests in the US in the summer of 2020 brought to the fore, once again, the question of racial disparity. Racial discrimination persists in the medical profession despite modest gains. Inequities against minoritized medical practitioners include limited opportunities for training and practicing medicine. For example, according to Aluko (2008), until the 1950s African American physicians in Mecklenburg Country in North Carolina were denied professional membership to medical professional organizations. Membership to these organizations (including the American Medical Association) was required for physicians to sit board examinations. The denial of membership to these organizations effectively de-credentialed generations of black and non-white physicians from practicing medicine. Other discriminatory practices include the exclusion of minoritized doctors from health panels and plans, denial of hospital staff privileges because of race, discrimination by managed care organizations, including the restrictive selection of service areas and not providing patients with a choice of physicians (Dennis, 2001).

Researchers note that medical discrimination has been recorded as far back as the Tuskegee experiments of 1932 where 600 African American men were left untreated with syphilis (Brandt, 1978) and even earlier during the enslavement of black people in the US. Indeed, the US Human and Health Services (HHS) Secretary Margaret Heckler noted that there were striking differences in the health status of minoritized and the non-minoritized population and although the overall health of Americans had improved, minorities continued to suffer persistent death, disease, and disability, with blacks having a life expectancy five years lower than the white population (United States Department of Health, Human Services, 1985). However, the Covid-19 pandemic seems to have once again brought this issue to the fore forcefully. Statistics released by US state medical authorities have shown that people of color were more affected by the disease than other racial groups (Chowkwanyun & Reed, 2020), mostly because of underlying medical conditions because of years of medical neglect. This neglect continues when medical educators and students only identify race in biological terms and do little to combat racial injustices in health and healthcare resulting from social underpinnings and manifestations of

race in the US (Olsen, 2019). A study by Milem et al. (2004) found medical schools are working to respond to healthcare concerns that have resulted from an increasingly diverse patient population in the US. Thus, medical schools are designing and implementing learning modules that address issues and topics that include cultural competence, which is also required by the Liaison Committee for Medical Education (LCME). A planned and sustained effort is required to address historic discrimination in medical training. One way that the training of medical professionals to recognize and avoid racist actions is by using inclusive learning design in US medical schools. An inclusive learning design will enable medical school faculty to be actively engaged in rooting out racism, exclusionary, inequitable, and discriminative behaviors, and norms. This may foster non-discriminatory or non-racist power structures in their institutions.

The research question for this scoping review is: "To what extent do US medical institutions use inclusive learning design to sensitize medical professionals in addressing social inequity and systemic racism in their practice?"

Methodology

This scoping review considered literature in select peer-reviewed publications to gauge how medical training institutions use inclusive learning design in their teaching processes. The studies reviewed were for the five years between 2017–2021. I reviewed the literature for the recommended learning design measures that can be successfully adopted in medical learning institutions. A scoping review was used in this study because the intention is not to claim an exhaustive examination of the topic, but to arrive at a broad assessment of how medical schools address equity, inclusion, and anti-racism in their curriculum.

The articles were searched in medical databases: *PubMed, Science Direct, Scopus, The Cochrane Library,* and hand-searching using the *Google Scholar* database. I limited the corpus to articles published from 2017 to the present. The search terms used were: "learning design in medical schools," "inclusive design in medical training," and "equity in medical training." I reviewed articles that focused on human medicine, especially research focusing on medical training institutions. My research also concentrated on articles on discrimination targeting exclusionary practices regarding race and minoritized ethnic communities. The term *minoritized* has been deliberately used in this study to indicate that people with marginalized experiences are not disenfranchised due to a lack of representative numbers; rather it is due to the socio-cultural hierarchies and policies that negatively impact them (Navas et al., 2021). The term is intentionally meant to honor the identities of these communities.

The exclusion criteria for articles were as follows: (1) articles not written in English, (2) articles about programs and research outside the United States, (3) articles published outside the focus years 2017–2021, (4) articles describing international experiences outside the US, (5) reflective pieces, book reviews, or

commentaries, and (6) articles that were not accessible to me. The narrow screening was effective in narrowing the scope to identify relevant articles which could lead to answering the research question.

I used the Critical Race Theory as a framework for this research and grouped the articles according to the central tenets of this theory. But first, what is the Critical Race Theory as it pertains to medical training? This is discussed below.

Research Framework

The *Critical Race Theory* framework is useful in investigating the racial disparities in medical training. According to Ladson-Billings and Tate (2006), race continues to be a significant factor in determining inequity in the United States. The Critical Race Theory framework is one way to understand and articulate issues facing marginalized people. The Critical Race Theory (CRT) is grounded in legal scholarship and is a framework to interrogate particulars of a social reality that are defined by peoples' experiences and the collective historical experience of their communities of origin (Matsuda et al., 1993). Critical Race Theory researchers Matsuda and others identify some of the basic tenets of the theory generally as:

1. Racism is ordinary and usual in society; it is a common, everyday experience for most people of color in the US, and it is endemic to American life.
2. CRT practice is skeptical toward dominant legal claims of neutrality, objectivity, color blindness, and meritocracy. CRT recognizes that not everyone has an equal opportunity and racial inequality is nuanced and occurs in random, intentional, and individual acts.
3. Most societal issues arise from historic acts and should be seen in these contexts. Current inequalities and social practices are linked to their historic settings. Racism has contributed to all contemporary manifestations of group advantage and disadvantage along racial lines, including health education.
4. CRT recognizes experiential knowledge of people of color and communities of origin in analyzing law and society. These lived experiences of racism, when reflected upon, can contribute to the elimination of racism.
5. CRT is interdisciplinary and borrows from other traditions including law, liberalism, feminism, Marxism, nationalism, and others.
6. CRT's goal is the elimination of racial oppression as part of the greater goal of ending all forms of oppression.

In education, CRT focuses on how racism is endemic in society and education, and that "racism has become so deeply ingrained in society and schooling's consciousness that it is often invisible" (Brayboy, 2005). Thus, although poverty is a major cause for the poor performance of all students, the combination of underfunded schools and racism in black schools and schools with minoritized students points to institutionalized and structural racism. Additionally, civil rights litigation in education has contributed to decreased funding for schools with minoritized students, with much funding following white flight out of the urban areas (Ladson-Billings & Tate, 1995).

For this study, inclusive learning design acknowledges the importance of "naming one's own reality" or "voice," and that learners construct their reality from their own experiences (Ladson-Billings & Tate, 1995). Inclusive learning design in medical institutions should thus enable learners to use their lived experiences in interacting with course content. This scoping review analyzed literature for the six tenets that define critical race theory: (1). The centrality and intersectionality of race and racism, (2). The challenge to the dominant ideology, (3). Commitment to social justice, (4). The centrality of experiential knowledge, (5). The interdisciplinary perspective, and (6). The elimination of racial oppression in content.

Results

Forty-three articles were identified to address the study and were accessed from the select databases. As shown in Fig. 1 below, the 43 selected articles were drawn from *PubMed, Science Direct, Scopus*, and the hand-searched articles from *Google Scholar* and other databases.

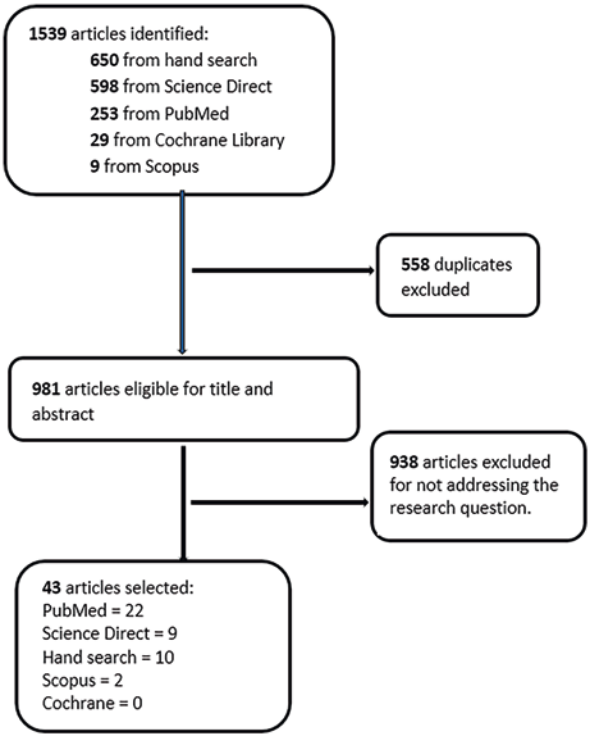

Fig. 1 Flow chart for the extraction of scoping literature review

Analysis

The publications were analyzed for the CRT tenets of (a) Centrality of race, (b) Challenging dominant ideology, (c) Commitment to social justice, (d) Experiential knowledge, (e) Interdisciplinary perspective, and (f) The elimination of racial oppression. The articles reported on interventions to increase equity and inclusion in medical training. Some of these interventions included short courses embedded within the curriculum, courses approved by standards of the Liaison Committee on Medical Education (LCME) and the Accreditation Council for Graduate Medical Education (ACGME), medical conferences, and interviews with staff and trainees.

Regarding the centrality of race in medical training, as shown in Table 1, 39 articles (90%) identified race as being central to addressing racial inequality. One study on the association of race and the treatment of acne (Barbieri et al., 2020) suggested that Black patients were less likely to be prescribed oral antibiotics, diuretics, or vitamins to control acne outbreaks, compared to non-Hispanic White patients. Another study (Brathwaite et al., 2021) suggested that race is a major risk factor for chronic conditions and poor health outcomes for minoritized people in the US. Brathwaite and others note that "The disparate [health] outcomes for Black patients indicates that race often correlates with other social and societal factors that are rooted in structural racism." These societal factors that lead to the poor overall health of minoritized people are also identified by Grobe et al. (2020) in a study on how race moderates responses to smoking cessation treatment. Their findings suggest that motivational interviewing for smoking cessation induction in black patients was less effective compared to non-black patients due to psycho-social variables. Some of these variables include observations that minoritized people had lower socioeconomic statuses, were less likely to be in relationships, started smoking at a later age, and were less likely to be prescribed smoking cessation medications. Perhaps the most significant effects of the centrality of race in health outcomes were revealed by the onset of the Covid-19 pandemic in the US. In a study of 5999 Covid-19 patients, Hu et al. (2021) found that 32% of the patients who died of Covid-19 complications lived in the most disadvantaged neighborhoods, while only 11% of the dead lived in the least disadvantaged neighborhoods. They found that 52% of black, 24% of Hispanic/LatinX, and 8.5% of White patients lived in these disadvantaged neighborhoods. The suburbanization of the major urban US cities in the 1950s that led to the discriminatory "redlining" of neighborhoods by mortgage lenders resulted in the concentration of black people in these neighborhoods, directly contributing to the residents' vulnerability to poor health outcomes. According to Hu et al., living in disadvantaged neighborhoods independently predicted in-hospital Covid-19 mortality.

Additionally, the centrality of race in healthcare is addressed in selected articles that studied the training and staffing patterns of doctors and healthcare professionals in the US. Twenty of the 43 publications address the pre-service and in-service training of doctors and how the professionals' race impacts equity, social justice,

Table 1 Summary of the results of scoping review articles with CRT tenets

CRT tenets	Number of articles (%)	Articles (Authors)
Centrality of race	39 (90%)	Aibana et al. (2019), Arora et al. (2019), Barbieri et al. (2020), Brathwaite et al. (2021), Callahan et al. (2017), Dalla Piazza et al. (2018), Elkbuli et al. (2019), Encisco (2020), Gonzalez et al. (2018), Grobe et al. (2020), Hemal et al. (2021), Hill et al. (2020), Hu et al. (2021), Jammeh et al. (2018, 2019), Krishnan et al. (2019), Lane-Fall et al. (2017), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Mmeje et al. (2020), Nehemiah et al. (2021), Nkansah and Amankwah (2021), Ofili et al. (2021), Ogunwole et al. (2020), Olsen (2019), Ona et al. (2020), Osseo-Asare et al. (2018), Quesada et al. (2021), Ramirez and Franklin (2019), Rosenkranz et al. (2021), Sharma et al. (2018), Solomon et al. (2021), Stepanikova and Oates (2017), Ufomata et al. (2021), West et al. (2019), White-Davis et al. (2018), and Zahedi et al. (2019).
Challenges dominant ideology	26 (60%)	Aibana et al. (2019), Arora et al. (2019), Brathwaite et al. (2021), Callahan et al. (2017), Encisco (2020), Gonzalez et al. (2018), Hemal et al. (2021), Hill et al. (2020), Jammeh et al. (2018, 2019), Krishnan et al. (2019), Lane-Fall et al. (2017), Lett et al. (2019), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Ofili et al. (2021), Ogunwole et al. (2020), Olsen (2019), Ramirez and Franklin (2019), Rosenkranz et al. (2021), Stepanikova and Oates (2017), Ufomata et al. (2021), West et al. (2019), and White-Davis et al. (2018).
Commitment to social justice	32 (74%)	Aibana et al. (2019), Argueza et al. (2021), Arora et al. (2019), Ayalew et al. (2021), Barbieri et al. (2020), Brathwaite et al. (2021), Elkbuli et al. (2019), Encisco (2020), Gonzalez et al. (2018), Hemal et al. (2021), Hill et al. (2020), Hu et al. (2021), Jammeh et al. (2018), Krishnan et al. (2019), Lane-Fall et al. (2017), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Nehemiah et al. (2021), Ofili et al. (2021), Ogunwole et al. (2020), Olsen (2019), Osseo-Asare et al. (2018), Quesada et al. (2021), Ramirez and Franklin (2019), Rosenkranz et al. (2021), Sharma et al. (2018), Stepanikova and Oates (2017), Ufomata et al. (2021), West et al. (2019), and Zahedi et al. (2019).
Experiential knowledge	20 (47%)	Aibana et al. (2019), Argueza et al. (2021), Brathwaite et al. (2021), Elkbuli et al. (2019), Encisco (2020), Gonzalez et al. (2018), Lane-Fall et al. (2017), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Ofili et al. (2021), Olsen (2019), Ona et al. (2020), Prunuske et al. (2019), Ramirez and Franklin (2019), Rosenkranz et al. (2021), Ufomata et al. (2021), West et al. (2019), and Zahedi et al. (2019).

(continued)

Table 1 (continued)

CRT tenets	Number of articles (%)	Articles (Authors)
Interdisciplinary perspective	33 (77%)	Aibana et al. (2019), Argueza et al. (2021), Arora et al. (2019), Ayalew et al. (2021), Barbieri et al. (2020), Brathwaite et al. (2021), Grobe et al. (2020), Hemal et al. (2021), Hill et al. (2020), Hu et al. (2021), Jarman et al. (2019), Krishnan et al. (2019), Lane-Fall et al. (2017), Lett et al. (2019), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Nehemiah et al. (2021), Nkansah and Amankwah (2021), Ofili et al. (2021), Ogunwole et al. (2020), Olsen (2019), Prunuske et al. (2019), Quesada et al. (2021), Ramirez and Franklin (2019), Rosenkranz et al. (2021), Sharma et al. (2018), Stepanikova and Oates (2017), Ufomata et al. (2021), West et al. (2019), White-Davis et al. (2018), and Zahedi et al. (2019).
Elimination of racial oppression	22 (51%)	Aibana et al. (2019), Argueza et al. (2021), Arora et al. (2019), Barbieri et al. (2020), Brathwaite et al. (2021), Hemal et al. (2021), Hill et al. (2020), Jarman et al. (2019), Krishnan et al. (2019), Lane-Fall et al. (2017), Li et al. (2019), Low et al. (2019), McKay et al. (2021), Medlock et al. (2017), Nkansah and Amankwah (2021), Ofili et al. (2021), Ogunwole et al. (2020), Osseo-Asare et al. (2018), Ramirez and Franklin (2019), Stepanikova and Oates (2017), Ufomata et al. (2021), and White-Davis et al. (2018).

and inclusion for minoritized populations. For example, a study by Jarman et al. (2019) suggests that patients from minoritized communities are more likely to seek care from physicians from their racial group. However, because there are few minorities in the medical profession, this has meant that some patients may be reluctant to receive medical care from professionals who are not of their race. Some studies have blamed the dearth of minority doctors in medical school training on the "upstream pipeline," the process that leads to acceptance and training of the academic medicine workforce (Callahan et al., 2017). Other studies noted the centrality of race in that white health professionals comprise the most professionals in this field despite modest minority population increases in the total US population.

On the CRT tenet of challenging the dominant ideology, 26 of the selected articles (60%) identified this tenant in their studies, as shown in Table 1. The studies varied in the way they challenged the dominant ideology. For example, Brathwaite et al. (2021) challenged the dominant ideology by pointing out the equity and inclusion challenges in vascular surgery practices that ultimately negatively affect minoritized individuals. Hemal et al. (2021) also challenge the notion that the number of minorities underrepresented in medicine has continued to grow with time. They note that existing diversity initiatives are failing to achieve their goals and there continues to be little change in the representation of minority surgeons relative

to the US population. Other studies challenged reports that minority student physicians are not mistreated in medical schools (Hill et al., 2020), while others challenged the US racial structures and policies in psychiatry residencies for physicians (Medlock et al., 2017).

The CRT tenet of commitment to social justice was observed in 32 of the 43 articles reviewed (74%). Some of the social justice issues addressed included patient trust, access to healthcare, the right of minorities to participate in clinical trials (Arora et al., 2019), health equity for children (Ayalew et al., 2021), the need for equitable prescription of acne medication prescription to black patients (Barbieri et al., 2020), and the need to re-distribute general surgery residencies across races to increase opportunities for healthcare access for minorities (Elkbuli et al., 2019). One recurrent theme in the articles relating to the commitment to social justice was the call to diversify the workforce to include minoritized practitioners who are likely to serve patients who are black or ethnic minorities and patients who are under-insured. The issues of substandard housing and living conditions were also brought to the forefront by Hu et al. (2021). In a study of 5999 patients, Hu et al. determined survival from Covid-19 disease was dependent on where the patients lived. Patients who lived in poor neighborhoods were more likely to succumb to Covid-19 than those who did not live in these deprived neighborhoods.

However, only 20 of the 43 studies addressed the CRT tenet of experiential knowledge of minorities. These studies reiterated the importance of training minoritized professionals since black and ethnic minoritized patients are more comfortable being treated by physicians with similar racial backgrounds, leading to improved health outcomes (Brathwaite et al., 2021; Li et al., 2019). Additionally, some studies (Elkbuli et al., 2019) noted that encouraging ethnic minorities to acquire general surgery experience exposes these professionals to experience that makes them practice in minoritized communities. McKay et al. (2021) also noted the experiential knowledge of minoritized ethnic communities is lacking in accruing knowledge about their health outcomes because minoritized individuals are not given opportunities to participate in medication trials, like prostate cancer trials. The lived experiences of minoritized communities impact their access and adherence to medical treatment (Medlock et al., 2017).

Thirty-three articles addressed the interdisciplinary perspective tenet of CRT, suggesting 77% of the articles acknowledged the importance of equity across all facets of life. Arora et al. (2019), in analyzing diversity in associations of program directors in surgery, found lack of minority leadership in these organizations was analogous to business and technology spheres. Other scholars found the lack of equity and inclusion in medical practice was also reflected in social, political, economic, and institutional structures (Ayalew et al., 2021; Grobe et al., 2020; West et al., 2019; Zahedi et al., 2019). Some of these interconnections led to patients and their families having no access to health insurance and were thus unlikely to be prescribed necessary medication (Barbieri et al., 2020). The study by Medlock et al. (2017) also found racism is linked to psychiatric symptoms, discrimination, poverty, and aggressive policing. Some studies (Jarman et al., 2019; Ogunwole et al., 2020; and Prunuske et al., 2019), showed that underrepresented minorities who

practice general surgery are more likely to study socio-economic factors and topics pertinent to minority groups, an additional reason why more minorities should be encouraged to practice general surgery. The interdisciplinary perspective is also noted by Li et al. (2019) and Quesada et al. (2021) who found a lack of diversity in all practices of medicine. This lack of diversity is also evident in academic medicine (Nehemiah et al., 2021).

However, only 22 articles (50%) addressed the CRT tenet of elimination of racial oppression which suggested the curriculum was not designed to address this tenet. Nevertheless, several of the studies in the corpus addressed this issue. As a means of eliminating racial oppression, Argueza et al. (2021) called on the authorities to fund anti-racism initiatives in medical training institutions, starting by obtaining data on racial inequities in these institutions. Racial oppression can also be eliminated by providing opportunities to minoritized communities (Brathwaite et al., 2021; Hemal et al., 2021). Racial oppression is also committed when medical training schools use discreet US Medical Licensing Examinations (USMLE) cut-offs that are likely to exclude minoritized applicants at a higher rate than non-minoritized students. Racial oppression is also evident when minority identities are not portrayed in medical education and research; instead, descriptions of minoritized patients are reductionist while their races are not distinguished as a risk factor for diseases (Krishnan et al., 2019; McKay et al., 2021). Some of the studies called for the elimination of racial oppression through education (Medlock et al., 2017; Ufomata et al., 2021) or an increase in a diversified workforce (Nkansah & Amankwah, 2021; Ofili et al., 2021), and race-conscious admissions policies that lead to anti-racism (Ogunwole et al., 2020).

Discussion and Analysis

The research question for this study was: "To what extent do US medical institutions use inclusive learning design to sensitize medical professionals in addressing social inequity and systemic racism in their practice?" When viewed against the CRT tenets of (a) The centrality of race, (b) Challenging the dominant ideology, (c) Commitment to social justice, (d) Experiential knowledge, (e) Interdisciplinary perspective, and (f) Elimination of racial oppression, US medical training institutions have not shown a robust response to an inclusive learning design.

This scoping review of 43 representative studies completed in the last five years (2017–2021) indicates that 89% of the studies identified the centrality of race in addressing social inequity in the practice of medicine. This CRT tenet had the highest response overall. Similarly, 74% of the studies articulated the tenet of social justice in healthcare, and 77% acknowledged the interdisciplinary perspective of healthcare and health outcomes for minoritized individuals in the US. However, only 60% of the studies indicated the CRT tenet of challenging the dominant ideology, while 51% referred to the tenet of elimination of racial oppression. Only 47% of the studies considered minoritized patients' and doctors' experiential knowledge.

These results lead me to suggest most training institutions recognize race has played a central role in the poor health outcomes of minoritized and ethnic people. Often health institutions, healthcare research projects, issuance of prescription medication, and medical training schools have been dominated by white males who are not representative of minoritized individuals. However, these training institutions recognize, to some extent, the social injustice perpetrated by lack of access to healthcare or the absence of physicians from ethnic and minoritized groups. These poor health outcomes are also evident in other aspects of ethnic and minoritized peoples' lives, including socio-economic activities, thus perpetuating a cycle of poverty and poor health.

The results also led me to suggest that over the last five years, the elimination of racial oppression in US medical training institutions still needs more emphasis. Additionally, these institutions have not taken advantage of the experiential knowledge of ethnic and minoritized individuals in the provision of healthcare. This includes the experiential knowledge of the healthcare professionals and even the minoritized patients they serve. Finally, these institutions appear reluctant to challenge the dominant ideology, instead, they appear to view healthcare as neutral, objective, color blind, or meritorious. As suggested by the studies, racial inequality in medical training institutions still occurs both unwittingly and intentionally.

The results of this limited scoping study suggest that, over the last five years (2017–2021), US medical institutions are still grappling with how to sensitize medical professionals in addressing social inequity and systemic racism in their practice. As measured against the CRT tenets, these institutions are successfully tackling some of these problems but the issues of leveraging the experiential knowledge of ethnic and minoritized individuals still elude most of them. The institutions are also unable or unwilling to challenge the dominant ideology of the neutrality of healthcare and are yet to act decisively to eliminate racial oppression that contributes to poor health outcomes for ethnic and minoritized individuals in the US.

References

Aibana, O., Swails, J. L., Flores, R. J., & Love, L. (2019). Bridging the gap: Holistic review to increase diversity in graduate medical education. *Academic Medicine, 94*(8), 1137–1141.

Aluko, Y. (2008). American Medical Association apologizes for racism in medicine. *Journal of the National Medical Association, 100*(10), 1246–1247.

Argueza, B. R., Saenz, S. R., & McBride, D. (2021). From diversity and inclusion to antiracism in medical training institutions. *Academic Medicine, 96*(6), 798–801.

Arora, T. K., Dent, D., Morris-Wiseman, L., & Nfonsam, V. (2019). Diversity in the last decade of the association of program directors in surgery: A descriptive analysis of leadership and future directions. *Journal of Surgical Education, 76*(6), e125–e131.

Ayalew, B., Dawson-Hahn, E., Cholera, R., Falusi, O., Haro, T. M., Montoya-Williams, D., & Linton, J. M. (2021). The health of children in immigrant families: Key drivers and research gaps through an equity lens. *Academic Pediatrics, 21*, 777–792.

Bailey, Z. D., & Moon, J. R. (2020). Racism and the political economy of COVID-19: Will we continue to resurrect the past? *Journal of Health Politics, Policy, and Law, 45*(6), 937–950.

Barbieri, J. S., Shin, D. B., Wang, S., Margolis, D. J., & Takeshita, J. (2020). Association of race/ethnicity and sex with differences in health care use and treatment for acne. *JAMA Dermatology, 156*(3), 312–319.

Brandt, A. M. (1978). Racism and research: The case of the Tuskegee syphilis study. *Hastings Center Report, 8*, 21–29.

Brathwaite, S., West-Livingston, L., Williams, D. A., Blakely, C., Rice, J., & Alabi, O. (2021). Moving forward: Recommendations to overcome existing structural racism. *Journal of Vascular Surgery, 74*(2), 47S–55S.

Brayboy, B. M. J. (2005). Toward a tribal critical race theory in education. *The Urban Review, 37*(5), 425–446.

Callahan, E. J., Banks, M., Medina, J., Disbrow, K., Soto-Greene, M., & Sánchez, J. P. (2017). Providing diverse trainees an early and transparent introduction to academic appointment and promotion processes. *MedEdPORTAL: The Journal of Teaching and Learning Resources, 13*, 10661. https://doi.org/10.15766/mep_2374-8265.106

Chowkwanyun, M., & Reed, A. (2020). Racial health disparities and Covid-19 – Caution and context. *The New England Journal of Medicine, 383*(3), 201–203.

Dalla Piazza, M., Padilla-Register, M., Dwarakanath, M., Obamedo, E., Hill, J., & Soto-Greene, M. L. (2018). Exploring racism and health: An intensive interactive session for medical students. *MedEdPORTAL, 14*.

Dennis, G. C. (2001). Racism in medicine: Planning for the future. *Journal of the National Medical Association, 93*(3 Suppl), 1S–5S.

Elkbuli, A., Narvel, R. I., Dowd, B., McKenney, M., & Boneva, D. (2019). Distribution of general surgery residencies in the United States and gender inequality: Are we there yet? *Journal of Surgical Education, 76*(6), 1460–1468.

Encisco, J. M. (2020). Teaching culturally competent healthcare in neonatal-perinatal medicine. *Seminars in Perinatology, 44*(4), 151239.

Gonzalez, C., Deno, M., Kintzer, E., Marantz, P., Lypson, M., & McKee, M. (2018). Patient perspectives on racial and ethnic implicit bias in clinical encounters: Implications for curriculum development. *Patient Education and Counseling, 101*(9), 1669–1675.

Grobe, J. E., Goggin, K., Harris, K. J., Richter, K. P., Resnicow, K., & Catley, D. (2020). Race moderates the effects of motivational interviewing on smoking cessation induction. *Patient Education and Counseling, 103*(2), 350–358.

Hemal, K., Reghunathan, M., Newsom, M., Davis, G., & Gosman, A. (2021). Diversity and inclusion: A review of effective initiatives in surgery. *Journal of Surgical Education., 78*, 1500–1515.

Hill, K. A., Samuels, E. A., Gross, C. P., Desai, M. M., Sitkin Zelin, N., Latimore, D., Huot, S. J., Cramer, L. D., Wong, A. H., & Boatright, D. (2020). Assessment of the prevalence of medical student mistreatment by sex, race/ethnicity, and sexual orientation. *JAMA Internal Medicine, 180*(5), 653–665.

Hu, J., Bartels, C. M., Rovin, R. A., Lamb, L. E., Kind, A. J., & Nerenz, D. R. (2021). Race, ethnicity, neighborhood characteristics, and in-hospital coronavirus disease-2019 mortality. *Medical Care, 59*, 888–892. https://doi.org/10.1097/mlr.0000000000001624

Jammeh, M. L., Adibe, O. O., Tracy, E. T., Rice, H. E., Clark, R. H., Smith, P. B., & Greenberg, R. G. (2018). Racial/ethnic differences in necrotizing enterocolitis incidence and outcomes in premature very low birth weight infants. *Journal of Perinatology, 38*(10), 1386–1390. https://doi.org/10.1038/s41372-018-0184-x

Jarman, B. T., Kallies, K. J., Joshi, A. R., Smink, D. S., Sarosi, G. A., Chang, L., Green, J. M., Greenberg, J. A., Melcher, M. L., Nfonsam, V., Ramirez, L. D., Borgert, A. J., & Whiting, J. (2019). Underrepresented minorities are underrepresented among general surgery applicants selected to interview. *Journal of Surgical Education, 76*(6), e15–e23.

Krishnan, A., Rabinowitz, M., Ziminsky, A., Scott, S. M., & Chretien, K. C. (2019). Addressing race, culture, and structural inequality in medical education. *Academic Medicine, 94*, 550–555.

Ladson-Billings, G., & Tate, W. F. (1995). Toward a critical race theory of education. *Teachers College Record, 97*(1), 47–68.

Ladson-Billings, G., & Tate, W. F. (Eds.). (2006). *Education research in the public interest: Social justice, action, and policy*. Teachers College Press, Columbia University.

Lane-Fall, M. B., Miano, T. A., Aysola, J., & Augoustides, J. (2017). Diversity in the emerging critical care workforce: Analysis of demographic trends in critical care fellows from 2004 to 2014. *Critical Care Medicine, 45*(5), 822–827. https://doi.org/10.1097/CCM.0000000000002322

Lett, L. A., Murdock, H. M., Orji, W. U., Aysola, J., & Sebro, R. (2019). Trends in racial/ethnic representation among US medical students. *JAMA Network Open, 2*(9), e1910490. https://doi.org/10.1001/jamanetworkopen.2019.10490

Li, S. N. J., Siddiqi, J., Mahmood, A., & Khosa, F. (2019). Equity diversity, and inclusion in academic internal medicine at US medical schools. *European Journal of Internal Medicine, 71*, 89–91.

Low, D., Pollack, S. W., Liao, Z. C., Maestas, R., Kirven, L. E., Eacker, A. M., & Morales, L. S. (2019). Racial/ethnic disparities in clinical grading in medical school. *Teaching and Learning in Medicine, 31*(5), 487–496.

Matsuda, M., Lawrence, C., Delgado, R., & Crenshaw, K. (Eds.). (1993). *Words that wound: Critical race theory, assaultive speech, and the first amendment*. Westview Press.

McKay, R. R., Gold, T., Zarif, J. C., Chowdhury-Paulino, I. M., Friedant, A., Gerke, T., Grant, M., Hawthorne, K., Heath, E., Huang, F. W., Jackson, M. D., Mahal, B., Ogbeide, O., Paich, K., Ragin, C., Rencsok, E. M., Simmons, S., Yates, C., Vinson, J., et al. (2021). Tackling diversity in prostate cancer clinical trials: A report from the diversity working group of the IRONMAN registry. *JCO Global Oncology, 7*, 495–505.

Medlock, M., Weissman, A., Wong, S. S., Carlo, A., Zeng, M., Borba, C., Curry, M., & Shtasel, D. (2017). Racism as a unique social determinant of mental health: Development of a didactic curriculum for psychiatry residents. *MedEdPORTAL, 13*.

Milem, J. F., Dey, E. L., & White, C. B. (2004). Diversity consideration in health professions education. In B. D. Smedley, B. A. Stith, & L. R. Bristow (Eds.), *In the nation's compelling interest: Ensuring diversity in the health-care workforce* (Institute of Medicine (US) Committee on Institutional and Policy-Level Strategies for Increasing the Diversity of the U.S. Healthcare Workforce). National Academies Press. Retrieved from: https://www.ncbi.nlm.nih.gov/books/NBK216014

Mmeje, O., Price, E. A., Johnson, T. R., & Fenner, D. E. (2020). Galvanizing for the future: A bottom-up departmental approach to diversity, equity, and inclusion. *American Journal of Obstetrics and Gynecology, 223*(5), 715.

Navas, C., Tisi, V., & Close, T. (2021). Grassroots organization and justice through social media. In R. M. Horton (Ed.), *Critical perspectives on social justice in speech-language pathology* (pp. 262–284). IGI Global. https://doi.org/10.4018/978-1-7998-7134-7

Nehemiah, A., Roberts, S. E., Song, Y., Kelz, R. R., Butler, P. D., Morris, J. B., & Aarons, C. B. (2021). Looking beyond the numbers: Increasing diversity and inclusion through holistic review in general surgery recruitment. *Journal of Surgery Education, 78*, 763–769.

Nkansah, R., & Amankwah, K. S. (2021). Racial disparities in vascular surgery: An analysis of race and ethnicity among US medical students, general surgery residents, vascular surgery trainees, and the vascular surgery workforce. *Journal of Vascular Surgery, 74*(2), 33S–46S.

Ofili, E. O., Sarpong, D., Yanagihara, R., Tchounwou, P. B., Fernández-Repollet, E., Malouhi, M., Idris, M. Y., Lawson, K., Spring, N. H., & Rivers, B. M. (2021). The Research Centers in Minority Institutions (RCMI) consortium: A blueprint for inclusive excellence. *International Journal of Environmental Research and Public Health, 18*(13), 6848. https://doi.org/10.3390/ijerph18136848

Ogunwole, S. M., Dill, M., Jones, K., & Golden, S. H. (2020). Trends in internal medicine faculty by sex and race/ethnicity, 1980–2018. *JAMA Network Open, 3*(9), e2015205.

Olsen, L. D. (2019). The conscripted curriculum and the reproduction of racial inequalities in contemporary US medical education. *Journal of Health and Social Behavior, 60*(1), 55–68.

Ona, F. F., Amutah-Onukagha, N. N., Asemamaw, R., & Schlaff, A. L. (2020). Struggles and tensions in antiracism education in medical school: Lessons learned. *Academic Medicine, 95*(12S), S163–S168.

Osseo-Asare, A., Balasuriya, L., Huot, S. J., Keene, D., Berg, D., Nunez-Smith, M., Genao, I., Latimore, D., & Boatright, D. (2018). Minority resident physicians' views on the role of race/ethnicity in their training experiences in the workplace. *JAMA Network Open, 1*(5), e182723. https://doi.org/10.1001/jamanetworkopen.2018.2723

Prunuske, A., Houss, B., & Wirta, K. A. (2019). Alignment of roles of near-peer mentors for medical students underrepresented in medicine with medical education competencies: A qualitative study. *BMC Medical Education, 19*(1), 417.

Quesada, P. R., Solis, R. N., Ojeaga, M., Yang, N. T., Taylor, S. L., & Diaz, R. C. (2021). Overemphasis of USMLE and its potential impact on diversity in otolaryngology. *OTO Open, 5*(3).

Ramirez, R. N., & Franklin, C. C. (2019). Racial diversity in orthopedic surgery. *The Orthopedic Clinics of North America, 50*(3), 337–344. https://doi.org/10.1016/j.ocl.2019.03.010

Richler, D. (2021). *Commit to inclusion. Make the commitment: Commit to inclusion.* Retrieved from http://committoinclusion.org/

Rosenkranz, K., Arora, T., Termuhlen, P., Stain, S., Misra, S., Dent, D., & Nfonsam, V. (2021). Diversity, equity, and inclusion in medicine: Why it matters and how do we achieve it? *Journal of Surgical Education, 78*(4), 1058–1065.

Sharma, M., Pinto, A., & Kumagai, A. (2018). Teaching the social determinants of health: A path to equity or a road to nowhere? *Academic Medicine, 1*, 25–30.

Solomon, S. R., Atalay, A. J., & Osman, N. Y. (2021). Diversity is not enough: Advancing a framework for antiracism in medical education. *Academic Medicine, 96*(11), 1513–1517.

Stepanikova, I., & Oates, G. R. (2017). Perceived discrimination and privilege in health care: The role of socioeconomic status and race. *American Journal of Preventive Medicine, 52*(1S1), S86–S94. https://doi.org/10.1016/j.amepre.2016.09.024

Ufomata, E., Merriam, S., Puri, A., Lupton, K., LeFrancois, D., Jones, D., Nemeth, A., Snydman, L. K., Stark, R., & Spagnoletti, C. (2021). A policy statement of the society of general internal medicine on tackling racism in medical education: Reflections on the past and a call to action for the future. *Journal of General Internal Medicine, 36*(4), 1077–1081.

United States Department of Health and Human Services. Task Force on Black, & Minority Health. (1985). *Report of the Secretary's task force on Black & Minority Health: Crosscutting issues in minority health* (Vol. 2). US Department of Health and Human Services.

West, T. J., Loomer, K., & Wyatt, T. R. (2019). How diverse is your universe? An activity for students to reflect on ethno-racial diversity during orientation. *MedEdPORTAL: The Journal of Teaching and Learning Resources, 15*, 10840.

White-Davis, T., Edgoose, J., Speights, J. S. B., Fraser, K., Ring, J. M., Guh, J., & Saba, G. W. (2018). Addressing racism in medical education: An interactive training module. *Family Medicine, 50*(5), 364–368.

Yousif, H., Ayogu, N., & Bell, T. (2020). The path forward: An antiracist approach to academic medicine. *The New England Journal of Medicine, 383*(15), e91.

Zahedi, S., Colvill, K., Lopez, M., & Phillips, L. G. (2019). Implications of demographics and socioeconomic factors in breast cancer reconstruction. *Annals of Plastic Surgery, 83*(4), 388–391.

Transformative Learning Experiences Through Technology: Bringing Learners Together to Address Equity and Social Justice through Project-Based Language Learning in the Online Classroom

Rachel Mamiya Hernandez, Kelly Barros Santos, and Julia Vasconcelos Gonçalves Matos

The events of the past year, the COVID-19 pandemic, economic instability, racial and political violence, and racial justice protests, have undoubtedly reshaped all sectors of society, including education. For those of us who work in education, these events underscored the importance of our multifaceted roles in the lives of our students and the transformative nature of our profession, highlighting the need for more responsive, meaningful, and equitable instruction rooted in social justice. And yet, it may often seem daunting to think about where to start, what actions to take, and how to embed these issues into our learning design.

One way of fostering a more responsive, just, and engaging learning experience is through Project-Based Learning (PBL). An offshoot of Project-Based Learning, Project-Based Language Learning (PBLL), uses meaningful inquiry to enable students to interact with language, communities, and content. It is by nature multidisciplinary, requiring language learners to work collaboratively, guided by inquiry, on a public product for an authentic audience. As defined by PBL Works (2018), High Quality Project-Based Learning (HQPBL) practices include: intellectual challenge, authenticity, a public product, collaboration, and reflection. Using this framework, students engage in a high-interest social justice-oriented project which incorporates elements of identity, diversity, justice, and action from the Social Justice Standards, created by Learning for Justice (2018), part of the Southern Poverty Law Center. The purpose of this study is to understand student perceptions of and experiences with social justice-oriented project-based learning in an online learning environment. It examines a project in which university students

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from the United States and Brazil collaborated virtually on a project to address issues of literacy and representation creating a multimodal, bilingual children's e-book that celebrates Black heroes from Brazil, the U.S., the Democratic Republic of the Congo, Nigeria, Senegal, South Africa, Mexico, and Portugal.

The issues that the project sought to address were manifold. The first addressed building early literacy skills, particularly for learners in low-income communities, speaking to the lack of representation in children's literature, and highlighting the accomplishments and humanity of Black heroes. In a study on representation of African-American characters in a North American children's literature, Hefflin and Barksdale-Ladd (2001) point out that representation and identification can be powerful motivators for young readers stating, "culturally sensitive stories, views, and insights can allow children to realize that literature has value for them as individuals" (p. 810). An e-book was chosen as the final, public facing project for multiple reasons, including ease of collaboration, reaching a wider audience, and the affordances of multimodality. Recent research has pointed to the benefits of multimodal audio books in vocabulary building for young learners (Kelley et al., 2020). From the outset, there were numerous considerations taken into account. A frequent criticism of PBL is that, in certain cases, it can be framed as one sided, lop-sided, or at worst reinforcing savior complex dynamics (Cortes, 2018). In designing this project, we were cognizant of this and worked to ensure true collaboration. Students involved in the project were not merely creators, they also benefited from using the languages they were learning in a real-world context, engaging in sustained inquiry and learning about important historical and contemporary figures of Black liberation throughout the Americas, synthesizing their research, and working collaboratively in the co-creation process. Adopting a constructivist design, the bilingual nature of the project allowed each student to serve as the "expert" or more knowledgeable partner at different instances as they worked on the book together.

Technology was indeed an integral and inseparable part of this project. However, it is important to recognize the role of technology in this project was, as Bell (2010) states, "a means and not an end" (p. 42). Tillberg-Webb and Collier (2018) point out that many innovative learning environments are not only constructivist, but also constructionist. Constructionism (Papert, 1980) is a learning theory that centers on learner agency; from the constructionist standpoint meaningful learning is brought about by learners' active engagement in designing, building, or making a tangible product. In this view, through designing, programming, or creating the process of learning is transformed and new knowledge is seen as a source of power for learners (Papert, 1980). Rooted in constructivist and constructionist perspectives, a variety of technologies were integrated at all stages of the project to enable collaboration, deepen inquiry, foster learning through making, and eventually enable sharing with a wider audience.

Objectives and Methods

The overall objectives for the project and study were the following:

1. To engage learners in meaningful language use.
2. To deepen their awareness of representation and social justice.
3. To design, examine, and apply collaborative project-based language learning in an online learning environment.

Accordingly, a mixed methods study design was used to examine learners' perceptions of and experiences with the project design and processes. A questionnaire was developed to capture learner perceptions of and experiences with the project. The items were based on the High Quality Project-Based Learning Practices as outlined by PBL Works and the Social Justice Standards by Learning for Justice (2018). It contained 24 Likert-type items on the dimensions of intellectual challenge, authenticity, collaboration, project management, identity, diversity, justice, and action. Additionally, the questionnaire included a reflection section with four open-ended questions on learners' overall experiences with the project. Peer debriefing sessions were conducted to discuss the themes and findings.

Project Context and Goals

In addition to being academic work, this project covered issues of identity and representation. However, before mentioning these topics, it is necessary to understand the ethnic and social context of Brazilian students. Students from Universidade Federal do Recôncavo da Bahia are mostly Black, and largely from public schools, and thus did not have many opportunities to learn a foreign language. In the context of Brazilian public schools, English learning is officially part of educational policies; however, in practice it is largely neglected by government administrations and there is no real material investment for English teaching to be considered as a relevant pedagogic tool. On the other hand, for those who study in private schools English is seen as necessary for social mobility and academic development. Thus, access to English language learning in Brazil belongs to those who can pay for such a commodity; it belongs to a small group-elite that takes up places of power.

Similarly, the students from the U.S. university also came largely from public schools. They were studying at a large, state university in the Pacific and all but one had never formally studied Portuguese before college. In the U.S., Portuguese is considered a Less Commonly Taught Language (LCTL), thus it is relatively rare to find Portuguese language programs outside universities in K-12 institutions. So, overall access to the Portuguese language for most learners in this group was quite limited.

In this sense, the project was set up as an opportunity for students to become English or Portuguese speakers without the constraints of grammar structures and

without thinking about the limitations. When it came time to write and create the texts, there was an opportunity for intercultural exchanges where all students were able to communicate, speak about themselves, and negotiate linguistic and social meanings. In this way everyone was able to take risks and make decisions about the production of work, in both languages and according to the needs of each speaker. Predictably, there were also a number of challenges due to group dynamics and unresponsive or uncooperative group members. When problems were reported, instructors did their best to help troubleshoot, resolve them, nudge those who were not responsive, and even sometimes change group members if things were not working out.

Since the participants were from different countries, nationalities, contexts, this collective action was designed to be a social justice project, to work as an anti-racist political activity, and to promote respectful dialogues between peoples, mainly because the texts were about the importance of Latin, American and Brazilian Black heroes/warriors. To speak and write about people who have fought for human rights or who have been involved in the movements for Black liberation was undoubtedly a way of making students feel represented in the e-book itself. Most of the students could see themselves in the pages of the material and recognize the strength of the characters' voices. These achievements are greater than the acquisition of language, they are conquests of a representative place.

Participants

As previously mentioned, this project was co-collaborative and involved two English language classes from Brazil and one Portuguese language course from the U.S. To gain insight into student perspectives on the project, a questionnaire was developed based on the HQPBL essential elements and dimensions on social justice from the standards by Learning for Justice (2018). The questionnaire also included an open-ended reflection prompt at the end. There was a 70% response rate for the questionnaire. Sixty-eight percent of the respondents identified as female, while 25% identified as male, and 7% identified as non-binary. In total, 61% of the respondents were from a Brazilian university and 39% were from an American university. With respect to racial identification, 29% of respondents identified as Black, 29% as white, 14% as Asian, 25% as multiracial, and 3% self-identified as "Latina." The respondents ranged in age from 18 to 40, with the average age being 22 years old.

Project Design

Backwards design was used in developing this project; that is the final public product was conceived of first and then the steps towards reaching that product goal were outlined. These steps were written out in both English and Portuguese and became the overall blueprint for the project. In all, five main steps or phases were identified: research, write, visualize, record, and put the book together. Checklists based on the principles of High Quality Project-based Learning (HQPBL) and the Social Justice Standards from Learning for Justice were used to help ensure that the overall project was aligned with the standards or had elements of HQPBL. In terms of project management, deliverables were added to each step to ensure that learners would have a clear goal for each phase of the project.

The e-Book

As previously stated, the result of this research was a collaborative public product organized as a bilingual children's e-book that celebrates 26 Black heroes from Brazil, the U.S., the Democratic Republic of the Congo, Nigeria, Senegal, South Africa, Mexico, and Portugal. The title of the e-book is "The ABCs of Black History" and each page presents the biography of one of the Black figures, organized in alphabetical order. The biographies were written by the students both in English and Portuguese and are accompanied by audio recordings of both versions. Furthermore, a visual representation was created by the students to represent the Black figures covered by the e-book. It was put together and published on the Book Creator site (Fig. 1).

As Bishop (1990) posits, books can serve as mirrors, windows, and sliding glass doors for learners. They can reflect and affirm learners' identity and experiences, while also allowing them to look or pass through and better understand the

Fig. 1 Image of cover and sample page from the ABCs of Black History e-book

lived-experiences or cultures of others. After the conclusion of the project, publishing the e-book online, we were invited to share the project and book with a kindergarten class from the Gira-Girô school in Brazil during an online synchronous meeting. This was a great opportunity for us to gain feedback on the public product from an authentic audience. Surely this was a moment to know if we had designed the e-book for the right audience, if we had chosen the appropriate language and if the pictures were attractive to these young learners. During this presentation, our students talked to the children, answered questions, and spoke about the importance of these stories for their learning. The kids asked about some Black figures from the e-book and mentioned some other names that could be added in future editions, like Mateus Alelulia, a traditional Black musician from Recôncavo da Bahia. Having them making contributions meant that they connected with the stories in the book and felt invested in it. It is our hope that as it did for the children from Gira-Girô, this e-book will continue to serve as a mirror, window, and door in affirming identity and culture, and connecting with and understanding the experiences of others.

Learner Perspectives

With respect to authenticity, 82% of the participants agreed or strongly agreed that the project allowed them to connect with the world beyond their university. Having a public product for a defined audience is seen as an essential element for strengthening authenticity in PBL experiences and this was indeed confirmed by the students who participated in this project. Seventy-nine percent of those surveyed agreed or strongly agreed that working on the project allowed them to demonstrate their learning. Furthermore, 86% indicated that they were motivated by the knowledge that the final product would be public. The reality of having a public audience also proved to be an important part of this project for the vast majority of students. While they were in the process of working on the project, 93% reported that they thought about the audience as they worked.

Turning to the dimensions of social justice in the project design, in terms of identity 72% of the students surveyed felt that working on the project helped them to recognize traits of the dominant culture, their home culture, and other cultures. In particular, one student talked about how working on the project made her challenge her own preconceived notions stating, “I thought it would be difficult to communicate with children but I realized that children receive information more openly than adults and that this perceived difficulty was a reflection of my own deconstruction in a racist society.” Another highlighted how the project spoke to her identity, affirming, “As a Black woman, it was really special for me to participate in building this important and meaningful project, since we need to think about representation so that we all may be antiracist.” In addition to connecting to her identity, here we see how she brings forth the importance of meaningful representation as a conscious and deliberate step to being antiracist.

Dimensions of diversity were also strongly rated. Seventy-one percent of participants felt that their work on the project allowed them to express curiosity about the history and lived experiences of others and exchange ideas and beliefs in an open-minded way. The ideas of visibility and representation were central to our conception of this project. Helping our students understand the history and lived experiences of others and empowering them to share what they had learned with a wider audience were at the heart of this project. Speaking to the idea of visibility (or rather invisibility), one student said, "I learned more about the history of important people, who were often made invisible. Some I was already familiar with; however, I was unaware of some of the facts about their stories." Another student alluded to how the project brought to life these important figures in Black liberation writing, "I read about and had the opportunity to also get to know unimaginable people and cultures, both current and historical. It was a very gratifying experience, I was enchanted by the figures I researched, for every page in the book, it was the most beautiful part of this semester." Building these empathetic connections to help learners better understand the struggles, history, and lived experiences of others is a fundamental component of teaching with social justice. Another student mentioned how this project helped her not only understand the lived experience of Civil Rights figures, but how it helped her understand the connections between struggles for Black liberation and democracy in both countries (Brazil and the U.S.) stating, "Throughout this process, I learned about key Afro-Brazilian civil rights leaders and made global connections between two countries' struggles to increase democracy, citizenship, and human rights for all."

Antiracist scholar Ibram X. Kendi reminds us that, "The soul of justice breathes life, freedom, equality, democracy, human rights, fairness, science, community, opportunity, and empathy for all." (2020, para. 24). Empathy is an essential yet often overlooked element of social justice. Considering this key role of empathy, it is important that we find ways to build empathy through our learning designs. In our project, empathy was approached in two different ways. First, as mentioned above, was in building empathy through understanding the lived experiences of others in their research on historical figures, and secondly, through building interpersonal empathy within the student groups through collaboration. This interpersonal form of empathy was reflected in the survey results; 71% of the students agreed or strongly agreed that their efforts on the project helped them to relate to and build connections with other people by showing them empathy, respect and understanding, regardless of their similarities or differences. In reflecting on the project, one student observed, "I learned to be more empathetic, especially when coming into contact with cultures totally different from my own."

Regarding the concept of justice, 89% of those surveyed agreed that working on the project helped them identify figures, groups, events, and a variety of strategies and philosophies relevant to the history of social justice around the world. And with respect to action, 89% of participants felt that engaging in this project has helped them express empathy when people are excluded or mistreated because of their identities. Furthermore, several mentioned the impact that they hoped the book would have on its audience. One student affirmed, "It's very important to be

antiracist and when working with children, it's essential because they are our future." Echoing this sentiment another student emphasized her desire to inspire others stating, "Children of all ages will benefit from these stories and hopefully, inspire actions toward a more just society."

One challenging aspect of PBL is finding a balance between structure and student voice and choice. Finding the right tension between a highly structured project and one that is truly student-generated can be tricky. Given the affordances and constraints of the project being carried out online, we opted for a more structured approach. This approach was also important considering that we were working with students from vastly different cultures and contexts.

Students' concern regarding the impact of the e-book on the lives of others emphasized the relevance of this project to promote their creativity, choice and empowerment. Throughout the discussion of social justice, the elaboration of an e-book, and cross-cultural interactions built elements for student choice and creativity. After setting the assignment goals together and providing them with a step-by-step process, students could choose which important contemporary or historical Black figure they wanted to focus on and how they would present their information, so they were able to make choices best suited to their purpose. They were also given the freedom to choose the resources that they wanted to use for their research. Another element of choice came in terms of visual representation and how they chose to represent their figure, some choose to create digital or hand drawings, while others chose to remix photos, creating digital collages. Additionally, groups decided on their overall page layout, color scheme, and font choice. In spite of this, 29% of the participants felt that the project did not give them opportunities to choose what they wanted to work on. This speaks to the difficulties in designing a cohesive project for a large, diverse group of students; while a more rigid design provided structure for the project, it allowed less voice and choice on the part of the students.

Since the target audience of the e-book is children, students had to make use of their expertise and skills to create something that would not only fulfill the requirements of the project but also be meaningful to the readers. One student mentioned "This project was great because it helped us really apply our skills to something that will make an impact on others." This comment reflects the reality that centering students as the major developers of the project created a sense of empowerment, crucial to learning in this era. To empower students is the process through which learners gain the ability to make decisions and implement changes in their own lives and in the lives of others; as another student commented, "I do like the ability to produce work for children to help them learn."

Conclusions

In contemplating the roles and responsibilities of language learners (and in turn educators), Osborn (2006) points out that since language education has typically served those who have had access to higher education, "the rights and duties

assigned language classrooms should include the responsibility to utilize the social advantages they have in the service of a greater good of social justice" (p. 135). While truly addressing issues of inequity and social justice require much broader systemic changes, we want to encourage others to contribute however they can to achieve a more just, equitable education for all. Action and activism can be carried out in many ways and can also be infused into the learning environments and dynamic experiences we create. Further, drawing on our experiences in project design and implementation, we encourage continuing discussion of ways in which educators and/or instructional designers can plan projects that include elements of identity, diversity, justice and action, and foster greater intercultural competence in these areas.

References

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House, 83*(2), 39–43. https://doi.org/10.1080/00098650903505415

Bishop, R. S. (1990). Mirrors, windows, and sliding glass doors. *Perspectives, 6*(3), ix–xi.

Cortes, F. (2018, September 11). *The white savior complex. Adolescent learners in urban contexts*. https://wp.nyu.edu/urbanyouthnyu/2018/09/10/the-white-savior-complex/

Hefflin, B. R., & Barksdale-Ladd, M. A. (2001). African American children's literature that helps students find themselves: Selection guidelines for grades K-3. *The Reading Teacher, 54*(8), 810–819.

Kelley, E. S., Barker, R. M., Peters-Sanders, L., Madsen, K., Seven, Y., Soto, X., Olsen, W., Hull, K., & Goldstein, H. (2020). Feasible implementation strategies for improving vocabulary knowledge of high-risk preschoolers: Results from a cluster-randomized trial. *Journal of Speech, Language, and Hearing Research, 63*(12), 4000–4017. https://doi.org/10.1044/2020_JSLHR-20-00316

Kendi, I. X. (2020, November). A Battle between the two souls of America. *The Atlantic*. https://www.theatlantic.com/ideas/archive/2020/11/americas-two-souls/617062/

Learning for Justice. (2018). *Social justice standards: The learning for justice anti-bias framework*. https://www.learningforjustice.org/frameworks/social-justice-standards

Osborn, T. A. (2006). *Teaching world languages for social justice: A sourcebook of principles and practices*. Routledge.

Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. Basic Books.

PBL Works. (2018). *A framework for high quality project-based learning*. https://hqpbl.org/wp-content/uploads/2018/03/FrameworkforHQPBL.pdf

Tillberg-Webb, H., & Collier, N. (2018). Using the design thinking cycle to tell the story of innovative learning spaces. In *Educational technology and narrative* (pp. 141–153). Springer. https://doi.org/10.1007/978-3-319-69914-1_12

Part V
Diversity, Equity, and Inclusion

"Faced with Given Circumstances": A Localized Context of Use Approach

Kristin Herman, John Baaki, and Monica W. Tracey

> "What is it that human beings do when faced with a given circumstance?"
>
> Isabel Wilkerson from *Caste: The Origins of Our Discontents*

Schunk (1991) describes learning as the enduring change resulting from practice or other forms of experience. The design of learning is then the design of change. As such, the field of instructional design (ID) is uniquely positioned as a generation calls for change in its efforts to be more diverse, equitable, and inclusive. Yet the call for systemic change is so large and broad that, without scaling back context, we risk merely proposing theoretical design interventions while day-to-day learning practice continues inequitably.

Approaches to systemic inequities in ID are often unified by the term "intention." Sockman et al. (2020) suggest systemic racism can only be rooted out and equitable conditions prevail by the *intentional* examination of our processes. Kimmons (2020) leverages a more loaded call to action, suggesting the field has *intentionally* ignored such issues as discriminatory design and the digital divide (emphasis added in both instances). These concerns are not new; almost two decades ago, Thomas et al. (2002) were troubled by the "culturally neutral position" (p. 40) that so many in the field of instructional technology were willing to take.

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Of course, since its inception, design education and practice has never been neutral. Bradshaw (2018) layers a timeline of critical (American) social justice events over a timeline of milestone events in the development of the field of instructional design and technology, suggesting claims of neutrality allow our field to remain trapped in a collective ignorance of hidden systems and structures. In a society where a framework as obscure as critical race theory has been misinterpreted and politicized to the point of silencing educators for mentioning diversity or inequity, neutrality is, understandably, attractive. Neutrality protects one's livelihood. However, for those with secure job placements, Cochrane et al. (2017) notes that having the choice to intentionally not engage with issues of power inequities and institutional challenges is the ultimate example of privilege. Intentionally refusing to engage fails to provide an environment where effective learning—where effective change—can take place.

Reframing Wilkerson's question above, what is it that instructional designers do when faced with a given circumstance of inequity, a lack of diversity, and/or an instance of non-inclusion? A localized context of use approach (Baaki & Tracey, 2019) pushes design practitioners out of the realm of theoretical interventions into intentional action steps that can move our society closer to one that is more diverse, equitable, and inclusive. A localized context of use approach forces designers to focus on a narrow scope in terms of context (time/space), in terms of context of use (time/space and audience), and in terms of context of use approach (time/space, audience, and design team intentions.).

The field of instructional design is currently caught between calls to consider a broader societal context as an external influence on the learner when designing (Bradshaw, 2018) and calls for a narrow scope to systemic change, as the large scope of systemic issues arises not necessarily from the size of the systems themselves, but from the fact we have ingrained life within these imperfect systems in virtually every action we take (Tonkinwise, 2013). These processes do not have to exist in isolation but should work in tandem to shift the field away from hyperstandarization (Gouge, 2017). Critically reflecting and educating ourselves as designers on societal contexts experienced beyond our own scope should lead us to consider design as very personal, very localized, and very dependent not just on the audience of focus (Norman, 2013) but on the audience of focus within their specific context. This process of reflecting broadly to design narrowly is showcased in a case study of a graduate student's journey acting on a localized context of use approach to design intentional action and move the needle to a more diverse, equitable, and inclusive society in her organization.

The Assignment: Face a Given Circumstance via a Localized Context of Use Approach

In Week 3 of the summer 2020 *Non-instructional Interventions* graduate course, Kristin, the first author, posted the following to the course *Reflection Hub* in the days after the horrific death of George Floyd: "I've been struck by the call for instructional interventions in the news for both the police force and for our students. Comments like, 'Police just need to be trained better' and 'How are you going to address racism in the classroom?' would benefit (in my opinion) from maybe considering some non-instructional interventions." The post inspired the instructor (second author) to edit an Intervention Implementation Plan assignment where students design a performance improvement plan for a familiar for-profit or non-profit organization. Committing to diversity, equity, and inclusive excellence, the instructor altered the assignment to a localized context of use approach:

- Work alone or team up with no more than three peers,
- keep it small, keep it local, keep it within your circle of influence,
- reflect on how you design constructive action. How do you move the needle to a more diverse, equitable, and inclusive society in your neighborhood, organization, and/or city? (Not sure we want to go bigger than that),
- there may be an instructional element; however, it needs to be a background element and not a foreground element; and
- by week 4, post the context of your plan.

Prior to Kristin's post, the instructor was already critically reflecting on the events and dialogue surrounding George Floyd's death. From a performance improvement perspective, the instructor contends that instructional designers carry a tool kit that places them in a unique position to move the needle to a more diverse, equitable, and inclusive society in our circles of influence. Instructional designers are change agents (Campbell et al., 2009) who influence the shape of structures and processes both consciously and subconsciously (Herda, 1999). With Kristin's allusion to the instructional design field being equipped to answer some of the questions being raised in the wake of Floyd's death, the instructor saw an opportunity to share ways to leverage the instructional designer toolkit in the name of societal change. The intentional editing of this assignment was to forego any impression that instructional designers must remain neutral as well as to explore how a particular instructional design approach might lead to concrete social justice action. Providing an environment where design plans could move from the theoretical into the actual was of paramount importance.

In many ways, the assignment edits to focus on using a localized context of use approach to create a more diverse, equitable, or inclusive neighborhood or organization was, in itself, an example of this design approach in action. Adopted by healthcare (Bivens, 2019; Meloncon, 2017), a localized context of use approach emphasizes specific moments where context is scaled back to what is needed in a situation or moment (Baaki & Tracey, 2019). Meloncon (2017) suggests focusing

on various contexts of use; scaling back to a localized context allows for increased understanding and awareness of the specific audience of focus. The assignment edit responded to the increased understanding the instructor had of how current events uniquely situated this group of students to begin exploring how to design for societal improvement.

The collaborative *Reflection Hub* in Blackboard, an online environment used by the instructor and students for ongoing feedback, included answering the key design question: "What does it mean to design using a localized context of use approach?" Throughout the journey, the instructor stressed that context is about what information does in a setting or environment, not necessarily about what information is. During synchronous class sessions, students discussed how police force training was garnering national attention and whether or not those trainings were examples of design failures. For the instructor, the content of training is merely what information is. The instructor wanted students to reflect on what happens when designers fail to consider the moment of use of an intervention, whether training-based or non-instructional, and how this failure is what keeps systems from functioning equitably.

The "slow chat" asynchronous discussion facilitated via the *Reflection Hub* provided time for critical reflection on this new approach. Students were pushed to engage in critical dialogue on how the context of the moment in which an intervention was applied could drive the success or failure of said intervention. Students also critically reflected on how designer bias could sometimes blind a design team from fully grasping the context of the moment for all audiences. Only after students had reflected on the moment someone experiences inequity and acknowledged their own biases in considering these inequitable moments, could they begin designing interventions to move the needle to a more equitable neighborhood or organization. Table 1 represents key milestones during the eight-week project.

Table 1 Key milestones during the eight-week project

Week 5 & 6	In class: Discussed a localized context of use approach. In Reflection Hub: Students began a localized context of use approach by chipping away at layers: (a) identify the gap in results, (b) identify the audience of focus and relevant stakeholders, and (c) identify the specific moments of use. Students provided feedback to one another.
Week 7	**In class**: Discussed reframing the problem/opportunity. Moving from the old frame to the new frame, what directions have opened?
Week 8	**In class**: Deeper discussion regarding (a) identifying the gap in results, (b) identifying the audience of focus and relevant stakeholders, and (c) identifying the specific moments of use. Discussed the final design plan deliverable. **In reflection hub**: Students shared how they reframed the problem/opportunity and provided feedback to one another.
Week 9 & 10	**In reflection hub**: Students posted a design plan draft and received feedback from the instructor and other students.
Week 11	**In class**: Discussed remaining questions and points of clarity. Decided presentations would focus on; (a) the gap in results, (b) the audience of focus, (c) the non-instructional intervention(s) plan and (d) the plan rollout.
Week 12	In class: Each student/team presented the final design plan.

Kristin's Project: Alleviating Online Assessment Anxiety

The projects developed using a localized context of use approach were able to move beyond theoretically addressing issues of inequity. Instead, students created completed design plans ready for implementation within their own organizations and communities. This example follows the process of Kristin in designing and implementing a real-world solution for an instance of inequity within her organization.

Localized Context- Kristin's Moment

Automated proctoring softwares often utilize facial recognition software or facial detection software, products bound together by the umbrella term of facial processing technology (Raji et al., 2020). Within the education field, these technologies are ostensibly deployed in the name of student support (Bessette, 2020; Swauger, 2020), but, as in other fields, actual uses of facial processing technologies often blur the line between support and surveillance (Raji et al., 2020). In the switch to emergency remote educational methods due to the global COVID pandemic, automated proctoring usage increased at my mid-sized public university over 1000%.

An increased desire for technology vulnerable to abuse in the larger context of the pandemic suggested that perhaps professors trying to pivot to emergency remote modalities were untrained in principles of online assessment design. Several unrealistic solutions to this gap in performance surfaced, none appropriate to our specific use case. Larger universities suggested abolishing proctoring software and offering teacher assistants as proctors, but this is a workforce our university lacks. Comparable institutions suggested increased training in online assessment design; we agreed, but training takes time to develop, deliver, and evaluate. In the interim, we had to plan for at least one semester of increased automated proctoring usage across campus.

Early in this interim, students of color began self-reporting that it required multiple attempts with the facial detection software inherent in the online proctoring tool for them to be able to unlock an exam. This decreased functionality during the diagnostic portion of exams delayed students from accessing the content portion of exams, a delay that lighter-skinned classmates did not experience. Furthermore, such technological delays led to self-reported increases in test anxiety, a condition that 38.5% of all college students were already prone to experience (Kolski & Weible, 2018). Racial battle fatigue scholarship (Smith, 2004) paints an even bleaker picture for students of color where even high achieving students suffer from extreme environmental distress (Smith et al., 2011) leading to increased test anxiety and feelings of impostor phenomenon (Kumar & Jagacinski, 2006).

The inequitable context of the situation was clear, but in my rush to champion what I saw as a marginalized population, I forgot that designing with a localized context of use approach meant more than merely focusing on a local context. I became hyper focused on helping students navigate the software, failing to realize that the appropriate moment for an intervention could be long before students even access the proctoring platform.

Localized Context of Use- Kristin's Audience

Failing to reduce the scope of context suggests that all factors surrounding an audience have equal force and function (Meloncon, 2017). By contrast, a localized context of use allows designers to determine which factors have the most power and pull-on learners, and to design despite (or perhaps despite) these factors. While design objectives will not change, points of access to the audience will.

Unfortunately, I couldn't grasp this wisdom without several iterations of critical dialogue in the *Reflection Hub*. Early in the design process I was prompted:

> Here are two reflection suggestions. First, who is your audience? True, you may have more than one audience. Who are they? (Dr. Baaki)

Change for a specific audience is not always best achieved by leveraging an intervention that forces that audience to change. Considering a generic audience (i.e., students) outside of their numerous localized contexts reduces a designer's ability to fully design for specific use cases (St. Amant, 2017). While I acknowledged multiple stakeholders were invested in redesigning the inequitable experience inherent in our automated proctoring service, I could not see past the students as the audience of focus. Other classmates (names have been changed) tried to help:

> I wonder if you approached it through a different lens if it would help. Not, is the service biased? But the service is biased. Then the gap becomes, how do I design an intervention that reduces the bias for students. (Charline)

> I do completely agree that the students are the major stakeholders. But how does the university's stakeholder position come into play regarding contact period and terms, including rectifying software issues with the proctoring service provider? (Thomas)

I began designing a series of job aids to help students understand the proctoring service to which they would be subjected. Finally, a fellow designer reminded me:

> An improvement in the performance is necessary; not in terms of student performance but in terms of the conditions to which the faculty and instructional design staff are subjecting the students. (Elisa)

Creating a litany of proctored exam guidance—such as shining a light at exactly the correct angle from exactly the correct height—for students already affected in terms of learning environments flattens the unique experience of each student and suggests it is the student at fault for not being able to work within the environment of a poorly designed software. Refocusing where I narrowed context of use to examine how

faculty were selecting options within the proctoring system was necessary. Critical dialogue sparked a much-needed alternative approach.

Localized Context of Use Approach- Kristin's Designer Bias

Designers tend to be solution oriented (Tonkinwise, 2013). However, designing with a localized context of use approach requires continuous analysis of context, moment of use, and bias inherent in a designer's approach—all before designing a solution. I had narrowed the scope of my moment and reconsidered who was the audience of focus in that moment. A classmate reminded me to pause yet again:

> Now that you have presented a context, think about your gap in results. What is happening right now? What would be the desired situation? What is the cause of the gap? From there, you will be able to start designing solutions. (Thomas)

Rather than utilize a full-scale participatory design process, which cannot guarantee a design that fits each individual user in their unique context (Meloncon, 2017), a moment of change was leveraged at faculty. Those who wished to continue using proctoring services had to agree to certain restrictions within the system. Specific features, such as those that scan a student's testing environment, were prohibited. All proctored exams had to be offered in an exam window that was at least 1.25 times longer than the traditional face to face exam window. Wherever possible, practice proctored exams were to be provided so students would know exactly how long it might take them to access a graded exam. Kendi (2019) suggests that we should focus our efforts on confronting racist policy as opposed to racist action but doing so can leave individuals vulnerable in the interim. The intention of this design was to promote more equitable practices within an inequitable system. Simultaneously, I also engaged in work to abolish use of the system on my campus altogether, but that is beyond the scope of this chapter.

> I've always found personal reflection to be quite meaningful, but collaborative reflection was an element of this assignment that allowed me to grow as a designer. The intentional act of reflecting on the project coupled with the opportunity to engaged [sic] feedback with another peer was incredibly helpful. Often, I found I was struggling with items I didn't know until I viewed another reflection from a colleague. (Marcus)

The use of the *Reflection Hub* was key to developing a deep understanding of a localized context of use approach. Asynchronous critical dialogue can be seen as successful when individuals feel empowered to bring forth social change, using an active voice to address issues of social justice (Hilton, 2013). Without critical dialogue to help narrow context, change may never have moved from the design table into on-campus action. My hyper focus on students meant I was approaching a design opportunity as a savior figure rather than truly considering how to best serve my audience needs. Critical dialogue pushed me to a truly localized context of use approach, one that required me to sit with my bias and privilege so as not to inadvertently create a design that was merely theoretical or performative.

The semester that inspired this design wrapped up the first week of August; proctoring consultations with faculty were implemented by the third week of the same month. While this is certainly not the endpoint design for how my university interacts with automated proctoring service (indeed, the only endpoint can be an abolishment of that which is inherently inequitable), tangible action was taken for students stuck in the interim.

Designing for a Localized Context of Use

Wilkerson (2020) suggested a guiding question for our continued localized context of use approach to diversity, equity, and inclusion interventions: "The central question about human behavior is not why do those people do this or act in that way, now or in ages past, but what is it that human beings do when faced with a given circumstance?" (p. 387). How is it that designers should approach a localized context of use? Wilkerson provides the answer, through "radical empathy" (p. 386). Empathic design suggests that it is enough to try and imagine the feelings of your audience (Dandavate et al., 1996). Wilkerson (2018) suggests this practice leads us to presume how others experience the world. Radical empathy, by contrast, begins with reflection on our individual perspectives as part of the empathic design process, recognizing and attempting to set aside the privilege and bias we may subconsciously carry (Wilkerson, 2020). We must then engage in introspection, interaction, and intention (Thomas et al., 2002).

Introspection Engaging in introspection begins when we examine the context surrounding the specific moment of the intervention. We must narrow the focus to design learning for that specific moment of use, which allows us to identify the critical forces at work that can affect the understanding and use of instruction (Meloncon, 2017). We must put in the work to educate ourselves, connect and communicate with our audience on a deep and personal level, and determine the best approach to move forward. Kristin's project is proof positive that this introspection does not—and perhaps should not—need to be a solitary event; rather, engaging in critical reflection with a design team may be the only way to force a designer back from her inherent bias to consider moments of use that had previously gone unrecognized.

Interaction Beyond collaborative introspection with peers, interacting with our audience of use includes a co-determination of specific use cases. When we consider a specific moment of use, we reflect how our audience will use our design and the numerous ways our audience may then act. The moment of use may be a short moment (the time it takes to log onto a proctoring software platform) or a longer moment (the time it takes to abolish policies that threaten the ability of a campus to diversify). While Kristin interacted with each affected student during their self-reports of being denied access to the proctoring platform, she did not bring this

audience to the design table when trying to examine interim interventions. (If she had, it is possible that they would have led her to the revelation that she was focused on the wrong audience much sooner.) It's worth noting that this assignment has since been revised and now requires that designers work with the audience of use to collaboratively determine specific use cases early in the design process.

Intention The intention of our design must be to act. We may aim to design for greater equity and inclusion but will never move the needle towards a more equitable and inclusive society if we fail to take action. Kristin's case, although highlighting the continued use of an inherently inequitable software, is worth reflecting on because tangible change was brought to a specific moment of use. Had she failed to utilize a localized context of use approach, the scope of the design would never have narrowed, and students may have been left with another broad call for abolishing an inequitable practice that did not translate into actual change for their experiences. Taking action means determining the specific moment of use for our design and designing for that moment. Designing for a specific action case makes a design tangible instead of theoretical.

Implications for Design Education

Those engaged in the important work of educating future designers must be explicit about incorporating a localized context of use and radical empathy in the approaches taught to their students. Instructional design students tend to approach design models prescriptively (Stefaniak & Stapleton, 2021) more so than established designers in the field who allow a more organic process to take place (Demiral-Uzan, 2015). Additionally, established instructional designers have been found to embed their core values in design (Campbell et al., 2009; Stefaniak & Stapleton, 2021) which suggests, when modeling design processes, the explicit acknowledgement that instructional models are not neutral—and have never been so—is critical. Faculty engaged in design education must also acknowledge they, as designers, are not neutral, and may seek to engage in introspection and further critical reflection on how instructional design intersects within a broader social context. Cross's (2011) caveat to give the client what they do not know they need requires educators to engage in a level of introspection of their own—what do we not know that we need to help future cohorts apply principles of ID more equitably? Which principles of instructional design might need to be disrupted so as not to continue perpetuating injustice? In other words—Wilkerson's words, albeit paraphrased—what is it that, when faced with a specific moment of use, instructional designers do to create a design that is equitable? Introspection to recognize these core values and the intentional and explicit acknowledgement of the role they play in design is key when engaged in instructional design instruction.

A localized context of use approach does not simply mean empathy for the audience. As designers of change, we must engage in introspection, interaction, and

intention while reflecting on our own contexts and those of the given circumstances. And then, in answer to Wilkerson's call, we must act. We must put our change into action so that we move, iteration by interim design iteration, to a more equitable society for all.

References

Baaki, J., & Tracey, M. (2019). Weaving a localized context of use: What it means for instructional design. *Journal of Applied Instructional Design, 8*(1), 2–13.

Bessette, L. (2020). *Unfeeling AI and assessment*. Inside Higher Ed. Retrieved from https://www.insidehighered.com/blogs/university-venus/unfeeling-ai-and-assessment

Bivens, K. M. (2019). Reducing harm by designing discourse and digital tools for opioid users' contexts: The Chicago Recovery Alliance's community-based context of use and PwrdBy's technology- based context of use. *Communication Design Quarterly, 7*(2), 17–27.

Bradshaw, A. C. (2018). Reconsidering the instructional design and technology timeline through a lens of social justice. *Tech Trends, 62*(4), 336–344.

Campbell, K., Schwier, R. A., & Kenny, R. F. (2009). The critical, relational practice of instructional design in higher education: An emerging model of change agency. *Educational Technology Research and Development, 57*(5), 645–663.

Cochrane, S. V., Chhabra, M., Jones, M., & Spragg, D. (2017). *Culturally responsive teaching and reflection in higher education*. Routledge Focus.

Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Berg.

Dandavate, U., Sanders, E. B. -N., & Stuart, S. (1996). Emotions matter: User empathy in the product development process. In *Proceedings of the 40th annual meeting* of the *human factors and ergonomics society* (pp.415–418). HFES.

Demiral- Uzan, M. (2015). Instructional design students' design judgement in action. *Performance Improvement Quarterly, 28*(3), 7–23.

Gouge, C. C. (2017). Improving patient discharge communication. *Journal of Technical Writing and Communication, 47*(4), 419–439.

Herda, E. A. (1999). *Research conversations and narrative: A critical hermeneutic orientation in participatory inquiry*. Praeger.

Hilton, J. T. (2013). Digital critical dialogue: A process for implementing transformative discussion practices within online courses in higher education. *MERLOT Journal of Online Learning and Teaching, 9*(4), 602–614.

Kendi, I. X. (2019). *How to be an antiracist*. One World.

Kimmons, R. (2020). Current trends (and missing links) in educational technology research and practice. *Tech Trends, 64*(6), 803–809.

Kolski, T., & Weible, J. (2018). Examining the relationship between student test anxiety and webcam-based exam proctoring. *Online Journal of Distance Learning Administration, 21*(3), 1–15.

Kumar, S., & Jagacinski, C. M. (2006). Imposters have goals too: The imposter phenomenon and its relationship to achievement goal theory. *Personality and Individual Differences, 40*, 147–157.

Meloncon, L. K. (2017). Patient experience design: Expanding usability methodologies for healthcare. *Communication Design Quarterly, 5*(2), 20–28.

Norman, D. A. (2013). *The design of everyday things*. Doubleday.

Raji, I. D., Gerbu, T., Mitchell, M., Buolamwini, J., Lee, J., & Denton, E. (2020). Saving face: Investigating the ethical concerns of facial recognition auditing. *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society*, 145–151. https://doi.org/10.1145/3375627.3375820

Schunk, D. H. (1991). *Learning theories: An educational perspective*. Macmillan.

Smith, W. A. (2004). Black faculty coping with racial battle fatigue: The campus racial climate in a post-civil rights era. In D. Cleveland (Ed.), *A long way to go: Conversations about race by African-American faculty and graduate students at predominantly white institutions* (pp. 171–190). Peter Lang.

Smith, W. A., Hung, M., & Franklin, J. D. (2011). Racial battle fatigue and the miseducation of black men: Racial microaggressions, societal problems, and environmental stress. *The Journal of Negro Education, 80*, 63–82.

Sockman, B. R., Baker, F. W., III, Blevins, S. J., Aaron Bond, M., & Doucet Rand, A. (2020). Introduction to the September 2020 special issue: Harnessing systems thinking to inform meaningful change efforts in organizations. *Tech Trends, 64*(5), 682–683.

St. Amant, K. (2017). The cultural context of care in international communication design: A heuristic for addressing usability in international health and medical communication. *Communication Design Quarterly, 5*(2), 62–70.

Stefaniak, J., & Stapleton, L. (2021, November 2–6). *Exploring design judgements and management of problem space in instructional design* [Conference presentation]. AECT 2021 Convention.

Swauger, S. (2020). Our bodies encoded: Algorithmic test proctoring in higher education. *Hybrid Pedagogy: The Journal of Critical Digital Pedagogy*. Retrieved from https://hybridpedagogy.org/our-bodies-encoded-algorithmic-test-proctoring-in-higher-education/

Thomas, M., Mitchell, M., & Joseph, R. (2002). The third dimension of ADDIE: A cultural embrace. *Tech Trends, 46*, 40–45.

Tonkinwise, C. (2013). It's just going to be a lot of hard work: Four problematic and five potential ways of accomplishing radical sustainability innovation. *DRAFT*. Retrieved from https://uts.academia.edu/camerontonkinwise.

Wilkerson. I. (2018, May 27). *Middlebury college commencement address*. [Speech audio recording]. Class of 2018 Celebrates Commencement. https://vimeo.com/middmedia/review/272109425/5733544835?scrlybrkr=e95d4b1c

Wilkerson, I. (2020). *Caste: The origins of our discontents*. Random House.

A Systemic Approach Toward Needs Assessment to Promote Inclusive Learning Design

Jill E. Stefaniak and Kim Pinckney

In the wake of the many social justice discussions at present, the instructional design field must grapple with the same. While our work serves individual learners, teams, and organizations, we must consider whether we are designing for all. There continues to be a resounding push by scholars in the field that culture needs to be a central focus within and among learning design activities (Asino et al., 2017; Benson et al., 2017; Gunawardena et al., 2019; Subramony, 2019).

If the field of learning, design, and technology seeks to resolve societal shortcomings through inclusive learning design, it is important to recognize existing processes and infrastructure deficiencies. The focus of this chapter is to discuss the role that needs assessment can serve in the instructional design process to promote inclusivity. It is important to note that there are several existing challenges: (1) an absence of culture as a tenet in the instructional design process; (2) multiple interpretations of needs assessment as it relates to instructional design; and (3) a reliance on perfunctory instructional design models that fail to address systemic implications inherent in learning design (Stefaniak & Xu, 2020).

The overarching goal of this paper is to foreground the importance of inclusive needs assessment and analysis to mitigate social inequities in educational and learning environments. This chapter will explore instructional needs emerging from social injustices and inequities and introduce heuristics to guide educators and learning designers to integrate inclusive needs analysis strategies.

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Background

Recognizing that learning designers aim to design and develop a learning environment conducive to the needs of its learners, designers must have an accurate understanding of these needs and the environmental conditions under which students learn. While several social inequities have existed in education, many of these challenges have been magnified due to the recent global pandemic and spike in socio-political tensions. Examples of inequities that learning designers must be mindful of and address include access to technological resources, disruption of social support networks, underrepresentation of minorities in instructional examples, achievement gaps impacting minority and lower-income students, and insufficient infrastructural means to implement sustainable change in educational systems (Beaunoyer et al., 2020; Bradshaw, 2018; Mehta & Aguilera, 2020; Murrar et al., 2020; Stefaniak, 2021a). For learning interventions to endure, they must leverage needs assessments that explicitly examine these aspects of the organizational culture and infrastructure to ensure appropriateness and feasibility for the environment (Rogers, 2003).

Instructional design is an iterative and complex process that requires the instructional designer to continuously survey the needs of the learning environment, learners, and other constituents to design instructional solutions that are customized and sustainable. In its most simplistic form, instructional design can be broken down into analyzing, designing, developing, implementing, and evaluating phases (Cennamo & Kalk, 2019).

The purpose of a needs assessment in learning environments is to identify any discrepancies that may exist between the current learning environment and what is envisioned for the future (Altschuld & Kumar, 2010). While there are various definitions of *needs assessment*, it can be operationally defined as the data-driven search for opportunities to maximize individual, team, or organizational performance by contributing to the effectiveness, efficiency, and/or ease of supporting organizational goals (Pinckney-Lewis & Baaki, 2020). *Needs analysis* is an extension of needs assessment and further explores the factors contributing to any challenges or discrepancies that may exist in the current environment (Stefaniak, 2021b).

Challenges Inhibiting Inclusive Needs Assessment in Learning Design & Inconsistencies with Use of Needs Assessment Terminology

Needs assessment models exist across multiple domains, including instructional design, curriculum development, organizational development, and managerial planning (Ayers, 2011; Leigh et al., 2000). Because of this, specific terms may have differing denotations and are frequently misunderstood. Furthermore, some of the

terminology across those domains can be considered jargon, which can confuse the layperson and other professionals entrenched in other domains (Kornei, 2021). Understanding needs assessment and needs analysis related terminology influences how the needs assessment process is conceptualized and carried out (Leigh et al., 2000; Watkins & Kavale, 2014), when terminology is overly jargon-laced, it is less accessible to diverse populations and can also unintentionally exclude valuable stakeholders from participation (Pinckney-Lewis, 2021).

An Absence of Culture in the Instructional Design Process

The prevalence of culture as a construct in the instructional design process is one that is inferred but not explicitly stated. If we were to dissect existing instructional design models, we would find a generalized list of tasks that encapsulate ADDIE. If the field of learning, design, and technology seeks to work collectively to promote *inclusive design*, it is important to use common terminology to mitigate misconceptions.

For purposes of this chapter, we intentionally embrace Spencer-Oatey's (2008) definition:

> Culture is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures, and behavioral conventions that are shared by a group of people, and that influence (but do not determine) each member's behavior and his/her interpretations of the "meaning" of other people's behavior (p. 8).

This definition has guided scholarship in the field of learning, design, and technology (Asino et al., 2017; Benson et al., 2017; Sharif & Gisbert, 2015; Savard et al., 2020). Benson et al. (2017) note that this definition promotes inclusivity and flexibility with the term *fuzzy set* to account for the varying degrees to which an individual may subscribe to a particular culture.

While needs assessment is noted as being an important component of the instructional design process, it's often limited to learner analysis (Stefaniak & Sentz, 2020). In the rare occasions that a needs assessment is included in an instructional design process, it is viewed as a one-time occurrence before an instructional designer engages in design. Researchers who study performance improvement as it pertains to instructional design argue that needs assessment and analysis, like design, follows an iterative process throughout the entire project (Asino et al., 2017; Peters & Giacumo, 2020; Pinckney-Lewis, 2021; Pinckney-Lewis & Baaki, 2020; Stefaniak, 2021b). If the learning, design, and technology field seeks to promote more inclusive learning environments, further attention is warranted for how: (a) we address needs assessment to capture the needs of our learners; (b) we understand the complexities of the learning system, and (c) culture is explicitly addressed within this systemic approach to learning design.

Gunawardena et al. (2019) contend that "cultures persist by way of interaction" (p. 3). These interactions, both informal and formal, help us determine the degree to

which we belong, agree, or contribute to a particular culture. The idea that culture persists through interaction acknowledges that several components interact with one another within a given system. Acknowledging interactions that contribute to an existing culture embodies the fundamental characteristics of a system in which objects interact with one another and their attributes working towards a goal (Hall & Fagen, 1975).

If we are to embrace culture as a prominent construct in learning design, it is imperative that we recognize the ongoing influence that interactions between members of a community may pose to a learning environment. If a culture is representative of systems characteristics, designing environments that are inclusive of cultural needs warrants a systemic approach to instructional design. This would call for a re-evaluation of how many learning designers refer to and integrate needs assessment into their design practices.

If we are to embrace culture as a prominent construct in learning design, it is imperative that we promote a systemic approach to instructional design. Seminal works discussing the role of context in instructional design recommend that there needs to be congruence between orienting, instructional, and transfer sub-contexts (Tessmer & Richey, 1997). While learners' predispositions are listed as a component of the orienting context, there is a paucity of recommendations to promote an inclusive learning environment that meets learners' specific needs. Rather, context is woven into the prescriptive nature of many instructional design models that suggests the designer will determine what is best for the learners. We argue that context can be leveraged to inform designers of their learners' needs and provide an opportunity for learners to be active participants in the construction of their learning environments.

Lack of Focus on the Human Element

One of the criticisms of needs assessment is that they can sometimes lack humanism by not accounting for multiple ways of knowing. For example, some needs assessment practitioners lean heavily on quantitative data collection (e.g., Likert-scale responses) (Witkin, 1994). Though self-reported, these methods are "not humanistic and [do] not get to the subtleties of the human condition" which are often better understood through qualitative approaches (Altschuld & Watkins, 2014, p. 9). Some survey data collection approaches lack empathy for the lived experiences of the various individuals and organizations of study (Pinckney-Lewis, 2021).

Humanism assumes that all individuals have personal autonomy and can influence social progress (Pearson & Podeschi, 1999). Specifically, humanistic approaches value the individuals' ability to evaluate themselves through self-observation or other analysis (Thorndike & Thorndike-Christ, 2010). When taking a humanistic and systemic view, all those who contribute to and play a role in the organizational context are valued. To truly be inclusive in this work, there is no one-size-fits-all approach to data collection. As practitioners, we must actively seek out,

accommodate, and value the true breadth of constituents within the needs assessment process, especially those from marginalized or overlooked populations.

Finally, keeping the human element in mind allows for an empathic approach (Pande & Bharathi, 2020) or putting oneself in the "shoes" of the learners (Landwehr, 2007). Intentional attention placed on an empathetic approach to instructional design (Goodyear & Ellis, 2008; Lawrence, 2020; Matthews et al., 2017; Tracey & Hutchinson, 2019) suggests that the learners should be at the forefront of all design activity from the conception of a project to implementation. In fact, design thinking approaches often begin with empathy (Jian-hua, 2008; Matthews et al., 2017; Pande & Bharathi, 2020). Within the empathy phase of design thinking, learner analysis, needs assessment, and persona development are frequently practiced to deeply understand who the learner or end-user is. By taking an empathic approach, learning designers can identify the contextually embedded constraints within the system that affect performance at the individual, team, or organizational level. When needs assessment models fail to prioritize empathizing with the stakeholders, learners, and other end users of the eventual interventions, they miss out on the opportunity to identify and design for the full essence and representation of these individuals. In fact, taking an empathic approach to needs assessment can even lead to favorable participant experiences, including an increased willingness of clients to engage or provide access to data, stakeholders reporting favorable interactions with the needs assessment facilitator, and enjoyment of the process (Pinckney-Lewis & Baaki, 2020).

Failure to Address Systemic Implications Inherent in Learning Design

A criticism has been that the instructional design models that are used to teach instructional design suggest that it follows a linear approach (Gibbons, 2014; Pinckney-Lewis, 2021; Smith & Boling, 2009; Stefaniak & Xu, 2020). Instructional design is often described as a systematic process in which the designer gathers information at various stages of the project to progress with designing instruction. However, there is a lack of explicit language, guidance, or heuristics that address the systemic nature of instructional design. A systemic approach to design considers all components of the design environment (system) and the relationship among each of these components (Gibbons, 2014; Richey et al., 2011; Stefaniak & Xu, 2020). Taking a systemic approach to instructional design would result in various activities that occur during the design process and duration of the project to drive other design activities; thus, strengthening the alignment between components of the system. The inability to design with systemic considerations in mind is problematic to instructional design. The argument that many instructional design models do not address the systemic nature of the learning and design environment is further supported by the inconsistent and inaccurate depiction of how analysis is referred to

in these processes. What is further problematic is that many of these models imply a paternalistic approach to instructional design where the instructional designer conducts a learner analysis, chooses what information is included, and assesses whether the learners' needs are worth addressing. The notion of inclusivity of design is not inherent in these models. This is problematic because instructional design can be leveraged to effect change of the inherent characteristics of the system in an effort to address social justice and inequity in and outside of the system.

If a needs assessment does not accurately reflect the learning environment and all the components that comprise that system, the instructional designer will be unable to design an instructional solution that portrays the needs and voices of their learners (Asino et al., 2017). Sanchéz (2019) has recommended that a specific focus on sociocultural contexts and diversity is needed to "guide the methods and questions that inform a needs assessment to empower and liberate learners" (p. 198). Failure to address this is a direct undercut to the learner's needs and can continue to perpetuate existing inequities.

Discrepancies Between Perceived Solutions and Data-Driven Recommendations

One of the arguments within needs assessment deals with the outcomes and recommendations that emerge from the process. For example, humanistic approaches value the inclusion of multiple, diverse voices in the process, which should yield diverse responses and feedback within the data. Multiple perspectives and ways of experiencing may contribute to discrepancies across what participants and stakeholders perceive as the need(s). The degree to which these discrepancies exist can impact perceptions of burden in terms of implementing the recommendations (Pinckney-Lewis, 2021).

Another example of how discrepancies can arise within the needs assessment process is when clients and stakeholders have their own preconceived notions of what the needs and solutions are. Rightfully so, the perceived needs of the client and stakeholder deserve to be met. However, the needs assessment process will often unearth gaps that extend beyond those perceived needs. When the results from an objective needs assessment clash with preconceived notions, cognitive dissonance ensues (Kaufman, 1977; Kaufman & Guerra-Lopez, 2013). Reconciling discrepancies between perceived solutions and data-driven recommendations can be difficult. Carefully and respectfully navigating through this process can prove challenging, even for experienced needs assessment facilitators, clients, and stakeholders.

Strategies to Enable Inclusive Design

To enhance learning designers' abilities to engage in inclusive instructional design practices, the following heuristics are provided to support the activities they may undertake while conducting a needs assessment. These heuristics are not meant to substitute existing needs assessment models; rather, they are intended to be integrated into activities associated with identifying learner needs, conducting data collection and analysis to validate identified needs, and make recommendations that promote inclusive learning experiences.

Learning Designers Should Limit the Use of Technical Jargon and Define Related Terminology in Simple Terms The use of jargon unintentionally serves as a tool of exclusion by adding a heightened perception of technicality and rigor than is intended. Using plain, familiar language will help increase participation and overall buy-in into the assessment and design process (Pinckney-Lewis, 2021; Zemke, 1998). It will also serve to make the process accessible for data providers, clients, and stakeholders.

Learning Designers Should Intentionally Engage in Triangulated Data Collection Within the Needs Assessment and Analysis Processes to Ensure the Inclusion of Constituents Representing the Intended Population *Triangulation*, or the inclusion of multiple data sources, is a widely accepted best practice across qualitative, quantitative, and mixed methods research (Creswell & Creswell, 2013; Lincoln & Guba, 1985). Within a needs assessment, triangulation allows for multi-dimensionality, such that instructional designers can examine needs through various lenses (Pinckney-Lewis, 2021) and take a systemic approach (Altschuld & Kumar, 2010; Leigh et al., 2000; von Bertalanffy, 1972). Beyond just including multiple data sources to merely check a box, triangulation should be viewed as a mechanism to intentionally include diverse voices within the process and ultimately increases the applicability and appropriateness of design solutions for the environment (Rogers, 2003). Being explicit about having diverse voices from the population also speaks to the globalized perspective and cultural sensitivity needs assessment should take (Pinckney-Lewis, 2021; Watkins & Altschuld, 2014).

Learning Designers Should Take an Empathic Approach to Needs Assessment and Analysis Because of the dual technical and artistic nature of needs assessment (Altschuld & Kumar, 2010), practitioners must possess a mixture of technical and interpersonal skills. Being able to take an empathic approach or placing yourself in the figurative shoes of the target population helps to get closer to the lived experience of the participants (Kouprie & Visser, 2009; Landwehr, 2007; Pinckney-Lewis, 2021). Therefore, empathy is essential to inclusive needs assessment and analysis because it will help create a welcoming, accessible, and pleasant learning environment (Pinckney-Lewis & Baaki, 2020).

Learning Designers Should Ask Questions That Provide Details Regarding the Infrastructure Needed to Support the Learning Environment While learning designers must ask questions that will inform the instructional content to be included in their activities, it is of equal importance for them to ensure they obtain adequate information regarding the infrastructure needed to support the instructional activities and support long-term changes to improve organizational outcomes. This can be accomplished by identifying what non-instructional interventions currently exist to support the learning environment and additional interventions that may be needed to promote inclusivity. Examples of non-instructional interventions include, but are not limited to, communication plans and systems, electronic performance support systems, just-in-time support, knowledge management, human resources development, and work design (Stefaniak, 2021b). Often, instructional solutions need to be accompanied by non-instructional interventions to support implementation. Non-instructional interventions provide the infrastructure needed for the instructional experience to be implemented as intended.

Questions Asked During Needs Assessment Should Extend Beyond Instructional Activities to Include Where and How They Will Apply Instruction Learners are more apt to transfer what they have learned to real-world environments when they are provided with contextualized examples that depict the realities of their environment. Ensuring that appropriate infrastructure is critical when seeking to design inclusive environments. Learning designers should not make assumptions that all learners will be learning within the same environmental conditions. To provide flexibility and consider learners' environments, instructional design practitioners should ask questions that provide details regarding the infrastructure needed to support the learning environment.

Learning Designers Should Prioritize Needs in a Collaborative Process with Stakeholders While the needs assessment process may unearth multiple needs or gaps in performance, not all needs can be addressed automatically. Constraints due to lack of resources, infrastructure, and governing policies often inhibit the individual, team, or organization's agency in addressing needs assessment recommendations. When learning designers collaborate with stakeholders to prioritize needs, they can work through any discrepancies in perceptions and recommendations that emerged or resulted in cognitive dissonance. Working through these discrepancies often results in a heightened state of arousal that can foster adaptive behavior, a sense of teamwork, and joint accomplishment (Cooley et al., 2015). By extension, the team can then develop a feasible and appropriate action plan to address those prioritized needs for their organizational context. Additionally, from a social justice perspective, the needs assessment findings can arm stakeholders with useful data to advocate for additional resources, enhancements to infrastructure, and/or changes to governing policies that hinder optimal performance outcomes.

Conclusion

Needs assessment and analysis provide the means to obtain a detailed view of the systemic relationships that may exist within an organization and learning environment (Stefaniak, 2021b). By structuring needs assessment activities to address the challenges outlined in this chapter, learning designers will be able to design and cultivate inclusive learning environments. Prescribing the idea that analysis of the instructional design process should expand beyond basic demographic information collected about the learning audience will enable learning designers to gather a much richer understanding of the inner workings of the environment, thus supporting their efforts to customize their instruction to meet the needs of their learners while promoting equity and access.

References

Altschuld, J. W., & Kumar, D. D. (2010). *Needs assessment: An overview*. SAGE.

Altschuld, J. W., & Watkins, R. (2014). A primer on needs assessment: More than 40 years of research and practice. *New Directions for Evaluation, 2014*(144), 5–18. https://doi.org/10.1002/ev.20099

Asino, T. I., Giacumo, L. A., & Chen, V. (2017). Culture as a design "next": Theoretical frameworks to guide new design, development, and research of learning environments. *The Design Journal, 20*(sup1), S875–S885. https://doi.org/10.1080/14606925.2017.1353033

Ayers, D. F. (2011). A critical realist orientation to learner needs. *Adult Education Quarterly, 61*(4), 341–357. https://doi.org/10.1177/0741713610392769

Beaunoyer, E., Dupéré, S., & Guitton, M. J. (2020). COVID-19 and digital inequalities: Reciprocal impacts and mitigation strategies. *Computers in Human Behavior, 111*, 106424. https://doi.org/10.1016/j.chb.2020.106424

Benson, A. D., Joseph, R., & Moore, J. L. (2017). Introduction to culture, learning, and technology: Research and practice. In A. D. Benson, R. Joseph, & J. L. Moore (Eds.), *Culture, learning, and technology: Research and Practice* (pp. 1–7). Routledge.

Bradshaw, A. C. (2018). Reconsidering the instructional design and technology timeline through a lens of social justice. *TechTrends, 62*(4), 336–344. https://doi.org/10.1007/s11528-018-0269-6

Cennamo, K., & Kalk, D. (2019). *Real world instructional design: An iterative approach to designing learning experiences* (2nd ed.). Routledge.

Cooley, S. J., Burns, V. E., & Cumming, J. (2015). The role of outdoor adventure education in facilitating groupwork in higher education. *Higher Education, 69*(4), 567–582. https://doi.org/10.1007/s10734-014-9791-4

Creswell, J., & Creswell, D. (2013). *Qualitative, quantitative, and mixed methods approaches in research design* (5th ed.). Sage Publications.

Gibbons, A. S. (2014). Eight views of instructional design and what they should mean to instructional designers. In B. Hokanson & A. S. Gibbons (Eds.), *Design in educational technology* (pp. 15–36). Springer.

Goodyear, P., & Ellis, R. A. (2008). University students' approaches to learning: Rethinking the place of technology. *Distance Education, 29*(2), 141–152. https://doi.org/10.1080/01587910802154947

Gunawardena, C. N., Frechette, C., & Layne, L. (2019). *Culturally inclusive instructional design: A framework and guide for building online wisdom communities*. Routledge.

Hall, A. D., & Fagen, R. E. (1975). Definition of system. In B. D. Ruben & J. Y. Kin (Eds.), *General systems theory and human communication* (pp. 52–65). Hayden Book Company.

Jian-hua, L. (2008). An investigative analysis of the current situation of empathy in interactive classroom teaching. *Journal of Liaoning Normal University (Social Science Edition), 4*, 017.

Kaufman, R. (1977). Needs assessment: Internal and external. *Journal of Instructional Development, 1*(1), 5–8. https://doi.org/10.1007/BF02904307

Kaufman, R., & Guerra-Lopez, I. (2013). *Needs assessment for organizational success*. ASTD Press.

Kornei, K. (2021, April 9). Are you confused by scientific jargon? So are scientists. *New York Times*, 9–10. https://www.nytimes.com/2021/04/09/science/science-jargon-caves.html

Kouprie, M., & Visser, F. S. (2009). A framework for empathy in design: Stepping into and out of the user's life. *Journal of Engineering Design, 20*(5), 437–448. https://doi.org/10.1080/09544820902875033

Landwehr, P. (2007). *Empathic design vs. empathetic design: A history of confusion*. Dataprivacylab. Org. https://dataprivacylab.org/dataprivacy/projects/dialectics/designmethods/plandweh.pdf

Lawrence, A. (2020). Teaching as dialogue: An emerging model of culturally responsive online pedagogy. *Journal of Online Learning Research, 6*(1), 5–33.

Leigh, D., Watkins, R., Platt, W. A., & Kaufman, R. (2000). Alternate models of needs assessment: Selecting the right one for your organization. *Human Resource Development Quarterly, 11*(1), 87–93.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 9, pp. 438–439). Sage.

Matthews, M., Williams, G., Yanchar, S., & McDonald, J. (2017). Empathy in distance learning design practice. *TechTrends, 61*, 486–493. https://doi.org/10.1007/s11528-017-0212-2

Mehta, R., & Aguilera, E. (2020). A critical approach to humanizing pedagogies in online teaching and learning. *The International Journal of Information and Learning Technology, 37*(3), 109–120. https://doi.org/10.1108/IJILT-10-2019-0099

Murrar, S., Campbell, M. R., & Brauer, M. (2020). Exposure to peers' pro-diversity attitudes increases inclusion and reduces the achievement gap. *Nature Human Behaviour, 4*(9), 889–897. https://doi.org/10.1038/s41562-020-0899-5

Pande, M., & Bharathi, S. V. (2020). Theoretical foundations of design thinking – A constructivism learning approach to design thinking. *Thinking Skills and Creativity, 36*(February), 100637. https://doi.org/10.1016/j.tsc.2020.100637

Pearson, E. M., & Podeschi, R. L. (1999). Humanism and individualism: Maslow and his critics. *Adult Education Quarterly, 50*(1), 41–55.

Peters, D. J. T., & Giacumo, L. A. (2020). Ethical and responsible cross-cultural interviewing: Theory to practice guidance for human performance and workplace learning professionals. *Performance Improvement, 59*(1), 26–34. https://doi.org/10.1002/pfi.21906

Pinckney-Lewis, K. (2021). *Perceptions of burden in needs assessment: An exploration of measurement creation and validation*. Old Dominion University. https://doi.org/10.25777/9qdn-fh09

Pinckney-Lewis, K., & Baaki, J. (2020). Insider effects: Empathy in needs assessment practice. In J. Stefaniak (Ed.), *Cases on learning design and human performance technology* (pp. 142–162). IGI Global. https://doi.org/10.4018/978-1-7998-0054-5

Richey, R. C., Klein, J. D., & Tracey, M. W. (2011). *The instructional design knowledge base: Theory, research, and practice*. Routledge.

Rogers, E. (2003). *Diffusion of innovations*. Free Press.

Sanchéz, D. (2019). Needs assessment and infrastructure analysis. In C. N. Gunawardena, C. Frechette, & L. Layne (Eds.), *Culturally inclusive instructional design: A framework and guide for building online wisdom communities* (pp. 197–214). Routledge.

Savard, I., Bourdeau, J., & Paquette, G. (2020). Considering cultural variables in the instructional design process: A knowledge-based advisor system. *Computers & Education, 145*, 103722. https://doi.org/10.1016/j.compedu.2019.103722

Sharif, A., & Gisbert, M. (2015). The impact of culture on instructional design and quality. *International Journal of Instruction, 8*(1), 143–156.

Smith, K. M., & Boling, E. (2009). What do we make of design? Design as a concept in educational technology. *Educational Technology*, 3–17.

Spencer-Oatey, H. (2008). *Culturally-speaking: Culture, communication, and politeness theory* (2nd ed.). Bloomsbury Publishing.

Stefaniak, J. (2021a). Policy and contextual considerations for enabling learning support roles in digital environments. *Educational Technology Research and Development, 69*(1), 221–225. https://doi.org/10.1007/s11423-020-09853-7

Stefaniak, J. (2021b). *Needs assessment for learning and performance: Theory, process, and practice*. Routledge.

Stefaniak, J., & Sentz, J. (2020). The role of needs assessment to validate contextual factors related to user experience design practices. In M. Schmidt, A. A. Tawfik, I. Jahnke, & Y. Earnshaw (Eds.), *Learner and user experience research: An introduction for the field of learning design & technology*. EdTech Books. https://edtechbooks.org/ux/role_of_needs_assessment

Stefaniak, J., & Xu, M. (2020). An examination of the systemic reach of instructional design models: A systematic review. *TechTrends, 64*(5), 710–719. https://doi.org/10.1007/s11528-020-00539-8

Subramony, D. P. (2019). Revisiting instructional technologists' inattention to issues of cultural diversity among stakeholders. In A. D. Benson, R. Joseph, & J. L. Moore (Eds.), *Culture, learning, and technology: Research and practice* (pp. 28–43). Routledge.

Tessmer, M., & Richey, R. C. (1997). The role of context in learning and instructional design. *Educational Technology Research and Development, 45*(2), 85–115. https://doi.org/10.1007/BF02299526

Thorndike, R. M., & Thorndike-Christ, T. (2010). Qualities desired in any measurement procedure: Validity. In J. W. Johnston (Ed.), *Measurement and evaluation in psychology and education* (pp. 154–199). Pearson.

Tracey, M. W., & Hutchinson, A. (2019). Empathic design: Imagining the cognitive and emotional learner experience. *Educational Technology Research and Development, 67*(5), 1259–1272. https://doi.org/10.1007/s11423-019-09683-2

von Bertalanffy, L. (1972). The history and status of general systems theory. *The Academy of Management Journal, 15*(4), 407–426. https://www.jstor.org/stable/255139

Watkins, R., & Altschuld, J. W. (2014). A final note about improving needs assessment research and practice. *New Directions for Evaluation, 2014*(144), 105–114. https://doi.org/10.1002/ev.20106

Watkins, R., & Kavale, J. (2014). Needs: Defining what you are assessing. *New Directions for Evaluation, 2014*(144), 19–31. https://doi.org/10.1002/ev.20100

Witkin, B. R. (1994). Needs assessment since 1981: The state of the practice. *Evaluation Practice, 15*(1), 17–27.

Zemke, R. (1998). How to do a needs assessment when you think you don't have time. *Training, 35*(3), 38–44.

Adapting a Neuroscience High School Curriculum to Support Inclusive Online Learning

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Neuroscience is one of the most rapidly growing STEM fields, with increasing presence in public media and potentially important implications to everyday life (e.g., education, medicine, and law; O'Connor et al., 2012; Sperduti et al., 2012). However, brain science is not typically incorporated into K-12 science education, and students' basic knowledge about the brain remains fragmentary (Sperduti et al., 2012). To address this need, with support from the National Institute of General Medical Sciences' Science Education Partnership Award, our team has developed *BrainWaves*, a semester-long neuroscience high-school curriculum. Over the past 4 years, the *BrainWaves* program reached over 600 students in underserved New York City (NYC) public high schools. 73% of the students in *BrainWaves* are from racial and ethnical groups that are traditionally underrepresented in STEM.

Most participating schools implement the program as a science elective course that meets daily. Students spend the first half of the semester exploring neurons,

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brain anatomy, and human memory through a sequence of hands-on activities and laboratories (e.g., a sheep brain dissection). The second half of the semester is devoted to small-group, student-led investigations, where students develop a research question, collect and analyze data (e.g., how listening to music affects concentration). Throughout this process, students use a dedicated app (the *BrainWaves* app), preloaded with cognitive tasks that students incorporate in their investigations. Critically, each participating teacher is paired with a science mentor, typically a doctoral student or a postdoctoral fellow in neuroscience. The scientists visit the schools once a week to support the implementation of the program and mentor students in their research projects. The program culminates at a symposium, where all participating students gather to share the results of their research projects (Azeka et al., 2020).

Adapting Curriculum to Online Formats Due to COVID-19

The outbreak of COVID-19 forced many schools and institutions to temporarily close or to shift entire curricula and programs online. This sudden shift led to an unprecedented challenge where educators were required to rapidly transition face-to-face instruction to remote learning formats and virtual classrooms (Neuwirth et al., 2020). While many institutions typically provide support personnel and instructional design teams to assist with such efforts, these teams tend to work on a case-by-case basis and as a result were ill-equipped to handle the tremendous need for support in such an expedited fashion (Hodges et al., 2020). In fact, a typical online course can take anywhere from 6 to 9 months to fully plan, prepare, and develop (Hodges et al., 2020) and teachers could not suddenly become experts in teaching and designing online curriculum in only a few short days or weeks. Due to these constraints, many educational programs struggled with developing solutions to help learners during this pandemic (Liguori & Winkler, 2020).

The challenge of adapting face-to-face curricula to online learning in such a short amount of time was further amplified due to the many factors that should be considered in this process, including accessibility, flexibility, learning pedagogy, distance, and authenticity (Dhawan, 2020). Related to this challenge is that there are a number of information and communications technologies that have become available to support online learning. The abundance of readily available technologies has made it easier than ever to quickly bring instruction online. However, it has also created new and emerging challenges of adoption that often go undocumented in the literature.

These challenges include pragmatic difficulties with downloading software, installation on a wide range of devices and networks, login problems, audio-visual quality, cost, accessibility, and support. There are also challenges with combatting technology fatigue (like that seen with Zoom and other teleconference technologies during the pandemic) as there is a dearth of research that has examined the psychological consequences of using the same medium day after day for many

hours (Bailenson, 2021), which has ramifications on student engagement and satisfaction (Asgari et al., 2021) .

Of importance is the challenge of designing a curriculum that implements technology capable of mediating learning experiences that are authentic. This problem was particularly pronounced for lab-based curriculum (e.g., our neuroscience program) and other hands-on programs during the pandemic (e.g., Bergsman & Chudler, 2021; Johnson & Barr, 2021) as readily available and accessible technological solutions often do not provide the affordances necessary for delivering such instruction. As a result, online learning tends to be overly theoretical, didactic, and repetitive with artificial notions of student discourse and engagement (Song et al., 2004).

Challenge Statement & Positionality

Like the majority of education programs, the *BrainWaves* team struggled with deciding whether to cancel or adapt the curriculum while not knowing how the pandemic would impact state and local policies for the next school year (Bergsman & Chudler, 2021). In the process of adapting this curriculum to online instruction due to the pandemic, we encountered several challenges.

First, many hands-on learning activities in the curriculum do not immediately translate to an online environment (e.g., recording electrical impulses from insects). Second, we were concerned about the effectiveness of small group student-led investigations in online environments, where student interactions as well as teacher and mentor support might be more limited. Third and finally, any technological solutions implemented needed to be readily accessible and to work on a variety of student-owned devices.

We make a point to intentionally contrast and separate our project from that of traditional online learning and instead align this transition with emergency remote teaching Hodges et al., 2020. This position is taken because the *BrainWaves* curriculum was not originally conceived as being an online learning experience and was simply placed online as a temporary shift during a crisis. The primary objective of our emergency remote teaching response was not to fully re-create the *BrainWaves* curriculum into a robust educational ecosystem, but instead was to provide temporary access and instructional support that would be reliable and readily available to students and teachers across multiple schools and districts. Due to the expediency of which we were required to make the transition to emergency remote teaching, instructional design and curricula decisions were often based on pragmatic considerations such as past experiences, ease of access, and cost. The experiences of teachers and mentors were used to inform these decisions through ongoing and iterative professional development and training sessions.

It is therefore the purpose of this case study to describe how curriculum developers partnered with teachers and science mentors to rapidly deploy an emergency remote teaching version of the *BrainWaves* program. By providing a description of

this case, we hope that others in the field will be able to extrapolate lessons learned from our process as to apply solutions to their own curricula challenges. The following sections detail our experiences in the form of an instrumental case study.

Case Study

The lessons presented in this case study are intended to inform others in the field as they grapple with their own design and development challenges in adapting curriculum from face-to-face to online formats. These lessons are presented as instrumental case study where we seek to provide insight into an issue (Stake, 1995). Our focus was a substantial research-to-practice gap concerning how designers can adapt lab-based curriculum that can: (1) be delivered remotely and be accessed by students in their homes, (2) allow for a collaboration between students, teachers, and science mentors, (3) provide authentic inquiry-based learning opportunities, and (4) allow for flexibility and inclusiveness such as considering the digital divide to ensure all content can be accessed on a wide range of devices to fit the needs of students. To address our overarching purpose of this case study we present two research questions: (1) What were the challenges associated with adaptation of a face-to-face science curriculum to an inclusive online environment? (2) How did the digital tools used in the online curriculum provide accessibility and foster an inclusive learning environment?

Site and Key Participants

Since March 2020, our team has met weekly to adapt the face-to-face curriculum to an online format. The team consisted of a faculty member and two curriculum specialists with a background in cognitive neuroscience, a postdoctoral researcher with a background in instructional design and technology, two experienced high school science teachers who taught the program face-to-face, and a neuroscientist who had previously served as a mentor in the program. The fully-developed online curriculum has been implemented in two public NYC high schools in Fall 2020.

Data Collection and Analysis

Data are presented from the perspectives of the *BrainWaves* curriculum team. Experiences and case narratives were compiled through the use of autoethnographic methods (Bruner, 1993; Freeman, 2004) upon the completion of the 2020–2021 *BrainWaves* program. As we went through the autoethnographic process we referenced project artifacts to assist with the recall (Goodall, 2001) of our instructional

design process. These project artifacts included training materials, meeting minutes, emails and digital communications, prototypes, lesson plans, and project documentation. As a part of our process we sought to identify lesson plans and curriculum narratives that could best emphasize our process of adapting our lab-based curriculum to an emergency remote teaching experience.

The Case

Our adaptation process from the face-to-face curriculum to the emergency remote teaching curriculum was guided by a three phase iterative instructional design process including: (1) Preparation, (2) Design and Development, and (3) Formative Evaluation (see Fig. 1). The Preparation phase of the adaptation process began with a review of the face-to-face curriculum. A member of the curriculum team was assigned to each of the lesson plans to begin the process of converting them for emergency remote teaching. Each lesson was reviewed with a teacher or a science mentor who examined the lesson's learning objectives and worked to refine them given the transition online and the limitations imposed. They were also able to provide details about their school policies concerning technology and student access. These conversations were ongoing and reflexive and led to the articulation and refinement of learning objectives for an inclusive online curriculum that emphasizes authentic inquiry-based learning.

Once we had established our design decisions we moved into Phase 2 (Design and Development). In this phase we rapidly designed instruction based on a variety of considerations, including our personal experiences, school policies, technological considerations, and social considerations. As part of this process we tested multiple

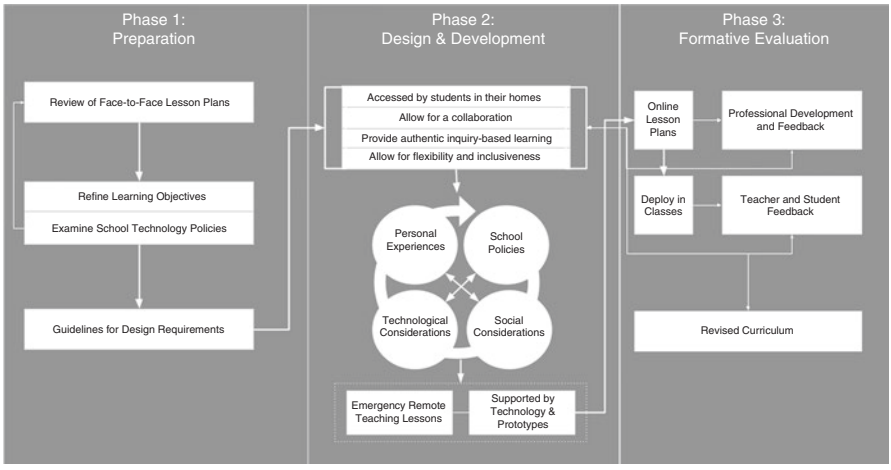

Fig. 1 Three-phase curriculum adaptation process

technological platforms that could be used to engage students in online learning while trying to align these decisions with our design requirements. Since one of our adaptation goals was to be sensitive to supporting inclusive online learning that considered the digital divide of our students, we considered the purpose, interactivity, and accessibility features of each technological solution. Due to the variability in student needs, communities, and schools across institutions, we based many of our design decisions on the personal experiences of the curriculum team as to what worked best for them in the past or on other projects. By the end of Phase 2 we had drafts of our emergency remote teaching lessons and supporting technology prototypes.

In Phase 3 (Formative Evaluation), a new cohort of teachers participated in a week-long summer professional development session with additional just-in-time sessions throughout the school year (all sessions were conducted virtually). Teachers were organized into breakout rooms to discuss the newly adapted lesson plans and to evaluate their feasibility within their specific schools. Feedback was elicited throughout the implementation of the program via weekly teacher and mentor logs concerning the inclusiveness of the approach for their students and the alignment of the curriculum with the desired design principles. At various stages of the process members from the *BrainWaves* team attended virtual class sessions to obtain student and teacher feedback on lesson activities. Since the *BrainWaves* curriculum was implemented across classrooms at different paces through the semester, an iterative approach to formative design and evaluation was conducted. Feedback used from one classroom would inform revisions to the lesson plans for future classrooms.

While our adaptation model has been presented as a three-phase process, the complexity and iterative nature of our process can be hard to accurately visualize and articulate. To demonstrate our adaptation process we will now provide a rich narrative of the process and the output of two sample lessons to bring to light how our team of instructional designers, curriculum designers, mentors, and science teachers addressed emergent challenges.

Lesson 3.2: How Do We Learn and Remember?

The goal of this lesson was to expose students to activities related to how they learn and remember. The first activity focuses on evaluating students' short-term memory. In this activity, students are asked to recall as many words as they can from a list of 20 words presented by the teacher. After writing down all the words they can recall, the teacher makes a graph on the whiteboard depicting how many students recalled each word in the list. Teachers then debrief students with questions about why this task might be challenging or easy and introduce the concepts of primacy and recency effects (our tendency to better recall words from the beginning or end of the list, respectively).

To adapt this activity for our online curriculum we provided teachers with a couple of ways of delivering the instruction. Most schools that we partnered with

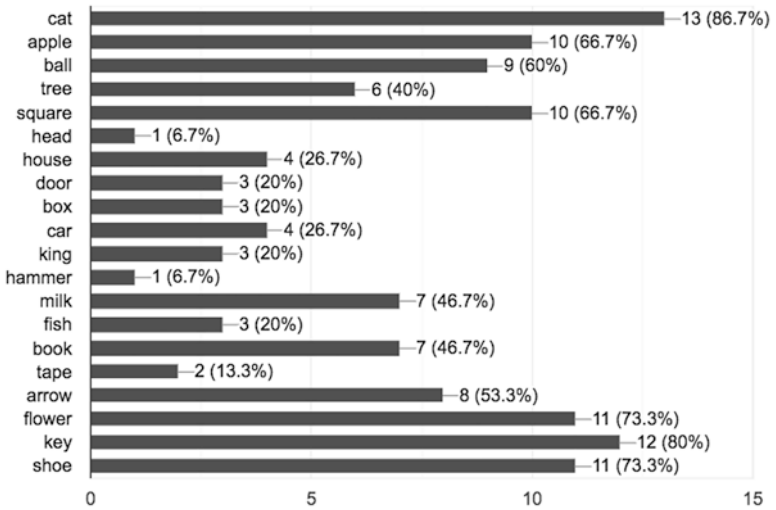

Fig. 2 Example results of the memory activity

implemented some kind of teleconference tool (e.g., Zoom), which allowed teachers to simply read the words out loud to students in the virtual classroom. However, connectivity issues proved to be a challenge as some students did not have access to a reliable internet connection. To promote the inclusivity of this learning activity, we provided a pre-recorded audio file so students with connectivity issues could play the file and still complete the activity. Students were then asked to write down as many words as they could remember without replaying the audio file. Lastly, student results were recorded into a Google Form so data analysis could be conducted. Students' answers were displayed as a frequency histogram, where a Recency/Primacy effect may be visible (see. Fig. 2)

The second activity in this lesson is a mirror tracing task, where students trace a shape (e.g., a star) while looking at the reflection of their hand in a mirror. Over time, students become quicker and more accurate in tracing the shapes, which is taken as evidence of brain plasticity. In the face-to-face curriculum, students used a physical mirror and a tracing sheet. They then scored their work based on a rubric and plotted the time it took to complete each tracing and its accuracy as a function of time.

Translating this in-person task to online required some experimentation by the curriculum team to best replicate the experience for students. A preliminary idea was developed where students would use the webcam on their computer to act in a mirror-like manner and allow the task to be done on personal devices (see Fig. 3).

This solution, however, presented problems for the *BrainWaves* team as several teachers reported that some of their students did not have access to a computer with a functional webcam. This barrier to technology integration forced the curriculum team to take a step back and to rethink how the activity could be conceptualized while maintaining the learning objective around neuroplasticity and motor learning.

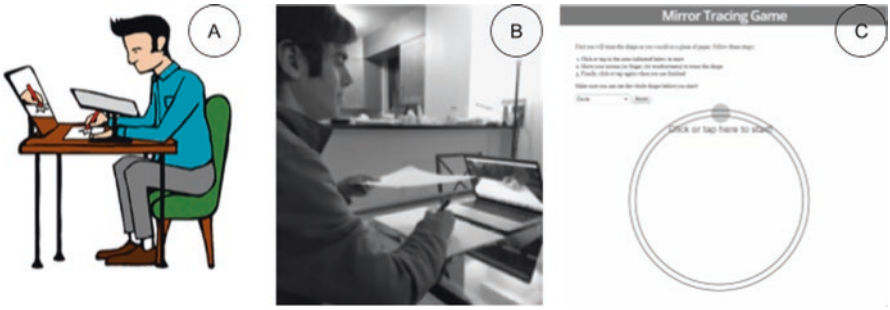

Fig. 3 Panel A: An illustration of a student completing a mirror tracing activity in a face-to-face setting (Used with permission from authors; Covington & Duff, 2018); Panel B: Demonstration of how a laptop's webcam could be used to complete a mirror tracing activity; Panel C: Screenshot of an online mirror tracing game (Image courtesy of Project NEURON/Impact on Science Education at the University of Illinois at Urbana-Champaign and supported with funding by NIH-SEPA)

At some point, it was proposed to restructure the activity to focus on the development of hypotheses while a teacher demonstrates the mirror tracing on their own device. This solution, however, shifted the learner's involvement from active to passive and, in many ways, did not feel like it was achieving the goals of the lesson. In one of our weekly curriculum development meetings, we reviewed existing software that might allow us to emulate the original experience. In this search, we found the Mirror Tracing Game by the *Project Neuron Team* at the University of Illinois (https://projectneuron.illinois.edu/games/mirror-tracing-game-intro). This web-based software provides a similar experience to the mirror tracing activity by inverting (e.g. moving the mouse up would cause the cursor to go down) the controls of the user's mouse, trackpad, or touch controls (see Fig. 3).

In an asynchronous activity, students were provided with the link to the Mirror Tracing Game and guided in selecting a shape to trace (we recommend starting with a circle or a square). They were tasked with moving their mouse (or finger, for touchscreens) to trace the shape and to record how long it took them to finish. Students were also told to take a screenshot of their attempt to share with the rest of the class. This activity was repeated several times so they could compare their first attempt with their last. Table 1 summarizes how technology was used in Lesson 3.2 to assist in the adaptation of our face-to-face activity and our associated challenges.

Lesson 4.3

As part of the *BrainWaves* curriculum, a symposium is held at the end of each semester where students share their research projects with the larger *BrainWaves* community. This event allows students across different schools to interact with one another and demonstrate what they have learned throughout the semester. Traditionally this event is held face-to-face. However, due to the pandemic, having

Table 1 Hands-on activities in Lesson 3.2 and their adaptation to online

Face-to-face activity	Remote activity & technology integration	Challenges
• Short-term memory activity • Mirror tracing	• Audio recording • Google forms • Teleconference tools • Webcam • Web-based Mirror tracing game	• Connectivity issues • Potential for redoing activity to score higher • Lack of webcams on devices • Imprecise tracing introduced by touch screen controls

an in-person research symposium was no longer safe. The emergency remote teaching curriculum team struggled with adapting the research symposium to an online format. We wanted students to have the ability to virtually gather in a single space where their work (e.g., research poster and presentation) could be prominently displayed and shared with the community. We also wanted to emulate the authentic experience of being able to walk through an exhibit hall and to experience the research of others in a fluid manner.

One of the ideas from the instructional design team was to implement a three dimensional virtual environment where users could embody an avatar, share a virtual presentation, and develop a sense of co-presence within the environment. Since many of the students lacked a reliable internet connection or a high-end computing device, we had to seek a technological solution that would support the diverse needs of our learners and audience. Upon a review of the existing commercially available software we decided to test out *Mozilla Hubs* (https://hubs.mozilla.com/), a free and open-source development kit to create collaborative 3D environments. This software was deemed to be a possible option because it worked on a wide-range of devices and promoted multiple means of representation/communication.

However, we did not want to simply wait until the last week of the semester to deploy a brand new piece of technology that students in *BrainWaves* have not used before. Therefore, the curriculum team decided to adapt an existing lesson plan and to situate it within a custom Mozilla Hubs expo hall environment. We oriented this lesson as an end-of-unit evaluation where students would explore exhibits made of video and image-based multimedia that covered topics previously covered in the curriculum. Students were given a handout that led them through an unstructured scavenger hunt where they explored the three-dimensional virtual environment to answer a series of prompts. Each exhibit within the *BrainWaves* expo hall included a question for students to answer in their worksheet. Upon finishing the activity students would compete in a Kahoot quiz.

Prior to implementation of this activity, several professional development sessions were administered so teachers could be exposed to the technology and learn how to moderate, move about, and engage within the virtual space. Wanting to consider notions of inclusion in our design, the *Mozilla Hubs* space was specifically developed and tested to ensure that it worked on desktop, tablet, and mobile devices. Instructional videos and tutorials were created by the curriculum team and included

in lesson materials. At the end of each implementation of *Mozilla Hubs*, usability and user experience feedback were obtained to adapt the design of future spaces.

Our tests with *Mozilla Hubs* worked well in small cases and professional development sessions. However, when it was deployed in actual classrooms, a number of issues emerged. Internet speed, connectivity issues, device age, and firewall restrictions caused several students to experience difficulties getting into the environment. While we were able to troubleshoot these issues and all students were able to complete the activity, we ultimately decided not to use Mozilla Hubs for the culminating research symposium. Instead, the event was presented via Zoom. Following a whole-group introduction, students from different schools presented their research in small breakout rooms, each room moderated by a science mentor or a teacher.

Results

The results of our adaptation process are organized within two research questions, as detailed in the following sections.

RQ1: What were the challenges associated with adaptation of a face-to-face science curriculum to an inclusive online environment?

Table 2 outlines the key elements in the face-to-face program, challenges encountered in the process of adapting these elements to remote instruction, strategies used to address these challenges, and a brief description of the digital tools used in this process. Since a key element of the face-to-face *BrainWaves* program is student-led investigations, where students conduct a neuroscience-inspired research project in small teams, most of the results center around key subcomponents of this activity (e.g., collecting and analyzing data).

RQ2: How did the digital tools used in the online curriculum provide accessibility and foster an inclusive learning environment?

The results pertaining to our second research question are outlined in Table 3. Throughout the emergency remote teaching adaptation process we experimented with dozens of different technological tools, some more effective than others. This table provides an overview of the software that made up much of the adapted *BrainWaves* curriculum, the interaction features that they provided, and how these tools promoted our goal of being inclusive in our design for learning.

Discussion and Implications

In the process of adapting the *BrainWaves* curriculum to online instruction due to the COVID-19 pandemic, we encountered several challenges. First, many hands-on learning activities in the curriculum did not immediately translate to an online

Table 2 Adaptation of face-to-face elements and challenges encountered

Face-to-face element	Challenges with remote adaptation	Remote adaption	Digital tools used in adaptation
Hands-on labs (recording electrical impulses from insects; sheep brain dissection)	Students do not have access to research equipment at home	An interactive live demonstration by a teacher or scientist and virtual interactive labs	Zoom/Google Classroom; Google Form (handout); Kahoot to assess understanding of content; 3D virtual brain model
Students designing research projects in small teams	Student communication in breakout rooms (videos off; connection issues)	Students collaborating in breakout rooms with support from teacher and/or scientists	Zoom breakout rooms; Google Doc
Students participating in each other's experiments	Students are not in the same physical space	Students collecting data from family members; Data collection via Google Forms	Psytoolkit; Google Form
Students collaborating with science mentors	Students never met their mentors in person which limited opportunities to build meaningful relationships	Students received mentorship through breakout rooms and other online correspondence	Zoom breakout rooms; Google Doc, email
Analysis of data	Supporting students in analyzing data	Pre-populated spreadsheet, where students enter their data and the graph is generated automatically	Google Spreadsheet
End of unit review	Connectivity issues Scaffolding the use of 3D virtual spaces Working on many devices Providing multiple means of input Emulating a symposium experience Supporting many concurrent users	Students completed a scavenger hunt activity within a 3D virtual learning environment (test environment for Mozilla Hubs) and then took a gamified Kahoot quiz.	Mozilla Hubs Expo Hall; Google Docs Scavenger Hunt; Microphone; Kahoot Quiz
In-person, multi-school, research symposium	Students might be less comfortable sharing their research in a virtual space Connectivity issues Audio quality challenges Breakoutrooms Videos off	Students presenting in small breakout room, moderated by scientists	Zoom breakout rooms (because Mozilla Hubs proved to be less inclusive)

Table 3 Technological tools used in the online program

Digital tool	Description	Interaction features	Features that promote inclusivity
Mozilla hubs	A free and open-source development kit to create collaborative 3D environments	• Communication • Control an avatar in 3D space • Create and edit 2D and 3D assets	• Works on a wide-range of devices (e.g. phones, computers, VR headsets) • Enables multiple forms of communication • Open-source with available support aids and assets for rapid development/testing
Psytoolkit	PsyToolkit is a free toolkit for demonstrating, programming, and running cognitive experiments.	• Customize experiments • Run freely • Available • Experiments • Export data	• Many work on touchscreen and computer-based • Devices • Supports many different languages in the online surveys • Hundreds of text and video-based documentation materials
Kahoot!	Kahoot! Is a gamified assessment tool that supports user-generated multiple-choice quizzes.	• Compete in game-like activities • Formatively assess knowledge	• Can be accessed via computer, mobile devices, or through the Kahoot app.
Poll everywhere	A free polling tool that allows teachers to collect student responses to questions	• Collect student responses • Measure engagement • Formatively assess knowledge	• Can be accessed via • Computer and mobile devices (can reply via text)
Padlet/ Jamboard	Collaborative web platforms where users can organize and share content to virtual bulletin boards.	• Users can upload or share different kinds of content • Content can be organized into themes • Real-time presentation of information	• Supports multiple means of representation through content • Works on a wide range of devices

environment. For example, one of the highlights of the face-to-face curriculum was a lab where students record electrical impulses from insects. In the adapted curriculum, this lab was replaced with a live demonstration by a teacher or a scientist, but this did not elicit the same level of student engagement. Similarly, an exploration of a virtual 3D human brain did not provide the same experience as a sheep brain dissection. Other science education programs addressed this challenge by sending students materials to conduct labs at home, replacing physical labs with computer simulations, or providing students with previously-acquired data (Kelley,

2020; Costabile, 2020). Each of these approaches has some shortcomings. For example, there are equity, logistical, and safety concerns associated with at-home labs. Similarly, students do not show the same gains in scientific identity and sense of ownership when analyzing existing datasets compared to when they analyze their own data (Cooper et al., 2020).

Second, a core feature of the face-to-face curriculum was students' interactions with science mentors. Science mentors (Ph.D. students and postdoctoral fellow) played a key role in supporting hands-on labs, guiding students in their research projects, and exposing students to science-related careers. In the online program, rather than face-to-face interactions, students and mentors interacted in breakout rooms and via email and shared documents. These technologies helped mentors guide student research remotely, but provided more limited opportunities for students and mentors to build meaningful relationships (Termini et al., 2021).

Third, the implementation of new technologies, like *Mozilla Hubs*, involved some logistical barriers and required attitudinal modifications (Adedoyin & Soykan, 2020). As outlined in our case study, we originally planned to use *Mozilla Hubs* as a virtual environment for the end-of-year research symposium. At first, it seemed that this tool could promote access and inclusion because it worked on a wide-range of devices, it allowed for multiple forms of communication, and it was freely available and open-source. However, the actual implementation of *Mozilla Hubs* led to a number of unforeseen technical challenges, including school network restrictions, connectivity issues, and difficulty in controlling user avatars, that directly impacted the ability for us to provide an inclusive learning environment with this tool.

As part of our adaptation process, we implemented a three-phase instructional design process (see Fig. 1). This model of design allowed us to iteratively test out new technologies and lesson plans with teachers who had experience delivering *BrainWaves* in-person prior to deploying the online curriculum with a new cohort of teachers. This was useful as it allowed us to determine if our approach and its associated technologies were truly promoting an inclusive learning environment.

Limitations

The narrative presented in this manuscript should be contextualized through the lens of emergency remote teaching. The output and design of instructional materials should not be used as an ideal case of designing materials for online learning. The rapid approach that was required may have led to a suboptimal learning experience (Hodges et al., 2020) and the solutions presented here should not be mistaken for a long-term solution. While the *BrainWaves* team made inclusivity a central tenet of our adaptation process, many challenges arose and it was often critical to implement a temporary solution that was not perfect (Smith, 2020).

That said, accessibility issues and challenges with promoting access and inclusion have plagued instructional designers since the advent of online learning

environments (e.g., Pearson & Koppi, 2002). With the rapid adaptation of content to emergency remote teaching contexts, there is unsurprisingly evidence that learning during the COVID-19 pandemic has, in many cases, worsened these divides (Aguilera-Hermida, 2020), especially for those who are most vulnerable (Zhang et al., 2020). While acknowledging the tremendous efforts of educators around the globe, it is critically important that the results be recognized as being imperfect. If institutions of learning are to thrive and adapt, they must develop new methods of supporting inclusivity by planning ahead and preparing a system of education that supports higher standards of access.

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References

Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*, 1–13.

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open, 1*, 100011.

Asgari, S., Trajkovic, J., Rahmani, M., Zhang, W., Lo, R. C., & Sciortino, A. (2021). An observational study of engineering online education during the COVID-19 pandemic. *PLoS One, 16*(4), e0250041. https://doi.org/10.1371/journal.pone.0250041

Azeka, S., Carter, S., & Davidesco, I. (2020). Neuroscientists in training. *Educational Leadership, 77*(8), 66–69.

Bailenson, J. N. (2021). Nonverbal overload: A theoretical argument for the causes of Zoom fatigue. *Technology, Mind, and Behavior, 2*(1). https://doi.org/10.1037/tmb0000030

Bergsman, K. C., & Chudler, E. H. (2021). Adapting a neural engineering summer camp for high school students to a fully online experience. *Biomedical Engineering Education, 1*(1), 37–42. https://doi.org/10.1007/s43683-020-00011-2

Bruner, J. (1993). Do we "acquire" culture or vice versa?. *Behavioral and Brain Sciences, 16*(3), 515–516.

Cooper, K. M., Knope, M. L., Munstermann, M. J., & Brownell, S. E. (2020). Students who analyze their own data in a course-based undergraduate research experience (CURE) show gains in scientific identity and emotional ownership of research. *Journal of Microbiology & Biology Education, 21*(3), 60.

Costabile, M. (2020). Using online simulations to teach biochemistry laboratory content during COVID-19. *Biochemistry and Molecular Biology Education, 48*(5), 509–510. https://doi.org/10.1002/bmb.21427

Covington, N. V., & Duff, M. C. (2018). Amnesia and the multiple memory systems of the brain. front. Young Minds. 6:45. https://doi.org/10.3389/frym.2018.00045

Dekker, S., Lee, N. C., Howard-Jones, P., & Jolles, J. (2012). Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Frontiers in Psychology, 3*. https://doi.org/10.3389/fpsyg.2012.00429

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Dubinsky, J. M., Roehrig, G., & Varma, S. (2013). Infusing neuroscience into teacher professional development. *Educational Researcher, 42*(6), 317–329. https://doi.org/10.3102/0013189X13499403

Freeman, L. (2004). The development of social network analysis. *A Study in the Sociology of Science, 1*(687), 159–167.

Gomez, F. C., Trespalacios, J., Hsu, Y. C., & Yang, D. (2021). Exploring teachers' technology integration self-efficacy through the 2017 ISTE standards. *TechTrends*, 1–13.

Goodall, B. (2001). Writing the new ethnography. Walnut Creek, CA: AltaMira.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). *The difference between emergency remote teaching and online learning*. Retrieved from: https://vtechworks.lib.vt.edu/handle/10919/104648

Howard-Jones, P. A. (2014). Neuroscience and education: Myths and messages. *Nature Reviews Neuroscience, 15*(12), 817–824. https://doi.org/10.1038/nrn3817

Impact on Science Education. (2015). Mirror tracing game [Image]. Project NEURON. http://projectneuron.illinois.edu

Johnson, J. E., & Barr, N. B. (2021). Moving hands-on mechanical engineering experiences online: Course redesigns and student perspectives. *Online Learning, 25*(1), 209–219.

Kelley, E. W. (2020). Reflections on three different high school chemistry lab formats during COVID-19 remote learning. *Journal of Chemical Education, 97*(9), 2606–2616. https://doi.org/10.1021/acs.jchemed.0c00814

Liguori, E., & Winkler, C. (2020). From offline to online: Challenges and opportunities for entrepreneurship education following the COVID-19 pandemic. *Entrepreneurship Education and Pedagogy, 3*(4), 346–351. https://doi.org/10.1177/2515127420916738

Neuwirth, L. S., Jović, S., & Mukherji, B. R. (2020). Reimagining higher education during and post-COVID-19: Challenges and opportunities. *Journal of Adult and Continuing Education, 1477971420947738*, 141–156. https://doi.org/10.1177/1477971420947738

O'Connor, C., Rees, G., & Joffe, H. (2012). Neuroscience in the public sphere. *Neuron, 74*(2), 220–226. https://doi.org/10.1016/j.neuron.2012.04.004

Pearson, E. J., & Koppi, T. (2002). Inclusion and online learning opportunities: Designing for accessibility. *ALT-J, 10*(2), 17–28.

Racine, E., Bar-Ilan, O., & Illes, J. (2005). FMRI in the public eye. *Nature Reviews Neuroscience, 6*(2), 159–164. https://doi.org/10.1038/nrn1609

Smith, C. (2020). Challenges and opportunities for teaching students with disabilities during the COVID-19 pandemic. *International Journal of Multidisciplinary Perspectives in Higher Education, 5*(1), 167–173.

Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving online learning: Student perceptions of useful and challenging characteristics. *The Internet and Higher Education, 7*(1), 59–70. https://doi.org/10.1016/j.iheduc.2003.11.003

Sperduti, A., Crivellaro, F., Rossi, P. F., & Bondioli, L. (2012). "Do octopuses have a brain?" Knowledge, perceptions and attitudes towards neuroscience at school. *PLoS One, 7*(10), e47943. https://doi.org/10.1371/journal.pone.0047943

Stake, R. E. (1995). The art of case study research. sage.

Termini, C. M., McReynolds, M. R., Rutaganira, F. U., Roby, R. S., Hinton, A. O., Jr., Carter, C. S., et al. (2021). Mentoring during uncertain times. *Trends in Biochemical Sciences., 46*, *345–348*.

Zhang, H., Nurius, P., Sefidgar, Y., Morris, M., Balasubramanian, S., Brown, J., … & Mankoff, J. (2020). How does COVID-19 impact students with disabilities/health concerns?. *arXiv preprint arXiv:*2005.05438.

Asking Better Questions: Broadening Inquiry to Design More Inclusive and Equitable Learning Experiences

Maria Hubbard and Lacretia Carroll

Introduction

Multiple disciplines have explored inclusivity and equity in learning experiences in recent years, particularly in higher education settings (Jeffries, 2019). The attention devoted to building better learning for adults in particular now includes the impact of the Covid-19 pandemic in 2020 on learning designs and systems. The pandemic was an upending event that brought forward new teaching and learning requirements. It also made gaps in access to learning and lack of trust in learning systems within some communities more noticeable (Mineo, 2020). One way to address this gap and work toward building trust with learners is to ask better questions of these particular learners and then include the findings in mindful learning designs and delivery strategies. Broadening and prioritizing inquiry in the learning design process is an imperative if learning experiences are to be trustworthy and accessible. Teaching and learning may have always intersected with identity, ethnicity, race, religion, and socioeconomic status (Ladson-Billings, 2014). However, these may have simply traveled along as passengers to other learning design considerations before their importance became more visible with increased awareness of social injustices. Educators and designers of learning experiences must seek to resolve shortcomings such as equity in education and opportunity, unconscious and implicit bias, and

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access to learning that is inclusive, meaningful, and useful. It must also leave the learner feeling heard and appreciated.

Instructional design methodology begins with inquiry in order to understand learners and their instructional needs, and then to direct the design of learning instruments and interventions (Morrison et al., 2013). It ends with inquiry to determine the efficacy of the learning instrument or experience and informs needed adjustments. Our theoretical direction suggests that applying two forms of inquiry focused on the learner in a culturally appreciative manner can guide learning designs to be more inclusive and more effective, no matter how the environment changes. The inquiries involve key stakeholders in order to (1) better understand cultural influences on current thinking and decision-making, (2) obtain insights that ensure topics are aligned with learner values while delivering on instructional objectives, (3) anticipate the learning experience will work as intended, and (4) gather actionable evaluation input to improve future learning experiences. Asking better questions and broadening the inquiry in learner-centered and culturally appreciative ways can direct outreach, research, and praxes for instructional designers. This approach also gives facilitators and teachers a line of sight into ways the communities interact with each other and share, exchange, or hand down ideas. The dividend of investing in an inquiry-driven and inclusive design can convert teaching events to learning experiences that are more engaging and impactful. These experiences have the potential to be far-reaching and have long lasting psychological and emotional effects.

Review of Literature

Inquiry is more than the initial step in the instructional design process. It is an essential component used by instructional designers to develop programs ranging from stepwise job aids and learning guides to multi-day programs and full-scale degree programs. The questions instructional designers ask tend toward identifying skill and knowledge gaps so that our programs will be useful and ultimately measurable. This works well for training programs that are performance-driven. However, it falls short for learning programs and experiences that involve more than recall of steps in a process. Learning instruments for professional or personal development draw on the learners' prior experiences and must be aligned or congruent with personal values. Grojean et al. (2004) concluded that personal values, ethics, and morals influence choices and behavior. It may be easy to overlook this distinction, especially in a didactic teaching culture. Instructional designers may utilize training design methods aimed at addressing a need to know and a requirement to do and miss the opportunity to trace the root of individual decisions that are a component of culture. As a result, learning instruments appear less inclusive and less equitable, especially for adults who may have well-formed opinions and secure cultural holdings.

Asking better questions is inclusive from the start. It offers broader and deeper views from the learner's perspective and has the power to direct learning development

and delivery toward better outcomes. The broader view allows learning design to usher a process where experience forms and re-forms ideas (Kolb, 1984). A string of questions and follow-up probes that inquire upon a person's beliefs demonstrates interest, invites dialog, and establishes an environment for critical thinking on the learner's part while building a relationship. The Socratic Inquiry method is one way to pull back the curtain to see the origins of certain behaviors and opinions through prompts to rationalize and contextualize. Appreciative Inquiry (AI) method can serve as a guide for broader understanding through its positive, strengths-based approach that has the power to inspire action to change. Combined, these two methods can direct a new practice for learning designers and educators by tracing cultural roots and expanding scope of understanding. This practice of inquiry can lead instructional designers to compose learning instruments that are more inclusive because they account for and align with social justice, equity, and community.

A famous quote attributed to Socrates is, "The unexamined life is not worth living." The interpretation of this statement is the disciplined approach to questioning to uncover complex ideas and assumptions is the Socratic Method of inquiry, also referred to as Socratic Questioning. The Socratic Inquiry method of inquiry involves formulation of a series of questions designed to clarify assertions, probe assumptions, and elicit reasoning and evidence (Hew et al., 2010). This method of inquiry challenges subjects to explain their reasoning (Xie & Ke, 2011; Yang et al., 2008). Socratic questions can focus on goals and purposes, the origin of questions, accuracy of thinking, relevance to a problem, depth of matters, and breadth of thinking (Paul & Elder, 2016). Leonard Nelson introduced the Socratic Method as a pedagogical approach in a 1922 seminal lecture, giving rise to the learner-centered process where learners actively construct their own knowledge. This transformed teaching from lecture and memorization to facilitation of learning, leading to deeper, more critical thinking and reasoning. Instructional designers may consider using depth and breadth questions to learn more about the origins of certain thinking and why their opinions matter deeply. This can satisfy the designer's need to ensure the depth of learning needs are aligned with actual needs and that the learning experience will work as intended.

AI is a second method of inquiry that can expand learning designs. AI drives the learning process by articulating positive forces that underlie systemic change. This empowers learners to have a say in shaping their learning experiences, which is directly opposed to passive learning models (Scandura, 2017). It also brings the learners' experience to bear on what they learn and what the learning means to them. As an evaluation tool, AI can be used to gather evaluation input that is immediately actionable and can improve future learning experiences. AI was introduced as a philosophy (Cooperrider & Srivastva, 1987), which stated that inquiry should involve appreciation, collaboration, and deliberately spark a reaction for the solution to be applicable and sustainable. The AI process begins with appreciating *What gives life?* or, *What is currently working?* Then follows the inquiries, *What could be? What should be?* and *What will be?* What began as a research method for more generative grounded theory building (Cooperrider &

Sekerka, 2006) has evolved to a five-step method that can be used to uncover innovative solutions.

Inquiry: The Intersection of What, When, and Who

The Socratic Method and the AI can work synergistically to help learning designers create more inclusive learning experiences. The application of these two particular methods of inquiry have the ability to shift the nature of a learning instrument from effective to affective, from systematic and tactical to emotional, personal, and meaningful. Broader inquiry utilizing better questions can increase the value of learner perspective and experience. The questions asked and the way they are asked has magnetic power. This balanced "what and how" intersects with "who" to optimize the benefits of the inquiry. This synthesized approach can draw others in and has the potential to persuade and convince. It can persuade them to think about problems and situations differently and this may convince them to make new or different decisions. It can also be a productive way to approach culturally charged topics such as vaccine reticence, same-sex marriage, gender reassignment, or animal rights. We hypothesize that learning design can be better, more inclusive, and have a broader reach and appeal if designers dig a little deeper to understand their audiences as diverse people, especially on topics like these.

The sample questions below inquire on personal and cultural aspects that lead to individuals to decline a Covid-19 vaccination. It may be assumed that mistrust has been a longstanding issue when presenting these questions to members of a marginalized community. In addition, lived experiences or known structural racism and bias may exacerbate mistrust and hesitancy. Potential questions in the Socratic Method of inquiry are listed in Table 1 below. Potential questions in the AI method are listed in Table 2.

Table 1 Socratic questions regarding the Covid-19 vaccine reticence

We understand you are not interested in taking a vaccine.
1. What experience or understanding convinced you of this?
2. What point of view are you taking for your decision?
3. Tell us more about where you are coming from in your decision.
4. Is there an ethical consideration that you are willing to share with us?
5. How much of your decision is influenced by insecurities of vaccine side effects?
6. What can you tell us about your feelings toward the vaccine?

Table 2 Appreciative Inquiry (AI) questions regarding the Covid-19 vaccine reticence

We understand you are not interested in taking a vaccine.
1. If everything were a possibility, what would you want the screening/vaccine to do for you?
2. What could experts share with you to influence your thinking to accept the screening/vaccine?
3. What do you believe the screening/vaccine should do for everyone?
4. What experience, positive or negative, have you or members of your family had when considering taking a vaccine?

The instructional designer can self-check the usefulness and applicability of the responses using the three points introduced as the suggested theoretical direction of this position paper. Specifically, do the answers provided by the stakeholders:

1. Lead to a better understanding of cultural influences on current thinking and decision-making?
2. Provide insights that ensure topics are aligned with learner values while delivering on instructional objectives?
3. Assist in anticipating the learning experience will work as intended?
4. Allow for actionable evaluation input to improve future learning experiences?

If the response to any of these self-check questions is "no," then the instructional designer has additional work to do before starting the project. For instance, if the designer still has access to the stakeholders, he or she might ask follow-on probing questions. At all times, the designer must be mindful of the potentially sensitive or emotional nature of the subject matter, and especially if there is a need to re-engage the stakeholders. The questions presented are indeed only part of the entire inquiry scenario, and broadening the inquiry using the Socratic Method and AI Method are potentially a best practice regardless of the topic.

Potential Challenges

Challenges presented by this approach could include access to stakeholders and the amount of interaction needed to establish trust and confidence with stakeholders. When a personal introduction from a trusted source is not possible, an empathetic mindset can be most useful, especially when there is a need to build trust and establish confidence quickly. Other potential challenges are the amount of time required to make the inquiry and the effort involved in translating inquiry results. Planning for challenges such as these can mitigate obstacles as we work to make learning designs more inclusive. Additionally, when challenges like these are viewed as opportunities rather than obstacles, new avenues open toward longer-term relationships that work to build community and bridge divides in education.

Summary

We believe asking better questions leads to learning designs that are inclusive and instructionally sound. Learning designs can be more inclusive if the design plan begins with asking better questions. Reaching out to the right stakeholder group, offering special attention to inquiry responses, and being alert to non-verbal messages and general behavior work together to set a proper stage for designing and developing learning experiences that are meaningful and useful to the learner. The result of such an investment for both the learning designer and the learners is an enhanced ability to shift from emotional reactions to rational responses without losing cultural perspectives and influences.

References

Boroson, B. (2017). Inclusive education: Lessons from history. *Educational Leadership, 74*(7), 18–23.

Cooperrider, D. L., & Sekerka, L. E. (2006). Toward a theory of positive organizational change. In J. V. Gallos (Ed.), *Organization development: A Jossey- Bass reader* (pp. 223–238). Jossey- Bass.

Cooperrider, D. L., & Srivastva, S. (1987). Appreciative inquiry in organizational life. In R. W. Woodman & W. A. Pasmore (Eds.), *Research in organizational change and development, vol. 1* (pp. 129–169). JAI Press.

Cooperrider, D. L., & Whitney, D. (2005). *Appreciative inquiry: A positive revolution in change*. Berrett-Koehler.

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage.

Dreyer, L. (2017). Inclusive education. In L. Ramrathan, L. Grange, & P. Higgs (Eds.), *Education for initial teacher training* (pp. 383–400). Juta & Company (Pty).

Grojean, M. W., Resick, C. J., Dickson, M. W., & Smith, D. B. (2004). Leaders, values, and organizational climate: Examining leadership strategies for establishing an organizational climate regarding ethics. *Journal of Business Ethics, 55*, 223–241.

Hew, K. F., Cheung, W. S., & Ng, C. S. L. (2010). Student contribution in asynchronous online discussion: A review of the research and empirical exploration. *Instructional Science, 38*(6), 571–606. https://doi.org/10.1007/s11251-008-9087-0

Jeffries, R. B., & IGI Global. (2019). *Diversity, equity, and inclusivity in contemporary higher education*. IGI Global Information Science Reference.

Kolb, D. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Ladson-Billings, G. (2014). Culturally relevant pedagogy 2.0: a.k.a. the remix. *Harvard Educational Review, 84*(1), 74–84.

Mineo, L. (2020). *The pandemic's impact on education*. The Harvard Gazette. Retrieved from https://news.harvard.edu/gazette/story/2020/04/the-pandemics-impact-on-education/

Morrison, G. R., Ross, S. M., Kalman, H. K., & Kemp, J. E. (2013). *Designing effective instruction* (7th ed.). Wiley.

Paul, R., & Elder, L. (2006). *The art of Socratic questioning*. Foundation for Critical Thinking.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American psychologist, *55*(1), 68.

Paul, R., & Elder, L. (2016). *The thinker's guide to socratic questioning*. The Foundation for Critical Thinking.

Scandura, T. A. (2017). Appreciative inquiry: An experiential exercise and course feedback tool. *Management Teaching Review, 2*(2), 141–150. https://doi.org/10.1177/2379298116683324

Trepanier, L. (Ed.). (2017). *The socratic method today: Student-centered and transformative teaching in political Science* (1st ed.). Routledge. https://doi.org/10.4324/9781351245821

Xie, K., & Ke, F. (2011). The role of students' motivation in peer-moderated asynchronous online discussions. *British Journal of Educational Technology, 42*(6), 916–930. https://doi.org/10.1111/j.1467-8535.2010.01140.x

Yang, Y.-T. C., Newby, T. J., & Bill, R. L. (2008). Facilitating interactions through structured web based bulletin boards: A quasi-experimental study on promoting learners' critical thinking skills. *Computers & Education, 50*(4), 1572–1585. https://doi.org/10.1016/j.compedu.2007.04.006

Business Education for Responsible Leadership: Preparing Students

Amy M. Grincewicz, Cathy L. Z. DuBois, and David A. DuBois

Over the last decade, an emerging trend in the business community has been a shift from "shareholder capitalism" to "stakeholder capitalism." During this period, this trend has moved from the leading edge to the mainstream of the nation's largest, most established businesses, as evidenced by the recent statement on the purpose of an organization by members of the Business Roundtable (2019). This shift is in response to the multiple and varied ways in which the world has changed. Led by consumers and the investment community, the bar for retaining trust, respect, and confidence in a firm has been raised beyond the price and quality of a product or service to include the social and environmental impacts that organizations produce. This chapter provides a case study in how one college of business has adapted to these important and substantial changes to business norms. We begin by sharing the drivers of this shift in curriculum and culture within the college. Next, we explore how we approached this strategic shift and share the programs and practices we adopted. We close by sharing the design strategies we employed, as well as the challenges we faced on this journey to prepare our students to serve as future leaders in this transformed business environment.

Drivers of the Shift Towards Sustainability

One of the hallmarks of American enterprise is the agility and innovation with which it adapts to marketplace dynamics. So, it should not come as a surprise that business strategies and models evolved in response to how major societal trends and

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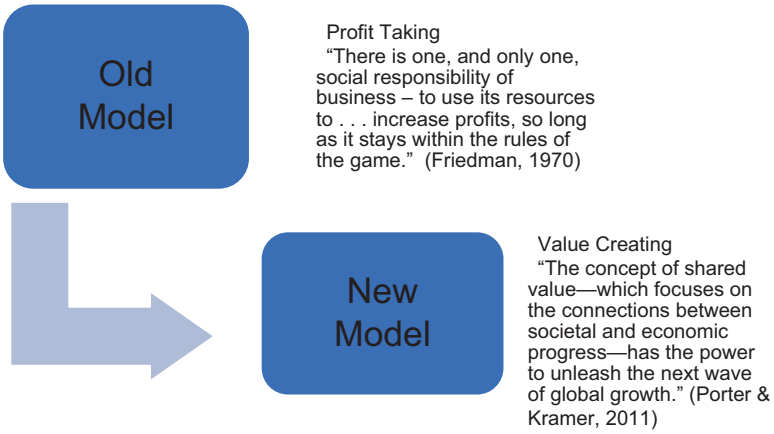

Fig. 1 The evolution of business models towards sustainability

environmental challenges impacted the economy, and the markets in which companies operate. We characterize this shift in the last decade towards embedding sustainability at the core of the business DNA as a fundamental change to business models. This change involves a move from a sole interest in "profit-taking" to a more comprehensive model of "value-creating." The essence of this shift is captured well by thought leaders from two different eras of business, as displayed in Fig. 1.

For our college of business, our journey was driven by three main factors, each a shift in a context that is highly relevant to our work of educating the management leaders of tomorrow. First, we were responding to the scientific and public media reports documenting the rising importance of environmental challenges and societal issues. Second, we were affected by the changes in strategies and models we observed in the business community. Third, we were influenced by our accrediting association and peer institutions who were also elevating and addressing these issues. Taken together, the impact of changes in these three key contexts shaped our path in how we adapted sustainability within the curriculum and the culture of the college.

As an institution dedicated to the creation and transmission of knowledge through research and teaching, the University plays a leading role in the dissemination and application of possible solutions and alternatives to the socio-environmental problems facing today's society. The United Nations Educational, Scientific and Cultural Organization (UNESCO) recognizes that education is a key element in the achievement of sustainable development. To advance towards this goal, in 2015 UNESCO defined 17 Sustainable Development Goals (SDGs) that must be reached by 2030. A College of Business (CoB) for a state university has embedded the SDGs into the curriculum to prepare students for their careers. In 2017, the CoB launched the Responsible Leadership Initiative (RLI). The RLI promotes business as a force for good and demonstrates through practice and research how business can drive achievement of the 17 Sustainable Development Goals established in 2016 by the

United Nations Global Compact. The Responsible Leadership Initiative is supported by the College's core values of respect, ethics, collaboration, and a sense of purpose in all we do.

The integration of Education for Sustainable Development (ESD) in higher education contributes to the development by university graduates of sustainability competencies, such as critical and creative thinking; problem solving; capacity for action, collaboration, and systemic thinking, thereby training potential agents of, capable of configuring more sustainable societies (Ceulemans et al., 2015). Many r international declarations committing them to the ko introduction of Sustainable Development in their educational policy, including the curriculum, research, and social projection. SDGs are envisaged to address the inequality and crippling conditions existing in the society that put certain social groups into disadvantage and margins. It is a commitment to create a just and egalitarian society. It puts the notion of sustainable development at the center where democracy and people's participation are the vehicles to ensure an all-inclusive society.

To create responsible leaders the Online MBA utilizes a variety of learning design elements to promote deep learning centered around the SDGs. The Master of Business Administration (MBA), which refers to an internationally recognized degree designed to prepare students and further develop their required skills for careers in business and management, has been recognized as one of the most popular professional degrees worldwide since the last few decades (Baruch & Leeming, 2001). Today's typical full-time MBA program is structured around three key areas: core courses, elective courses, and extracurricular activities including professional and social clubs as well as immersion and business consulting experiences. The MBA by nature is interdisciplinary as the core courses range from Accounting, Economics, Finance, Marketing, Management, and Information Systems with electives occurring within these core areas along with other colleges across the higher education institution. Overall, MBA students. Diverse learning opportunities. This chapter will explore how the SDGs are designed into the learning activities within the Online MBA to create responsible leaders.

The SDG Framework

The Sustainable Development Goals (SDGs) are a set of 17 "Global Goals' for making the world a better place. They were developed by the 193 member nations of the United Nations. The SDGs were launched in 2016, with an agreement to achieve them by 2030. The agreement was forged at a conference in Rio de Janeiro, Brazil in 2012 and is a non-binding agreement. The goals are also known as the "Global Goals," the 2030 Agenda, or simply, the "SDGs." As noted by the then Secretary General of the UN, Ban Ki-moon, "We have only one planet. There is no Plan B because there is no Planet B."

The SDGs address the full range of social, environmental, and economic activities of life (see Fig. 2). Each Goal has b parts (United Nations, 2020):

Fig. 2 The 2030 United Nations Agenda for Sustainable Development Goals. (Source: https://www.un.org/development/desa/disabilities/envision2030.html; used with permission)

1. Goal Statements include a description of the purpose of the goal.
2. Targets include a set of objectives that specifies what should be achieved.
3. Indicators include a list of potential metrics to assess our progress on each goal.

Additionally, most descriptions of the SDGS also provide additional information such as key facts and figures that help identify why this goal is important.

The SDGs matter because they represent a consensus among the representatives of 193 countries who worked together to create them, and then came together to commit to them, to share best practices, and to collaborate to achieve them over the next decade. Second, the SDGs provide a defined set of metrics for assessing where we are now in each of these areas of endeavors. Next, they represent a ready reference for making sense of our world. These goals emerged out of major trends that impact the world and offer specific targets for the activities and accomplishments that are needed. Because of its wide acceptance, many major corporations use this framework to report their sustainability activities and accomplishments. Finally, the goals and metrics help us identify important business opportunities, and useful opportunities to collaborate with nonprofit organizations and government agencies.

Integration of the SDGs into curriculum supports a "triple bottom line" approach to managing and evaluating business effectiveness. The triple bottom line of "People, Profit, Planet" suggests that, in addition to counting their financial profits, organizations must also assess their impacts on the full array of their stakeholders, such as their employees, suppliers, and communities, as well as their environmental impacts on the planet. This represents a transformative change in how executives

and organizations approach business. Organizations across the globe are now creating new ways for people to live and thrive in a manner that respects the planet's ecosystems and recognizes the significance of a healthy global social system.

For the last decade, this new, sustainable model of business represents a fast-growing trend as more businesses recognize what consumers, employees, and other stakeholders embrace a triple bottom line approach of business as a force for good. However, there are major differences in how deeply and how well companies are incorporating sustainability into their operations. Some do it in "bolt-on" fashion, where it is a symbolic or superficial gesture, designed to impress consumers. Sometimes, these efforts can be very misleading, and are then called "greenwashing." In contrast, some companies take sustainability very seriously, and reinvent their entire firm around sustainability. They change their mission and vision statements to fully incorporate sustainability into the DNA of the company and reinvent their operations and products to conform to sustainable practices.

The SDGs provide a framework and common language for educating students on how to create and lead responsible business initiatives that contribute value to workers, communities, and the environment in addition to generating profits.

Responsible Leadership Initiative

The College of Business is dedicated to creating a competitive Online MBA program that will prepare students to be responsible leaders who capably lead organizations by attending the contextual needs of society and the environment as they address business needs. Muff et al. (2020) define the responsible leader as one who "demonstrates a deep understanding of the interdependencies of the system and the own person, is distinguished by an ethical and values-based attitude, and able to build long-term relations with different stakeholders embracing their needs, while initiating change towards sustainable development" (p. 2257). Responsible leaders engage in reflexive practices and aspire to upholding a "responsible" mindset (Eriksen & Cooper, 2018). This mindset is based on the responsible leader possessing the ability to intentionally respond to others within the unfolding ethical and moral situations they find themselves in and make "moral and principled decisions by considering their impacts on others" (Pless & Maak, 2011, p. 8).

Maak and Pless (2006) define responsible leadership as the process that leads to building and sustaining positive relationships with all stakeholders. Rather than focus on attributes of the leader or the dyadic leader–follower relationships, Maak and Pless identify a set of roles for responsible leaders, providing a framework or mindset for dealing with seemingly competing demands from multiple stakeholders. These roles include steward, global citizen, change agent, architect, storyteller/meaning maker, visionary, coach, and servant.

Inspired by internationally accepted values in the United Nations Global Compact (UNGC), the six Principles for Responsible Management Education (PRME), broadly categorized as purpose, values, methods, research, partnership, and dialog,

are intended to guide the preparation of "a new generation of business leaders capable of managing the complex challenges faced by business and society in the twenty-first century" (PRME, 2017). The PRME initiative engages business schools and universities worldwide in improving their institutional strategies, curricula, research, teaching methodologies, and delivery models to promote an inclusive, sustainable global economy. Waddock et al. (2010) point out that commitment to PRME affects both implementation and assessment, including what is taught (content), how it is taught (process), the environment in which it is taught (context), and how learning outcomes are measured (assurance of learning). These are critical issues as economic crises and public awareness of sustainability alter expectations for business schools to prepare globally minded, ethical leaders who can responsibly address today's problems and tomorrow's challenges.

The College implemented their Responsible Leadership Initiative to highlight the range of activities within the college that addressed SDG-related research, as well as SDG-related curricular and extra-curricular activities in the college. Special attention was given to SDG curricular integration in the MBA program, for to manage organizations responsibly, MBA graduates must apply cross-functional knowledge and tools to understand stakeholder perspectives, recognize cause and effect (both intended and unintended), inspire commitment, lead change, and serve organizations and communities for short-and long-term vitality.

Program Design Based on Meaningful Learning

There are a variety of perspectives and strategies for designing learning environments around the SDGs and responsible leadership within higher education (Gadelshina et al., 2018; Dyllick, 2015; Muff et al., 2020). It has been argued that delivering education supporting the SDGs requires institutions to adopt pedagogical strategies that offer a variety of environmental and equity issues (Mulder et al., 2012). To create responsible leaders the Online MBA utilizes a variety of learning design elements to promote meaningful learning centered around the SDGs and responsible leadership by students actively exploring these topics throughout each course.

Meaningful learning construction is linked with strategies such as inquiry and problem solving, resulting in the ability to identify and analyze the underlying structure and connect existing with new concepts (Jonassen, 2003). For meaningful learning to occur, students need: (1) a reason for learning; (2) to engage in a set of learning activities that can help them to achieve their learning goals; and (3) proper scaffolding and other aids to help them derive targeted content and skills from their experiences. Savery and Duffy (1996) note that students' goals can act as a primary pivot point around which context, content, and learning activities can evolve. Csikszentmihalyi (1997) points out that when students are engrossed in achieving personally meaningful goals, they will achieve a state of "flow" that can only come about from active interaction between the learner and his/her learning environment.

These researchers tell us that once someone has a goal, the physical, social, and emotional environment they engage in will suggest and motivate the generation of new goals and sub-goals. As people generate, evaluate, and refine alternative solutions to challenges they aim to achieve, they identify the knowledge and skills they need to learn, setting up new goals for themselves. It thus makes sense to design learning activities centered on goals that students are likely to take on as their own.

To support meaningful learning the courses are designed with the following learning attributes: active, constructive, intentional, authentic, and cooperative (Howland et al., 2011; Mystakidis, 2019). Active learning is an instructional method that engages students in the learning process by requiring them to interact with content in the learning environment, engage with the subject matter to make a personal cognitive contribution (Bonwell & Eisen, 1991). Constructivism is "an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner" (Elliott et al., 2000, p. 256). In constructivist learning, students are expected to construct continuously their own meaning by interpreting and reflecting on observed phenomena, content, and the results of their actions. Intentional learning is generally defined as learning that is motivated by intentions and is goal directed where the learner invests effort in reflection and in controlling and maintaining learning strategies (Bereiter & Scardamalia, 1989). Authentic learning encourages students to explore, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant to the learner (National Research Council, 1999). In addition to these independent learning attributes, the courses include cooperative learning by learners engaging in group collaboration to create a learning community (Johnson, 2003). These five learning attributes are integrated into the learning activities in the course courses that align to multiple outcomes (Silber, 2010).

Each course in the program integrates the SDGs and responsible leadership in a creative way to ensure program learning outcomes (PLOs) are being mastered.

- Economics courses: provide essential economic knowledge for responsible leadership decisions by studying several decision-making processes and discussing the relevance and trade-offs involved with each…ethics, equality, and efficiency. The SDG goals of no poverty and higher economic growth are more salient in these courses.
- Law and Ethics course: addresses the concept of Responsible Management/Leadership with the use of the course theme of developing legally astute business managers who minimize legal risk while promoting business ethical concepts and cultures. The SDGs are addressed as part of developing the responsibly ethical business manager throughout the course.
- Global Technology Strategy course: focuses on SDG goals 1,3,6,7,8. Students learn about how technology is being used to change lives for the better as well as how digital transformation reduces carbon footprints. Responsible management is an underlying theme throughout the course.

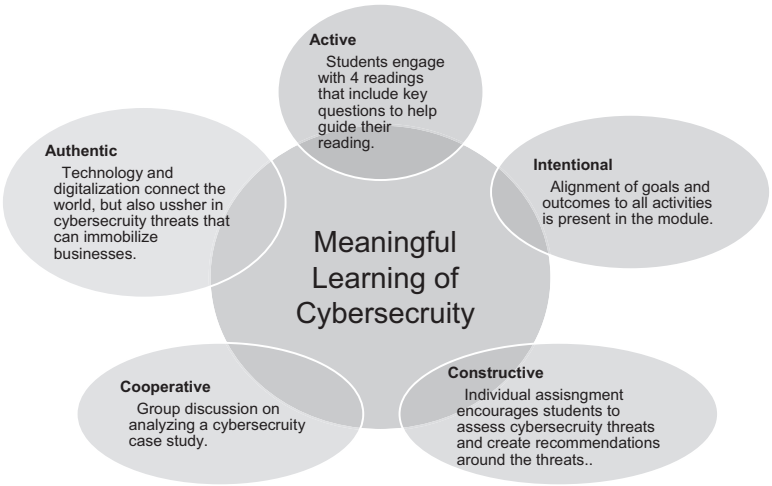

Fig. 3 Example of meaningful learning in Global Technology Strategy, SDG Goal 8—Decent Work and Economic Growth

- Leadership course: covers concepts that fit with good health and well-being, gender equality, the decent work part of decent work and economic development, reduced inequalities, and quality education.
- Capstone course: students discuss how and why there is an increased awareness for responsible management; what the students' companies are doing (with specific examples), and whether these initiatives are helping or hurting their relative performance in their markets. The case analysis and class discussions focus on the following SDGs: decent work and economic growth (#8), industry, innovation and infrastructure (#9), responsible consumption and production (#12), partnerships for goals (#17).

The above items are just a few examples of how this content is integrated into coursework. While faculty do not cover all SDGs in each course, they address those SDGs which are most relevant within a course's content structure. Fig. 3 illustrates the connection between the five attributes of meaningful learning and the SDGs in the Global Technology Strategy course. Unfortunately, space does not permit a full listing SDG-related of content in all courses.

Challenges Encountered

This endeavor was clearly a team effort on the part of administration, the instructional design expert, and numerous MBA faculty. The foundation for taking this direction was the college's Responsible Leadership Initiative, which provided a

platform and rationale for integrating the content into coursework. Industry experts from both local and global organizations were brought in to talk with faculty about the growing presence of sustainability and CSR in their organizations, and about how they summarize their relevant activities and initiatives in their sustainability reporting. As is typical in curricular change, some faculty eagerly shifted while others were reticent to take appropriate steps to learn how the SDGs related to their courses and/or to make room for this content coverage in their syllabi. Reinforcement came in 2019 from the Business Roundtable statement (referenced earlier). In 2020 the leading business accrediting body, AACSB, approved a new set of business accreditation standards. They used the term *societal impact* to address environmental and social sustainability and require that business schools/colleges report on how it is addressed in their mission, curriculum, and research; their new Standard 9 addresses how the business school/college provides societal impact in their community.

As such, what made this transition possible was the layered approach we took over several years: discussing, encouraging, and supporting this expansive change, but not demanding it. Essential to the process was the role of our senior instructional designer who utilized the Quality Matters (QM) Rubric for Higher Education™ (https://www.qualitymatters.org/) to implement and ensure online quality assurance within the program (Grincewicz et al., 2022). QM is an international, non-profit organization centered on improving the design of online and hybrid courses (Adair & Shattuck, 2015; Quality Matters, 2018). In addition to a rubric to ensure quality in courses, QM has also created a series of 4 individual online program certifications that online programs may seek: Online Program Design, Online Teaching Support, Online Learner Support, and Online Learner Success. The senior instructional designer worked with the faculty on the design of each course and led the way to obtaining QM Certification for all core MBA courses and QM Program Design certification (which led to her promotion to Director). She was always aware of where and how this content was being incorporated in courses and provided suggestions throughout course development. Further, to support obtaining QM Program Design certification, she regularly highlighted that faculty needed to identify one theme that could run throughout the program. When it was time to vote on this theme, no one offered a better idea than Responsible Management, and it became official. Following this vote, faculty knew the importance of reflecting this theme with a new program learning outcome:

Responsible Management Analyze the complex issues confronting organizations and craft solutions to business problems that create long term value and shared prosperity for the broad array of stakeholders.

Are we where we want to be? Decidedly not! We have many more layers to go. But the progress we have made is significant and meaningful. We have debated with others who are committed to sustainability whether an incremental progress approach like this can be sufficient, or whether taking a transformative redesign approach is required—one that tosses out traditional curriculum and builds it from

the ground up within a framework of social justice and sustainability. We advocate for both. While the transformative approach might be the ideal way to craft a system that dramatically shapes new thinking, few colleges have the luxury of taking the radical approach. Most of us must live within an existing system of administration, staff and faculty, one that creates boundary conditions to the extent that incrementalism is the only option. Without the capacity to hire several expert faculty who are grounded in social justice and sustainability, we work with what we have. We have seen the benefits of relentless incrementalism and are committed to it. Given time, even faculty who resist this content eventually begin to see the light. These faculty experience that students engage with the SDGs and encourage faculty to delve more deeply into this content. They encounter a growing number of articles both in research journals and in the professional press that pose a compelling drive toward sustainable and socially responsible approaches to business. We also understand that faculty have many competing demands for their time within the common domains of research, teaching and service. Mastering new knowledge, shifting the foundational models in their disciplines, and integrating new ideas into their courses takes time, patience, encouragement, and support. It also requires that administration presents a relentless drumbeat for why this is necessary. Eventually the magic happens.

Discussion

Our journey of integrating the SDGs and value creation into our MBA curriculum has been most rewarding. Our MBA focuses on creating an equitable education, offering a variety of life-long learning opportunities to our students to support the United Nation's 17 goals for sustainable development (United Nations General Assembly, 2015). As noted above, it has required a solid team effort, with meaningful contributions from each party. This curricular content effort dovetailed beautifully with improved instructional design required by QM Certification at both the course and program levels. Each course in the program is unique and includes innovative learning design frameworks that focus on the responsible management theme and integrating the SDGs. The courses align the program mission of preparing students for responsible leadership positions in private, nonprofit, and public organizations. Upon completion of the program, graduates will demonstrate a global mindset and competence in critical thinking, digital technology, communication, teamwork, and ethical management. Support from administration must provide a firm foundation upon which instructional designers and faculty can build. We strongly encourage other colleges to boldly go forth in this direction. Students will increasingly demand this substantive approach to purposeful business, which can address a range of substantive world needs.

References

Adair, D., & Shattuck, K. (2015). Quality Matters™: An educational input in an ongoing design-based research project. *American Journal of Distance Education, 29*(3), 159–165.

Baruch, Y., & Leeming, A. (2001). The added value of MBA studies: Graduates' perceptions. *Personnel Review, 30*(5), 589–602. https://doi.org/10.1108/EUM0000000005941

Bereiter, C., & Scardamalia, M. (1989). Intentional learning as a goal of instruction. In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 361–392). Lawrence Erlbaum.

Bonwell, C. C., & Eisen, J. A. (1991). *Active learning: Creating excitement in the classroom*. School of Education and Human Development, George Washington University.

Business Roundtable. (2019). *Statement on the purpose of a corporation*. BRT-StatementonthePurposeofaCorporationJuly2021.pdf

Ceulemans, K., Molderez, I., & Van Liedekerke, L. (2015). Sustainability reporting in higher education: A comprehensive review of the recent literature and paths for further research. *Journal of Cleaner Production, 106*, 127–143. https://doi.org/10.1016/j.jclepro.2014.09.052

Csikszentmihalyi, M. (1997). *Creativity: Flow and the psychology of discovery and invention*. HarperCollins Publishers.

Dyllick, T. (2015). Responsible management education for a sustainable world: The challenges for business schools. *Journal of Management Development, 34*(1), 16–33.

Elliott, S. N., Kratochwill, T. R., Littlefield Cook, J., & Travers, J. (2000). *Educational psychology: Effective teaching, effective learning* (3rd ed.). McGraw-Hill College.

Eriksen, M., & Cooper, K. (2018). On developing responsible leaders. *Journal of Management Development, 37*(6), 470–479. https://doi.org/10.1108/JMD-12-2016-0283

Friedman, M. (1970, September 13). The social responsibility of business is to increase its profits. *The New York Times*.

Gadelshina, G., Vemury, C., & Attar, A. (2018). Meaningful learning and the integration of responsible management education in the business school courses. *International Journal of Modern Education Studies, 2*(1), 24–33. https://doi.org/10.51383/ijonmes.2018.18

Grincewicz, A. M., Simunich, B., & DuBois, C. (2022). The business of online quality: Design approaches and change management considerations for online MBA programs. In S. Kumar & P. Arnold (Eds.), *Quality in online programs: Approaches and practices in higher education*. Koninklijke Brill NV. https://doi.org/10.1163/9789004510852_004

Howland, J. L., Jonassen, D. H., & Marra, R. M. (2011). *Meaningful learning with technology* (4th ed.). Pearson.

Johnson, D. W. (2003). Social interdependence: The interrelationships among theory, research, and practice. *American Psychologist, 58*(11), 931–945. https://doi.org/10.1037/0003-066X.58.11.934

Jonassen, D.H. (2003). Learning to solve problems with technology: A constructivist perspective, 2nd ed.; Merrill: , 2003; ISBN 9780130484031.

Maak, T., & Pless, N. M. (2006). Responsible leadership in a stakeholder society: A relational perspective. *Journal of Business Ethics, 66*(1), 99–115. https://doi.org/10.1007/s10551-006-9047-z

Muff, K., Liechti, A., & Dyllick, T. (2020). How to apply responsible leadership theory in practice: A competency tool to collaborate on the sustainable development goals. *Corporate Social Responsibility and Environmental Management, 27*(5), 2254–2274. https://doi.org/10.1002/csr.1962

Mulder, K. F., Segalas, J., & Ferrer-Balas, D. (2012). How to educate engineers for/in sustainable development: Ten years of discussion, remaining challenges. *International Journal of Sustainability in Higher Education, 13*(3), 211–218.

Mystakidis, S. (2019). *Motivation enhanced deep and meaningful learning with social virtual reality*. University of Jyväskylä.

National Research Council. (1999). *How people learn: Bridging research and practice*. The National Academies Press. https://doi.org/10.17226/9457

Pless, N. M., & Maak, T. (2011). *Responsible leadership*. Springer.
Porter, M. E., & Kramer, M. R. (2011). Creating shared value. *Harvard Business Review, 89*(1/2), 62–77.
Principles for Responsible Management Education (PRME). (2017). *Principles for responsible management education*. Available at: http://www.unprme.org/about-prme/the-six-principles.php
Quality Matters. (2018). *Quality Matters: Higher education rubric workbook* (6th ed.). MarylandOnline.
Savery, J., & Duffy, T. M. (1996). Problem based learning: An instructional model and its constructivist framework. In B. G. Wilson (Ed.), *Designing constructivist learning environments*. Educational Technology Publications.
Silber, K. H. (2010). A principle-based model of instructional design. In K. Silber & W. Forshay (Eds.), *Handbook of improving performance in the workplace* (Vol. 1, pp. 23–52). Pfeiffer.
United Nations General Assembly. (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*. https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development17981
United Nations (2020). *Sustainable development goals*. Available at: https://sustainabledevelopment.un.org/?menu=1300
Waddock, S., Rasche, A., Werhane, P. H., & Unruh, G. (2010). The principles for responsible management education: Where do we go from here? In D. Fisher & D. Swanson (Eds.), *Towards assessing business ethics education* (pp. 13–28). Information Age Publishing.

Centering Learner Agency and Empowerment: Promoting Voice and Choice in Online Courses

Bethany Simunich, Racheal Brooks, and Amy M. Grincewicz

Crucial conversations about inclusive design strategies have recently become more prominent, most notably in response to the educational equity issues surrounding remote learning. This chapter aims to focus on one aspect of inclusive, student-centered instructional design practices known as *voice* and *choice*. Voice refers to empowering students to contribute their ideas and perspectives based on their existing knowledge, experiences, and interests. Choice refers to course learning situations where students are provided an opportunity to make decisions about their learning. Taken together, these two student-centered strategies provide a platform to cognitively engage and empower students in their learning.

The concepts of voice and choice are related to learner agency, and all three are encapsulated in the broader umbrella of personalized learning environments (PLE). Learner agency gives students voice and choice in how they learn, in that they are able and supported to make choices and take actions in self-directed ways and are, ideally, prompted to find meaning and relevance in that work. PLE refers to an educational environment where students contribute to the decision process of what and how they will learn, in part because they act as subjects and owners of their own learning process, rather than objects. PLE enables students to collaborate through resources outside of their predefined online learning environment. Bray and McClaskey (nd.) define a "personalized learning environment" as one in which students "have a voice in what they are learning based on how they learn best" and

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"have a choice in how they demonstrate what they know and provide evidence of their learning. In a learner-centered environment, learners own and co-design their learning" (p. 14). Similarly, the U.S. Department of Education (2016) defined personalized learning as "instruction in which the pace of learning and the instructional approach are optimized for the needs of each learner. Learning objectives, instructional approaches, and instructional content (including its sequencing), all may vary based on learner needs. In addition, learning activities are meaningful and relevant to learners, driven by their interests, and often self-initiated" (p. 7).

Walkington and Bernacki (2014) frame different approaches to personalization as differing on three key dimensions. First, personalization can occur at variable degrees of depth, which captures the extent to which instructional tasks both take into account and capture the lived, authentic experiences of learners. Second, personalization can occur for different numbers or groups of students, including for individual learners, for small groups of learners matched on specific dimensions, or for larger groups based on more general parameters. And finally, personalization can vary with respect to ownership – the degree to which learners are given control and choice in the learning situation. In expanding on ownership, learners can develop a sense of agency so they can self-advocate, self-regulate, and ultimately self-direct their learning. In sum, personalized learning includes aspects of meaningfulness and relevancy to the individual student, as well as opportunities related to individual experience, and the degree to which students are given choice in the learning environment. Voice is reflected in these components of meaningfulness and authentic, lived experiences, while choice speaks to the learner agency aspect of personalized learning.

Elevating Learner Agency

When learners have voice and choice, they develop a sense of ownership for their learning, creating a sense of learner agency. As previously mentioned, learner agency is an integral component of personalized learning environments. Voice and choice, in turn, are components of learner agency by enabling the learner to have input on the materials and activities that most engage them and assist them in their learning. Agency also enables making connections to past experiences, evaluating and judging information and outputs, and making linkages to future topics and activities (Emirbayer & Mische, 1998). Elevating learner agency via voice and choice is also one, good way to traverse the boundaries between formal and informal learning contexts. Students should be able to draw on learning contexts from outside of formal education, and be encouraged to share their lived experiences and prior knowledge. In this way, learning becomes more personalized, relevant, and meaningful.

Learner agency is crucial to learning in the form of meaning-making, knowledge construction, and developing competence in a given field (Blair, 2009). Agency is also often seen as dynamic, emerging, shaped in and by interaction, and is mediated

by structure and tools. In addition, closely connected to the concept is individuals' *sense* of their agency (see Bandura, 1997 and 2001 on self-efficacy); that is, the way individuals feel they are able to "make a difference" (Mercer, 2012, p.41) in their own learning in a particular context. Mercer (2011, 2012) argues that agency encompasses the deliberate, agentic behavior of the learners, plus their sense of awareness of their own agency. This would suggest that when exploring agency, observational and reflective data should be combined to capture these different components.

Promoting Inclusion and Democratization

Numerous studies identify voice and choice as an essential component of creating equitable and inclusive learning environments as well (Boyle-Baise & Gillette, 1998; Clauhs & Cremata, 2020). Inclusive design focuses on student-centered approaches for creating learning environments that meet the needs of diverse learners, and provides opportunities for learners to demonstrate understanding, skills, and competencies in a variety of formats. Common considerations in inclusive design include learner ability and preferences, cultural and experiential knowledge, motivation, neurodiversity, power dynamics and systemic inequalities, as well as technology limitations and barriers. Inclusive learning environments can support the development of individuals who recognize their importance in the global community, are confident in exercising their autonomy, and, in turn, value the perspectives of others. Additionally, learners across identity groups benefit broadly in their development of critical thinking skills and cognitive engagement skills when they can learn from and engage with one another, particularly in the online space.

Further, well-designed and inclusive courses can facilitate good learner-instructor and learner-learner interactions, dialogue, and collaborations, which can promote equity and empower learners from diverse backgrounds (Blau & Shamir-Inbal, 2018). An inclusive design approach promotes trusting relationships and engagement among students and faculty, enhances curriculum rigor, and fosters respect of diverse thought. Through purposeful activities and amplification of learners' voices, students are empowered to co-construct inclusive learning environments that value diverse thought and learning practices. Additionally, inclusive design practices, including voice and choice, validate learners' lived experiences, honor their cultural knowledge and proximity, and provide a platform by which they can contribute to the knowledge of the collective. When constructing these course interactions, however, it is imperative to acknowledge that intrinsically diverse education involves the integration of multicultural instructional strategies, which can only be uncovered by seeking "explicit knowledge" about cultural diversity (Gay, 2002).

Additionally, implementation of the student-centric practice of voice and choice has also been shown to support the democratization of the learning experience (Morrison, 2008). Democratic education, as defined by Dewey (1903), should be grounded in principles and practices that permit learners to "take an active share in

the personal building up of [their] own problems and to participate in methods of solving them" (p. 201). Learner participation, through the intentional inclusion of student voices in the construction and modification of the learning space, can help to counteract the perceived-neutral curriculum that traditionally centers the dominant culture, and decenters diverse voices and educational practices (Stanton, 2014). These normalized approaches to learner engagement and instructional practices often undervalue, misrepresent, overshadow, and negate the educational practices and contributions by members of marginalized and minoritized communities (Bernal, 2002). Through the amplification of learners' voices, instructors validate learners' lived experiences, honor their cultural knowledge and proximity, and provide a platform by which they can contribute to the knowledge of the collective. As Ouyang et al. (2020) assert, the learning environment is thereby influenced by the cognitive, instructional, and social engagement of each of its members.

However, research suggests that learners from racial minority groups, low-income households, and/or with learning disabilities, are all less likely to receive opportunities to engage in choice within their learning environments (Evans & Boucher, 2015; Flowerday & Schraw, 2000). The constrained learner agency of disadvantaged learners is problematic, both for educational equality and social justice. Addressing this challenge is particularly imperative in the context of online learning, as this modality is increasingly utilized to provide educational access to diverse communities (Blau & Shamir-Inbal, 2018). Through cultivating educational environments in which learners' voices are validated and their choices are affirmed, instructors can support the development of individuals who recognize their importance in the global community, are confident in exercising their autonomy, and, in turn, value the perspectives of others.

Design Strategies to Promote Voice and Choice

Universal Design for Learning

Voice and choice are words that describe much of the underlying philosophy of the Universal Design for Learning (UDL) framework. UDL locates barriers to learning—not in the individual, but in the curriculum—and seeks to remove as many of those barriers as possible. It is an approach that offers all students choice in how they engage with, understand, and demonstrate learning, and one that responds to the huge variability in courses by building flexibility and accessibility into everyday teaching practice. UDL is a set of principles and guidelines for educators to design teaching and learning interactions that address the needs of the widely variable learners in our classrooms. Developed by Harvard based organization CAST in the 1990s, UDL is based on research in both neuroscience and the learning sciences. Neuroscience shows us that three key networks of the brain need to be

activated to learn effectively, and that different people need different approaches to activate them. Research in psychology and the learning sciences reinforced these findings (Rose et al., 2014), and CAST developed the UDL guidelines in response, through a dynamic, collaborative, and developmental process. In short, UDL practices seek to give learners true agency in their learning and a recognition that it's their course and *their* learning, not the instructor's or the institution's.

The foundation of UDL is to develop ways to help all students achieve success within the general education curriculum by using theories of universal design in architecture, brain-based learning, and individual learning patterns. UDL is a necessary framework due to legal mandates, and is made possible by the latest brain research, increased understanding of how learning happens, and the availability of new technologies. To meet the needs of all learners, flexibility is incorporated into the design from the start, and accessible tools and collaborative learning opportunities make education functional for a diverse group. In sum, UDL allows all students access to curriculum regardless of the unique learning needs of each individual.

In order to design effective instruction, UDL favors customizability and flexibility. Providing choices and options are critical for creating a PLE for diverse students, and also support research that shows individual learning differences are a relevant and prominent aspect of learning gains. While UDL is rooted in modern neuroscience research and the cognitive science of learning, it is also powered by the work of Lev Vygotsky, Howard Gardener, and Benjamin Bloom (CAST, 2018). By recognizing the strengths, weaknesses, and individual learning preferences of students, while also understanding how students learn through the three interconnected brain networks, instruction can be more individualized to meet the needs of each student.

Students use different parts of their brains in different ways depending on the individual and the specific learning task (Sabia, 2008). Students' individual learning differences stem from utilization of different neural network patterns: the recognition networks (the "what" of learning), the strategic networks (the "how" of learning), and the affective networks (the "why" of learning; Pisha & Coyne, 2001). These guidelines have flexibility, accessibility, voice, and choice at their core, and call on educators to respond to diversity and variability by following three core principles in the design of learning interactions (CAST, 2018):

1. Provide multiple means of engagement – the "Why" of learning (engaging the affective networks of the brain);
2. Provide multiple means of representation – the "What" of learning (engaging the recognition networks of the brain); and
3. Provide multiple means of action and expression – the "How" of learning (engaging the strategic networks of the brain).

This framework establishes UDL as: (1) a universal curriculum rather than forcing students to adjust to a general curriculum created for particular students, and (2) acknowledges the continuum of learning that exists by adjusting for the differences that occur for all students (Meyer & O'Neill, 2000). Table 1 includes voice and choice examples for each of the three principles (CAST, 2018).

Table 1 UDL examples embracing voice and choice

UDL principle	Examples
Provide multiple means of engagement	• Optimize individual choice and autonomy by allowing learners choice in how learning outcomes can be achieved. • Include flexible cooperative learning opportunities • Encourage the development of self-regulation by encouraging students to set personal goals to take ownership of their learning.
Provide multiple means of representation	• Offer a variety of strategies to present information. • Clarify vocabulary, symbols, syntax,and structure. • In providing background information ensure main points are highlighted
Provide multiple means of action and expression	• Optimize use of technology tools and assistive technologies • Included scaffolded levels of support for practice and mastery • Encourage learners to identify the type of feedback they are seeking

Designing Voice and Choice Into Online Courses

Designing a quality PLE that promotes voice and choice can be challenging (Walkington & Bernacki, 2014), and employing these strategies in online course design, especially asynchronous online design, can prove difficult for faculty and instructional designers alike. Asynchronous online courses are, ideally, designed and developed in the Learning Management System (LMS) prior to the course beginning, making it more difficult and time-intensive to employ "live" options for a more personalized learning experience. Similar to interaction and online presence, however, voice and choice activities must be purposefully designed into the course, and do not happen organically or spontaneously. Additionally, due to the time and expense of designing a high-quality online or hybrid course, a single version of a given course might be developed for multiple faculty to teach, further complicating strategies for student choice during delivery. Other online modalities, such as hybrid or synchronous, have similar barriers to employing student-centric voice and choice options. All modalities, for example, might impact instructor workload if student choice options produce such varied work that feedback and grading are more difficult.

However, attending to crucial design aspects, such as alignment, rigor, and applied activities, while simultaneously attending to equitable, inclusive, and engaged learning is achievable, and can begin with intentional curricular alignment that integrates and encourages diverse ways of knowing. If the course has pre-designed learning activities that allow for deeper practice on targeted topics, for example, students can be given the option to self-select what activities they focus on. Strategies to gauge student interest and experience with a given topic could be done via simple, planned polls or surveys that then lead to guiding students' focused learning on discrete information. For example, a survey in an English composition

course might indicate that one student needs more information on writing a good thesis, while another needs additional examples and practice with organizing an essay. Both pieces of information are prepared and built in the course, but students make self-directed choices that enable focused learning according to their needs.

Design considerations should begin with inclusivity from the start, including selecting and/or creating instructional materials and activities that are relevant, engaging, and reflective of diverse backgrounds and value systems and that incorporate learning activities framed by topics that are grounded in learners' diverse histories and experiences. Students can also be provided with various options for both formative or summative assessments, as well as aligned content, thereby promoting agency and engagement throughout the course. For example, students in a literature course might be able to choose between various novels (or nominate their own) to read and report on, all of which meet the specific requirements that align with course learning outcomes. Similarly, students in a history course could select one of several relevant historical events to explore on their own and create a peer lesson for.

Even within a given assessment that stems from the same instructional material, students could be provided a choice for how they complete a related project, including creating a presentation, writing a report, designing a multimedia piece, or working with their instructor on a unique output idea of their own creation. In all cases, be proactive about instructor workload and student equity by creating a common rubric, ensuring that all outputs are of similar effort, and all align with the learning goals/outcomes of the course. When providing choice options for assignment deliverables, also assuage potential fears by being transparent about evaluation, and whether or not creativity, for example, is part of the evaluated learning goal. For well-designed online courses that are taught by multiple instructors, also, consider a collaborative team approach, where faculty colleagues co-create dynamic online courses that provide voice and choice opportunities for both students and teaching instructors.

Preparing and Supporting Learners

When designing voice and choice into a course, it is also vital to prepare learners for this often new-to-them type of learning environment. Most learners have been socialized into a specific culture of learning, and transforming that familiar and established culture can be a difficult (and lengthy) process. So while the design itself can be challenging, students also often need additional guidance and support to engage in what can be a different learning experience than they're used to. Learner agency also serves to shift the student-instructor relationship to a partnership with a shared goal, which can also necessitate a change in teaching strategies or philosophy.

Instructors can include a video, audio, or text file to discuss voice and choice options in the course, and to openly indicate to students a willingness to support them and their diverse needs. As mentioned, recognize that this may be a very different type of learning approach and environment for students, and helping students understand the purpose of a more personalized approach, as well as how to engage with activities that promote voice and choice, can support student growth and success.

Additionally, instructors can anticipate and acknowledge potential concerns that students may have, such as how these activities will be evaluated, and whether students will be "judged" on the authentic experiences and knowledge they bring. Keep in mind that voice activities especially might ask students to be open, authentic, and vulnerable; it's vital for students to know that their authentic voice will be respected. Tactics such as designing in practice opportunities so students can receive feedback, help, and adjust their approach for deeper evaluation and reflection can be helpful. Additionally, course designs can include representative exemplars that allow students to both see varied and diverse examples, as well as provide motivation and opportunity to imagine their future, successful selves.

Once learners begin to interact with voice and choice activities, support them by providing prompt, consistent, and reassuring communication, including frequent, timely, and meaningful feedback—including assignment spacing that allows them to use the feedback. Instructors can also use live office hours or host live synchronous sessions to check in with students, help them stay organized, provide guidance, and to gain insights into barriers and progress. These are both communication strategies that foster supportive and caring learner-instructor relationships, and help to build the rapport and trust necessary for students to engage in voice and choice types of activities.

Conclusion

The concepts of voice and choice and the learner agency that are elevated within personalized learning environments are all mutually relevant and reinforcing concepts to promote equitable student learning. However, elevating these concepts within online courses must be well thought-out during the design phase. Providing students agency to increase their engagement and learning achievement through relevance, as well as to promote and provide equitable learning opportunities for all students, needs to be in the forefront of the faculty and/or instructional designer's mind as they develop their course. Additionally, instructors may need to employ different teaching strategies to support learners in completing voice and choice activities, and to also include in the design additional supportive resources, such as examples and clear assignment prompts or rubrics. Voice and choice are prominent inclusive design strategies that not only elevate learner agency, but also promote the democratization of the learning environment.

References

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1–26. https://doi.org/10.1146/annurev.psych.52.1.1

Bernal, D. D. (2002). Critical race theory, Latino critical theory, and critical raced-gendered epistemologies: Recognizing students of color as holders and creators of knowledge. *Qualitative Inquiry, 8*(1), 105–126.

Blair, D. (2009). Learner agency: To understand and to be understood. *British Journal of Music Education, 26*(2), 173–187. https://doi.org/10.1017/S0265051709008420

Blau, I., & Shamir-Inbal, T. (2018). Digital technologies for promoting "student voice" and co-creating learning experience in an academic course. *Instructional Science, 46*(2), 315–336. https://doi.org/10.1007/s11251-017-9436-y

Boyle-Baise, M., & Gillette, M. (1998). Multicultural education from a pedagogical perspective: A response to radical critiques. *Interchange, 29*(1), 17–32.

Bray, B. & McClaskey, K. (nd). Personalization vs. Differentiation vs. Individualization. Available at: https://myecoach.com/online/resources/925/PersonalizationvsDifferentiationvsIndividualization.pdf and used under a Creative Commons Attribution-NonCommerical-NoDerivs 3.0 License.

CAST (2018). UDL and the learning brain. Wakefield, MA: Author. Retrieved from http://www.cast.org/productsservices/resources/2018/udl-learning-brain-neuroscience

Clauhs, M., & Cremata, R. (2020). Student voice and choice in modern band curriculum development. *Journal of Popular Music Education, 4*(1), 101–116. https://doi.org/10.1386/jpme_00016_1

Dewey, J. (1903). Democracy in education. *The Elementary School Teacher, 4*(4), 193–204.

Emirbayer, M., & Mische, A. (1998). What is agency? *American Journal of Sociology, 103*(4), 962–1023.

Evans, M., & Boucher, A. R. (2015). Optimizing the power of choice: Supporting student autonomy to foster motivation and engagement in learning. *Mind, Brain, and Education, 9*(2), 87–91. https://doi.org/10.1111/mbe.12073

Flowerday, T., & Schraw, G. (2000). Teacher beliefs about instructional choice: A phenomenological study. *Journal of Educational Psychology, 92*(4), 634–645. https://doi.org/10.1037/0022-0663.92.4.634

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education, 53*(2), 106–116. https://doi.org/10.1177/0022487102053002003

Mercer, S. (2011). Understanding learner agency as a complex dynamic system. *System, 39*, 427–436. https://doi.org/10.1016/j.system.2011.08.001

Mercer, S. (2012). The complexity of learner agency. *Apples – Journal of Applied Language Studies, 6*(2), 41–59.

Meyer, A., & O'Neill, L. A. (2000). Beyond access: Universal design for learning. *Exceptional Parent, 30*(3), 59–61. Retrieved from: http://exceptionalparent.com/

Morrison, K. A. (2008). Democratic classrooms: Promises and challenges of student voice and choice, part one. *Educational Horizons, 87*(1), 50–60.

Ouyang, F., Chang, Y. H., Scharber, C., Jiao, P., & Huang, T. (2020). Examining the instructor-student collaborative partnership in an online learning community course. *Instructional Science, 48*(2), 183–204. https://doi.org/10.1007/s11251-020-09507-4

Pisha, B., & Coyne, P. (2001). Smart from the start: The promise of universal design for learning. *Remedial and Special Education, 22*(4), 197–203.

Rose, D., Meyer, A., & Gordon, D. (2014). *Universal design for learning: Theory and practice*. CAST Publishing.

Sabia, R. (2008). Universal design for learning and meaningful access to the curriculum. *TASH Connections*, 14–21.

Stanton, C. R. (2014). The curricular Indian agent: Discursive colonization & indigenous (dys) agency in U.S. history textbooks. *Curriculum Inquiry, 44*(5), 649–676. https://doi.org/10.1111/curi.12064

Walkington, C. & Bernacki, M.L. (2014). The Impact of a Personalization Intervention for Mathematics on Learning and Non-Cognitive Factors. Conference: Proceedings of the 7th International Conference on Educational Data MiningAt: London, UK. https://doi.org/10.13140/2.1.4342.1445

Collaborative Experiential Learning as Trauma-Informed Instructional Design

Hannah M. Grossman and Christopher Brown

As workforce professional development educators, we help adults working in youth-serving systems—such as schools and child advocacy centers—learn the knowledge and skills necessary to support the youth and families in their systems. Regardless of their specific role in these systems, these professionals need to be able to understand factors influencing a youth in their sociocultural setting, conceptualize about cross-system situations, and communicate appropriately about these complexities (Norze, 2018). Their necessary skill set also includes understanding how trauma can impact youth and the social emotional learning (SEL) skills needed to support children and families through complex times (Valenti et al., 2020).

The instructional aims for preparing these professionals are: (a) to provide low-risk places to practice complex reasoning skills (youth-serving work requires making decisions with respect to matters involving complex moral and ethical choices that have no clear right answer (Dublin et al., 2019), (b) to create opportunities for sharing and combining perspectives, so as to support communication and an integrated, holistic approach to youth services (Borden et al., 2020), and (c) to develop a trauma-informed climate with an SEL skills focus. Youth-serving professionals support people whose needs are not currently being met, and who can be sad,

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dejected, or even angry (Christensen & Rubin, 2020); professionals need SEL skills—including self-awareness, self-regulation, social awareness, and relationship skills—to assure they are helping instead of harming (CASEL, 2020).

Our design question was, "How can we create learning experiences that allow professionals to practice the subject matter and the social emotional skills to capably do their work with confidence?" Our solution is to build these skills through collaborative experiential learning. This provides peer-supported applied learning practice through the use of example dilemmas faced by youth, families, and people working in youth-serving systems. These examples furnish contextually embedded, complex interpersonal interactions that mimic the intricacies of working with real youth and families. The embedded collaborative reasoning process enables the combination of individuals' observations and prior knowledge to guide the creation of a rich shared understanding of the material. In this chapter we will discuss trauma-informed instructional design and collaborative experiential learning and how to use them to build integrative healing in the learning environment.

Approach Framework

We selected a collaborative experiential learning approach because it offers a clear process for trauma-informed instruction and, when skillfully facilitated, can provide learners a pathway towards integrative healing. By intentionally attending to complex reasoning, SEL outcomes, and communication skills, collaborative experiential learning creates low-risk places to practice the necessary skills to create a more just and equitable community—both within the learning experience and after.

Trauma-Informed Instructional Design

Broadly defined, trauma is a violation of an individual's safety, agency, dignity, or belonging (McGlynn-Wright & Briner, 2021). The width and breadth of what might be traumatic is exhaustive and differs for each individual. Every person you come into contact with is likely to have experienced traumatic occurrences of which you have no prior knowledge. Consideration of learners' potential trauma histories is important when planning instruction because our biological responses to trauma, including sleep issues, attentional problems, and difficulty controlling emotional responses can interfere with the intended academic learning. (Hertel & Johnson, 2020). Fundamentally, traumatized people devote cognitive resources to controlling and managing their reactions to their traumatic events and thus have less resources to devote to the learning process (Jones & Kahn, 2017).

The intersection of identity and trauma adds complexities to the learning environment and underscores the importance of a trauma-informed instructional lens. For example, when school officials handcuff an elementary school student of color

due to an emotional outburst in the classroom, this interaction can create a level of distrust, resentment, and disengagement that can lead to lower academic outcomes for the student. When we combine this understanding with studies that evidence disproportionate severe punishment of students of color, the systemic nature of this problem is highlighted. A particularly striking example comes from a large-scale study on the school districts in NY during the 2011–2012 school year, where, across the districts examined, 90% of the expelled students were African American and 0% were White (Crenshaw et al., 2015). These systemic traumas are easier to identify than the traumas associated with bullying, peer rejection, neurodiversity, or learning differences, but the latter are no less real. There are innumerable ways in which our learning situations themselves create and sustain traumatic stress. In our instructional design, it is best to assume learners have experienced trauma and to build from that assumption.

A trauma-informed learning environment provides a culture and climate where learners need to devote few cognitive resources to feeling safe, dignified, empowered, and included. Those cognitive resources can instead be devoted towards learning. Effective trauma-informed instruction not only creates this culture and climate, but also empowers learners to co-create and re-create this climate, collaboratively learning and improving together.

Trauma-Informed Approach in Youth-Serving Systems

What would a trauma-informed approach look like in youth-serving systems? First, a trauma-informed approach acknowledges that learners are humans coming into learning situations with previous experiences and cultural identities that influence how they experience different tasks. Each person has their own rich history, identities, and intersectionalities that influence how they perceive themselves and the world. For this reason, a trauma-informed approach involves cultural responsiveness and humility. It provides space and time for the complexities that arise from intersectionality. When students have identities related to multiple groups who have faced discrimination, they can face both challenges associated with each of those differences and challenges associated with the combination of those differences. For instance, a Latina child with a developmental disability who is being raised by a single parent must have skills to deal with the issues arising from culture, economic status, and learning differences—among other things—if she is to be successful. A trauma-informed approach must provide places to examine and reflect on these intersectionalities to understand the roles of identity and context and reason about their effects in youth-serving systems (Christensen & Rubin, 2020).

Furthermore, life in under-resourced neighborhoods comes with a host of additional problems, such as food and housing insecurity, which can add to the complexity of a youth's experience. These societal challenges can make it even more difficult for a child to be mentally present in learning situations. When surveying communities impacted by trauma, intersectionality and its correlates mean that certain

populations are impacted more frequently, more intensely, and more often by trauma (NCTSN Schools WorkGroup, in press). Unfortunately, research shows that the trauma experienced by these communities can be compounded by the very systems in which these professionals operate (Lebron et al., 2015). Thus, a trauma-informed approach must support communication and cross-systems collaboration to work against "siloing" and to develop shared understandings of youth and system needs (Borden et al., 2020).

Ultimately, a trauma-informed approach is a strength-based approach. If trauma is a violation of safety, agency, dignity, or belonging by family, friend, system, or stranger, then healing and resiliency are developed through opposite processes. The Integrative Trauma and Healing Framework summarizes, "Pathways to healing occur anytime we do anything that restores and/or promotes safety, agency, dignity, and belonging and moves bodies towards integration and wholeness." (McGlynn-Wright & Briner, 2021). The goal is to create these opportunities in the learning experience. For example, an activity that develops a sense of professional belonging can promote resiliency and help heal trauma related to lack of agency in the system. This can buffer the trauma from systemic disempowerment and reduce the likelihood of compassion-fatigue and burn-out.

Collaborative Experiential Learning as Trauma-Informed Instructional Design

Collaborative experiential learning refers to group learning situations structured using the Experiential Learning Cycle (Kolb, 2014). It involves five steps:

1. having an experience
2. communicating results and observations
3. processing by discussing, analyzing, or reflecting on the subject,
4. generalizing to connect back to real-world situations, and
5. applying what was learned to future practice.

Following these steps to work through a complex problem or example provides the low-risk practice necessary for applied learning (Yardley et al., 2012). Collaborative experiential learning is intentionally structured so that a collaborative group of individuals experiences and processes through a case, problem, or situation together. In sharing perspectives and generalizing together, they gain a deeper contextual understanding.

Collaborative experiential learning is exceptional when dealing with complex learning situations because the cycle can be iteratively applied to break seemingly insurmountable problems into manageable chunks—small, dynamic learning experiences examining narrower aspects of the larger problem. From a cognitive perspective, this reduces the interactivity of the elements while allowing learners to

explore materials in their full complexity right from the beginning, by focusing the learner's attention on particular subsets of interacting elements (Paas & Kester, 2006).

Knowing that complexity can reduce learning, professionals need the skills to deal with this complexity. Collaborative experiential learning incorporates guided facilitation, instructional tools, and discussion questions to reduce the amount of complexity being addressed at one time. Additionally, use of an example case creates emotional distance—it can feel safer to contribute reasoning around a hypothetical situation, rather than centering discussion on news events or interpersonal interactions—and thus enables more open exploration of difficult subjects.

This approach is especially beneficial when addressing complex social emotional factors that can be both sensitive to scrutinize and examine and hard to understand from a single, individual perspective. For example, discussion questions that increase awareness of how gender roles impact professionals prescribing treatment can allow for a reframing of the learner's internal conceptualization of the treatment-planning process. Places where learners from communities of color identify barriers to recovery related to identity similarly help to ensure that the whole collaborative group is better equipped to address related systemic issues in their work.

A well-structured process for combining perspectives develops a low-risk learning climate—as our views are incorporated into a larger shared understanding, it makes us feel safe and heard. As our vulnerability in sharing is accepted and welcomed, trust is developed between participants and the learning climate becomes safe. People feel belonging when others build reasoning that incorporates their perspectives. Thus, the process of combining perspectives creates a sense of community within a collaborative experiential learning group. Also, in the process of choosing information and perspectives to share, participants are empowered to prioritize identities and intersectionalities that are valuable to them. This builds agency and improves their abilities to identify and address inequities in systems. All of these factors help create the necessary culture and climate for trauma-informed instruction (SAMHSA, 2014).

Collaborative experiential learning is trauma-informed because of the supportive environment it cultivates, allowing the power of choice and creating a space that shows and promotes the value that each participatory learner has in their discipline. Being in a space where people can feel psychologically and emotionally secure frees up mental and emotional resources that would otherwise be used to protect themselves from perceived, or real, threats and reduce learning. Instead, the processes of collaborative experiential learning create a setting where people feel heard, respected, and united for a common cause—a setting that allows for integrative healing throughout the learning process. This supports all learners, but is critical to learners who have experienced trauma (Fig. 1).

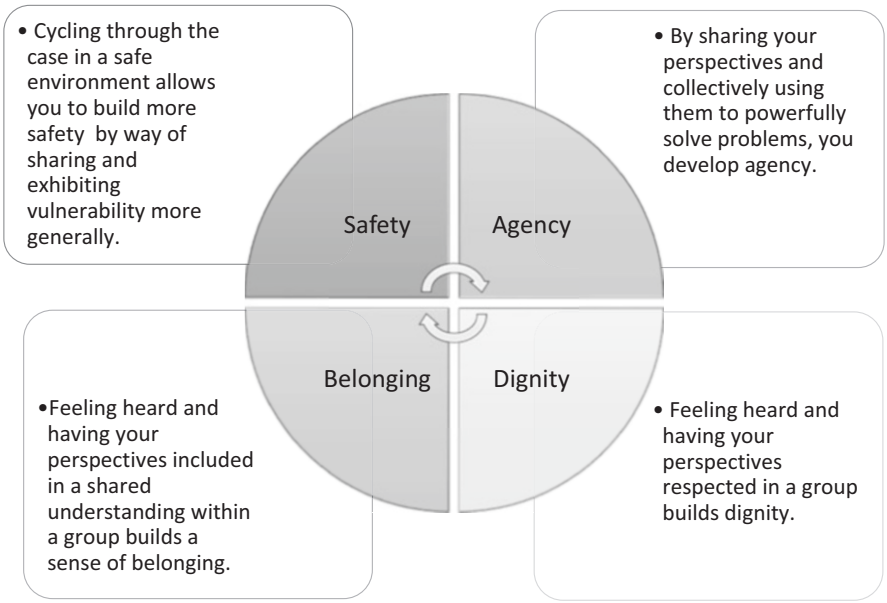

Fig. 1 How collaborative experiential learning supports resilience and healing

Collaborative Experiential Learning in Practice

The curriculum we are using as a design case of collaborative experiential learning is the Core Curriculum on Childhood Trauma, produced by the UCLA/Duke University National Center for Child Traumatic Stress and funded by grants from the Substance Abuse and Mental Health Services Administration (SAMSHA). Hannah Grossman, an author of this chapter, is the primary instructional designer of this curriculum. In collaboration with traumatic stress subject matter experts, she developed and adapted the curriculum from a medical PBL model to a collaborative experiential learning approach. To learn more about the methodology surrounding the curriculum's adaptations and development, refer to a discussion of this topic from the 2018 AECT Conference (Grossman & Layne, 2018). While the SAMSHA resources will be used in this chapter as examples of this approach, all references to "we" used in this chapter refer to the academic perspectives of both chapter authors, not of the curriculum design team.

Why Collaborative Experiential Learning?

We selected collaborative experiential learning for our curriculum because our goals were to build applied professional skills in case conceptualization, critical thinking, and the social emotional skills necessary for working with children and families. We wanted an instructional approach that would help trainees improve, practice, and apply their professional knowledge and skills to situations that closely simulate "real life" professional practice.

Youth-serving professionals often have increased exposure to trauma in their daily professional lives. To prepare for this, they must develop the skills to recognize trauma in their own worlds and strategies to manage their exposure and reactions to it. Our trainees are typically professionals in community-based mental health centers, child welfare systems, graduate and undergraduate programs, internships, and post-doctoral training programs. Their work can be pivotal in youths' lives, so we wanted to provide them practice in the complex decision-making associated with serving families and communities. The collaborative experiential learning approach provides for this practice, so that when these learners encounter similar issues in the field, they are comfortable and confident in their handling of the associated complexities (Fig. 2).

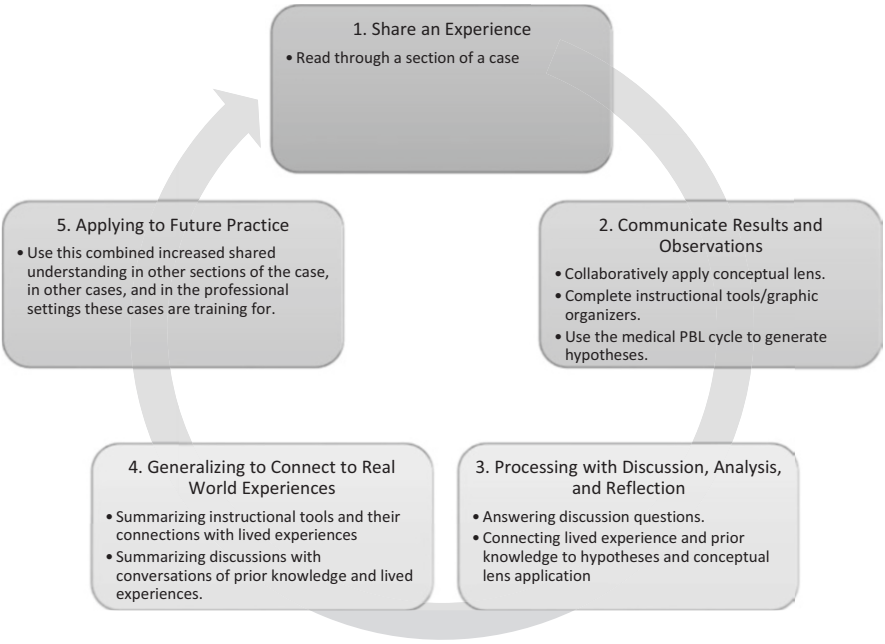

Fig. 2 The collaborative experiential learning cycle as applied in our curriculum

How Did We Apply Collaborative Experiential Learning?

Our curriculum takes identified learning objectives and aligns them with case sections as places to practice these learning objectives. We have a variety of cases representing different interpersonal situations, ages of children, cultural backgrounds, and professional perspectives. Each case is divided into sections to provide opportunities to apply general SEL professional reasoning and specific evidence-based practices and skills. Within each case section there is an instructional tool to support conceptualizing information and a discussion question to center learners' attention on critical rich points in the case material. In cycling through case sections, tools, and discussion questions, there are places to explore concepts in depth and places to generalize about a bigger picture.

The Role of the Group

Groups of learners, ideally from 4–8 individuals, process together through our example sections. They read a section and then analyze it with a tool and a discussion question. As the group works through the problem, each learner is a participant in conceptualizing the situation and co-constructing paths forward. Learners from different professional backgrounds bring in different models and conceptual frameworks. This process combines those into a greater shared understanding—it creates a common space amongst varied methods of responding to families, individuals, and trauma. Participants are able to reach more complex layers of understanding because the combined perspectives enrich each individual's understanding of the material.

The Role of Facilitators

Our collaborative groups are guided by learning facilitators. The facilitator must adroitly balance group dynamics to provide a space where all contributors have voice, agency, and an avenue to share their expertise. In addition to monitoring the social emotional process across learning, the facilitator also supports the process of information consolidation and summarization of shared knowledge. Overall, the facilitator promotes active engagement, supports the condensing of information, promotes collaboration, and promotes boundaries for safety.

Building the Social Emotional Climate for Learning One of the primary roles of a facilitator is to build the learning climate of the collaborative experiential learning situation. This should be a safe learning environment. For the purposes of our work, we define a safe learning environment as one where learners believe (and see ongoing evidence that) their perspectives are being considered, collaborators are attempting for a shared understanding, they will not be held unfairly accountable for

differences of opinion, and they will not have undue repercussions from participating in the learning experience. This is the conceptualization of safety we attempt to develop in our learning situations.

To develop this learning climate, we incorporate collaborative process guidelines and social emotional interaction goals as intended learning outcomes. All of our trainings begin with the following statement:

"In order to make the most of this learning experience, it is supportive to create a climate where people can share their perspectives. These guidelines can be helpful in the process:

1. Respect the privacy and confidentiality of the group.
2. Normalize risk-taking, hypothesis exploration, and being comfortable in the unknown.
3. Practice active listening and participation.
4. Use kindness and respect—even in disagreement
5. Be generous in your interpretation of others' perspectives.
6. The goal is to try to construct a shared understanding—look for overlapping understandings and build from there.
7. If, in the moment, conversation begins to move from these guidelines, it is appropriate to remind everyone about these guidelines and their importance in the training outcome." (Core Curriculum Interactive Learning Group, 2021).

Through setting climate goals as learning outcomes and creating a shared understanding of these goals, learners reflect on what is necessary to create a safe social emotional climate and practice the skills associated with the creation of one. As the process proceeds, the collaborative experiential learning process itself prompts community engagement and discussion, while the facilitators' role is to guide that and nurture it in a healthy and energetic way. The facilitator is responsible for ensuring, promoting, and helping to maintain the group climate and culture. Once the facilitator has created this culture, however, many groups are able to maintain, balance, and continue this dynamic with little further guidance.

Practice in Identifying and Managing the Impacts of Trauma. Facilitating in the context of the real-world complexities of our youth-serving systems inevitably includes material that has the potential to traumatize learners during the learning experience. To prevent this from occurring, and to support learning about identifying and managing the impacts of trauma it is important to do four things: (1) Prepare learners for the potentially traumatogenic nature of the material, (2) guide learners in identifying their own emotional states and emotional regulation during the learning experience, (3) provide places and processes to deal with any dysregulation that does occur, and (4) normalize the process of reflecting about the influence of trauma in youth-serving work. Building safety through reflection and shared support also helps prevent learners from being traumatized by the learning experience. These skills are necessary for professional success and personal well-being in youth-serving systems. For this reason, practice in these skills should be included as a priority learning objective.

Instructional Tools Our collaborative experiential learning sessions uses instructional tools and discussion questions to support the last three steps of the experiential learning cycle i.e., processing, generalizing, and applying to future practice. Our facilitators use these tools and discussion questions to guide learners through collaboratively processing the case material and to direct the learners to salient conceptual framings and contextual features.

Instructional tools assist the facilitator in communicating with learners about what they are collectively analyzing. They provide conceptual bins to organize example information and present this information in a graphic organizer. These instructional tools support collaborative processing because learners do not need to hold an internal mental model but instead have a shared visual representation that everyone is jointly considering. People don't need to remember what was said, they only need to look at the tool to refresh their memory.

Instructional tools support generalizing by simplifying combining information and classifying and sharing that information. The tool provides a place to contain and integrate important case factors. This eases the process of collaborative reasoning. Additionally, tools support application to future practice by serving as prompts to consider perspectives and options they might otherwise overlook. As learners continue to use the tools, they get practice in collaborative critical reasoning and can better self-assess their own reasoning processes. Within the experiential learning cycle, these tools are most used to communicate results and observations, to support analysis, and to generalize to real-world situations (Fig. 3).

Figure 3 is an example of an instructional tool to support youth serving professionals in identifying factors in a youth's life that might interact with and influence a youth's situation. In this case they identify the risk and supportive factors related

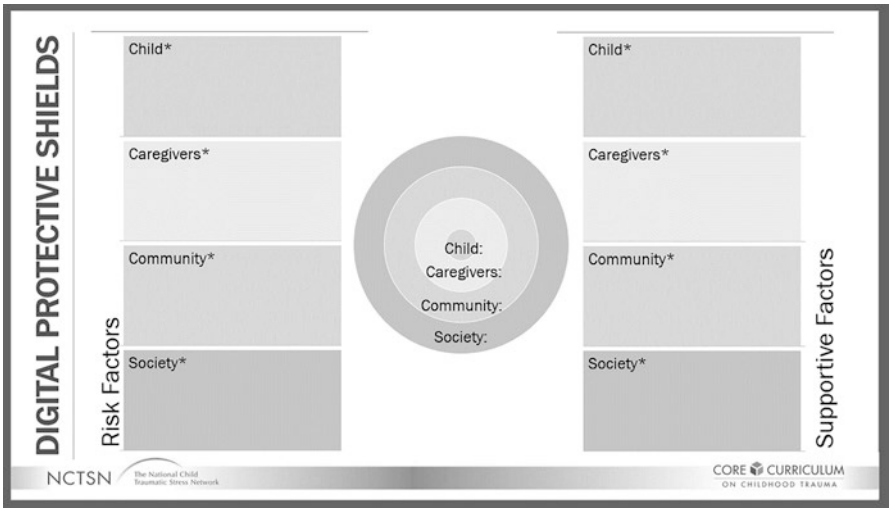

Fig. 3 An example of an instructional tool used to support collaborative experiential learning

to a youth and in their socio-cultural context. This process makes it easier to reason critically about the interrelated factors afterwards and allows individual learners to benefit from the insight and wisdom of others.

Discussion Questions Facilitators also use discussion questions to support the experiential learning cycle and explore rich points in a case. Our discussion questions provide places to develop big picture understandings, beliefs, and framings. These questions establish a place for discourse and dialogic thinking, even around topics that are often avoided because they are sensitive or complex to address. Within the experiential learning cycle, discussion questions are most used to support analysis, to generalize to real-world situations, and to re-apply to future practice.

Instructional Outcomes

This curriculum is being used in schools of social work, psychology, and psychiatry, with undergraduate populations and in child advocacy centers nationally. The process focus of the approach allows it to be adapted to fit the needs of multiple audiences in youth-serving systems. More evaluation data about learning outcomes associated with the curriculum can be found in the 2019 study by Dublin et al., "Building a trauma-informed national mental health workforce: Learning outcomes from use of the Core Curriculum on Childhood Trauma in multidisciplinary practice settings."

Concluding Thoughts

We return to the original definition of trauma we provided: a harmful violation of an individual's safety, agency, dignity, or belonging, and we acknowledge that most individuals have experienced traumatic situations in their lifetimes. Instruction, academic or otherwise, should be trauma-informed. Furthermore, as educators who train youth-serving professionals, we recognize that precautions are warranted to ensure that youth-serving systems are not adding traumatic stress to the youths and families they serve. We build these understandings and skills using collaborative experiential approaches that allow the professionals working in these systems to practice the necessary critical reasoning and SEL skills to prevent further harm. When facilitated well, these learning experiences not only provide valuable practice in important skills but also provide a space and process for interpersonal healing in collaborative learning groups.

While we have used this instructional approach with youth-serving professionals, it works with groups of all ages and in many applied learning contexts. The SEL support and process of collaboratively deconstructing a complex problem supports learners' social, emotional, and cognitive processes, and improves critical reasoning.

Provided a low-risk space in which to explore complex issues, professionals can explore how to separate bias from hypotheses and critically identify more equitable strategies to promote individuals, systems, and communities. Collaborative experiential learning offers a systematic approach to preparing for the complex, cross-system issues associated with life in an unjust world.

References

Borden, L. M., Ballard, J., Michl-Petzing, L., Conn, M., Mull, C. D., & Wilkens, M. (2020). Foundations for the future: Building an integrated, cohesive field of youth development. *Journal of Youth Development, 15*(1), 266–286.

Collaborative for Academic, Social, and Emotional Learning (CASEL). (2020). What is SEL? Available online: https://casel.org/what-is-sel/

Christensen, K. M., & Rubin, R. O. (2020). Exploring competencies in context: Critical considerations for after-school youth program staff. *Child & Youth Services, 43*, 1–26.

Crenshaw, K., Ocen, P., & Nanda, J. (2015). *Black girls matter: Pushed out, overpoliced, and underprotected.* African American Policy Forum. Retrieved from: https://www.atlanticphilanthropies.org/wp-content/uploads/2015/09/BlackGirlsMatter_Report.pdf

Dublin, S., Abramovitz, R., Layne, C. M., & Katz, L. (2019). Building a trauma-informed national mental health workforce: Learning outcomes from use of the Core curriculum on childhood trauma in multidisciplinary practice settings. *Psychological Trauma: Theory, Research, Practice, and Policy*. Advance online publication: https://doi.org/10.1037/tra0000540.

Grossman, H. M., & Layne, C. M. (2018, October). *Conducting a collaborative curriculum improvement project.* [Presentation]. AECT Annual Convention, Kansas City, MO. https://files.eric.ed.gov/fulltext/ED600552.pdf#page=28

Hertel, R., & Johnson, M. M. (2020). How the traumatic experiences of students manifest in school settings. In E. Rossen (Ed.), *Supporting and educating traumatized students: A guide for school-based professionals* (pp. 27–44). Oxford University Press.

Jones, S. M., & Kahn, J. (2017). *The evidence base for how we learn: Supporting students' social, emotional, and academic development.* Aspen Institute. Retrieved from: https://www.aspeninstitute.org/publications/evidence-base-learn/

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. FT Press.

Lebron, D., Morrison, L., Alcantara, A., Parker, G., & Mckay, M. (2015). *The trauma of racism*. McSilver Institute for Poverty Policy and Research, New York Silver School of Social Work.

McGlynn-Wright, T., & Briner, L. (2021, March 30). Integrative trauma and healing framework. *In the Works.* Retrieved from: https://intheworksllc.squarespace.com/inflections/2021/3/30/integrative-trauma-and-healing-framework

NCTSN Schools Workgroup. (in press). *Trauma-informed social emotional learning: A resource guide for educators*. National Center for Child Traumatic Stress.

Norze, J. (2018). *Building program quality in youth development staff training: Critical components as perceived by currently employed youth development professionals in the United States* (Publication No. 4634) [Doctoral dissertation, LSU]. ProQuest Dissertations Publishing.

Paas, F., & Kester, L. (2006). Teaching complex rather than simple tasks: Balancing intrinsic and germane load to enhance transfer of learning. *Applied Cognitive Psychology, 20*(3), 343–352.

Substance Abuse and Mental Health Services Administration. (2014). *SAMHSA's concept of trauma and guidance for a trauma-informed approach*. HHS Publication No. (SMA) 14-4884. Retrieved from: https://store.samhsa.gov/sites/default/files/d7/priv/sma14-4884.pdf

The Core Curriculum Interactive Learning Group (2021). Using the core curriculum to build adult SEL Skills. Los Angeles, CA, and Durham, NC: National Center for Child Traumatic Stress.

Valenti, M., Celedonia, K. L., Wall-Parker, A., & Strickler, A. (2020). Trust is essential: Identifying trust building techniques from youth providers across the service array. *Children and Youth Services Review, 117*, 105295.

Yardley, S., Teunissen, P. W., & Dornan, T. (2012). Experiential learning: Transforming theory into practice. *Medical Teacher, 34*(2), 161–164. https://doi.org/10.3109/0142159X.2012.643264

Developing an Inclusive Community in Online Programs

Yvonne Earnshaw and Mary Ann Bodine Al-Sharif

Prior to the COVID-19 pandemic, online learning was not a number one priority in higher education (Gallagher & Palmer, 2020). Just one-third of all U.S. college students had participated in an online course prior to the pandemic and institutions of higher education had typically dedicated less than 5 percent of their budgets to IT spending (Gallagher & Palmer, 2020). However, since COVID-19, higher education has changed the way it approaches virtual interactions, online classes, and student engagement (Rudalavage, 2020). According to Busteed (2021), the pandemic has shown that online learning is a viable option for college students that will require a shift to a stronger virtual infrastructure. In addition, online degree and non-degree programs may prove to be one of the few growth markets in U.S. higher education post-pandemic.

As the United States embraces this digital learning transformation, it will be important for a strong infrastructure to be put into place along with "regulation that is attentive to quality assurance, but that also encourages innovation" (Gallagher & Palmer, 2020, para. 13). Part of that innovation must include the way in which higher education works to build an inclusive community within the online campus environment (Schroeder, 2020). In defining inclusivity in an online format, Schroeder (2020) suggests higher education examine several aspects of their online offerings including entrance requirements, promotional materials, on-ramping for those who do not meet initial entrance requirements, support for affordable access to high-speed broadband, and creating "a comfortable and inviting – not divisive or

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demanding – atmosphere where all students are valued, and their views are included" (para. 7). *Inclusion* can be defined in both narrow and broad terms depending upon the focus of the work. For the purposes of our research, we are defining inclusivity as an ongoing and transformative process meant to improve educational environments so that all students, especially those of marginalized and minoritized identities, are both accepted and have their educational needs met. Therefore, the purpose of this study is to discover how an effective inclusive virtual community is created within online programs. Specifically, through a case study of two online programs, we will investigate what makes students feel included in an online learning community.

Literature Review

Institutions need to be proactive and intentional in how they build their online infrastructure in order to retain students (Sorenson & Donovan, 2017; Travers, 2016). Online students may never physically come to campus, so they may be unaware of the student support services available to them (Heyman, 2010). Unfortunately, they may also feel like they are not a part of the institution, which can contribute to feelings of isolation and alienation (Rovai, 2003; Rovai & Whiting, 2005). Developing an inclusive community for online students so they do not feel disconnected from others is important (Slagter van Tryon & Bishop, 2009). In the following sections we will discuss ways in which an inclusive community can be built based on best practices within higher education (American College Personnel Association [ACPA] & National Association of Student Personnel Administrators [NASPA], 2010; Association of College and University Educators [ACUE], 2021) and instructional design (Martin et al., 2018; Pittman & Heiselt, 2014; Trespalacios & Perkins, 2016).

Getting to Know Your Students

Faculty and program directors must know who each of their students are and their unique situations in order to create an inclusive online community (ACUE, 2021). In an online program, students need to have access to a stable high-speed internet connection and equipment. The students may also be full-time working adults who are completing coursework in the evenings and on weekends. They may be local, out-of-state, or abroad. They may be living in rural or urban areas. Their time zones may vary based on locations across the United States and abroad. Location matters and can be an indicator of how and when communications and virtual interactions must occur. If we do not assess these items, we may assume that a 4:00 p. m. CT synchronous session will work for all our students when in reality it does not.

Creating an Inclusive Online Community

Creating an inclusive online community needs to be purposeful so students do not feel disconnected from one another (Slagter van Tryon & Bishop, 2009). The inclusive online community can be approached in multiple ways including from a digital inclusion angle (Pittman & Heiselt, 2014), recognizing the students' social constructs of identity (ageism, ableism, etc.) (ACPA/NASPA, 2010), and designing the course and program to meet the needs of all students (Martin & Bolliger, 2018). Some of the students may be first generation students or may have been out of school for several decades. Hosting a required online orientation would be beneficial to set the expectation of what the program will include but also to share information about resources that are available to online students (Rose, 2016). Students need to know that the online environment will support their educational endeavors and them as individuals (Richardson et al., 2012).

Faculty play a key role in creating the structure, providing opportunities for engagement, and fostering non-academic communication (Dhami, 2020). Dhami (2020) noted that there are five steps faculty can take to support an online learning community. First, courses must be designed to meet students' needs while also giving them voice in some decision making for course structure and processes. Second, faculty must establish an authentic presence by humanizing the curriculum and themselves. Third, faculty must encourage conversations both in and outside of the classroom. Fourth, faculty must build opportunities for students to learn from one another through small group interactions in breakout rooms and other collaborative learning activities. Fifth, faculty must create virtual spaces outside of the classroom to foster non-academic communications through social media such as a Facebook page or group, Twitter hashtag, LinkedIn group, and the like.

Assessing the Program

Assessment is an important aspect in creating a successful online community. As educators, we need to know what is working and what needs further development (ACPA/NASPA, 2010). This can only be accomplished through continual assessment of student performance (Palloff & Pratt, 2009) and engagement (Conrad & Openo, 2018). Assessment should incorporate the use of rubrics, surveys, and student and faculty feedback (Conrad & Openo, 2018). According to Conrad and Openo (2018), assessment should be seamlessly integrated into all aspects of the online program.

Theoretical Framework

Garrison's Community of Inquiry (CoI) framework is a model for online education that focuses on dialogue, interaction, and collaboration (Garrison et al., 2000). One factor that is associated with CoI is having a sense of community (Garrison & Arbaugh, 2007). Creating this sense of community comes from the engagement between students, instructors, and the content (Scoppio & Luyt, 2017) and can be found through a variety of ways including through synchronous online orientations (Cho, 2012; Rose, 2016), connecting students with campus support services (Russo-Gleicher, 2013; Stewart et al., 2013), peer knowledge sharing (Waycott et al., 2013), active discussions in the courses where students can share personal experiences (Barry, 2017; Shackelford & Maxwell, 2012; Trespalacios & Perkins, 2016), and having diverse technological tools (Barry, 2017; Delmas, 2017). Having these infrastructures in place will enable students to feel more connected to each other (Moore, 2014).

Methodological Approach

We have selected to use case study as our methodology for this study. Case study as a research methodology investigates a phenomenon within its real-life context and provides a descriptive and exploratory analysis of a community, group, or event (Yin, 2018). Case studies rely on multiple sources of evidence that can be collected through, for example, interviews, observations, documents, and field notes. Case study was the appropriate choice for our research because we seek to gain insight on how students define an effective inclusive online community within online programs. Therefore, we collected our data through interviews, observations of the online course platform, assignments, and other virtual spaces where students are directed for assistance, socialization, and support.

Research Team

The two authors served as a research team to create a systematic approach to the research process and triangulation for the data analysis (Schwandt, 2007). At the time of the study, both faculty members were working at an R1 institution in the Southeastern region of the United States. The first author is currently serving as an assistant professor and has been a program coordinator in an online master's level program. She has been involved in online learning for over 20 years as a higher education student, course designer working with faculty who were transitioning their courses online, and faculty member who has taught online for several universities. Her academic and professional background as an instructional designer/

developer helps guide her need to be inclusive, especially in online classes where students may feel isolated for several reasons. She advocates for students and strongly believes in building community in the graduate program she directs. The second author for this study identifies as a white, cisgender, Muslim American, womxn. For over 13 years, she has worked in a variety of roles within higher education (professional practitioner, administrator, and faculty). Currently, she serves as a program coordinator and assistant professor in an online master's level program. She has been teaching in the online format for 10 years and is familiar with several online platforms for course delivery. Her research work centers on issues of social justice within higher education.

Reflexivity

Reflexivity is a form of critical self-reflection conducted by the researchers to control bias (Schwandt, 2007). The researchers are an active part of the research; therefore, to control for bias within the study, they created a consistent plan of action for data collection, analysis, and triangulation. They were in constant consultation with one another as data were collected, analyzed, and reported. Inferences were then gathered from multiple data sources (Schwandt, 2007).

Participant Selection

This study used purposive sampling to identify participants (Patton, 2002). Purposive sampling is the intentional selection of participants based on their ability to explain a specific phenomenon due to their relationship/experience with the phenomenon. Specifically, we selected participants who were students in two fully online graduate programs within a school of education at an R1 institution in the Southeastern region of the United States. A total of 11 participants agreed to be interviewed for the study (see Table 1).

Data Collection

The researchers emailed all current master's and graduate certificate students in two fully online degree programs inviting them to participate in this study. The email included information about the purpose of the study, qualifications to participate, as well as a Qualtrics link they could select to provide implied consent to participate in the study and provide initial demographic information. Sixteen participants completed the questionnaire and provided contact information to set-up an interview. Eleven participants were able to be contacted via phone or Zoom for an interview

Table 1 Participant Identifiers

Participant pseudonym	Gender identity	Sexual orientation	Race/ Ethnicity	Program 1 or 2	MS or Grad. Certificate	Age	Semesters in program	Work at study institution
Rosie	F	H/S	W/EA	1	MS	38	2	N
Trisha	F	H/S	W/EA	2	MS	43	3	Y
Jade	F	H/S	B/AA	1	MS	41	4	Y
William	M	S-GL	B/AA	1	MS	31	5 or more	Y
Whitney	F	H/S	B/AA	2	MS	31	3	Y
Tristan	DN/ID	G	W/EA	2	MS	25	3	Y
Michelle	F	H/S	B/AA	2	GC	36	3	Y
Lisa	F	H/S	B/AA	2	GC	54	3	Y
Alyssa	F	H/S	B/AA	1	MS	44	2	Y
Olivia	F	H/S	W/EA	1	MS	53	2	N
Jordin	F	H/S	B/AA	2	MS	25	3	Y

Note. DN/ID = Does not identify as female, male, or transgender, H/S = heterosexual/straight, S-GL = Same-gender loving, G = Gay, B/AA = Black/African American, W/EA = White/ European American

within 2 to 3 weeks. The researchers conducted the interviews using fourteen semi-structured interview questions (Schwandt, 2007) that focused on access to technology, interactions with classmates and faculty, students' sense of belonging, community building, and inclusivity. Interviews lasted no more than 1.5 hours and were transcribed using transcription software.

The researchers also obtained access and observed the set-up of two classes within each of the two programs. Access was given to *sandbox* classes in the learning management system. Sandbox classes are the initial shells for a class that have been created and then will be copied to the actual live course. By accessing sandbox classes where no students are enrolled, researchers were able to maintain FERPA guidelines for privacy of all students who might be enrolled in these two programs. FERPA is a federal law that protects the privacy of student education records (U.S. Department of Education, 2020).

Through the sandbox courses, we were able to identify different ways in which students are interactively collaborating on course projects and provided spaces for discourse through discussion board postings. In addition, the researchers were able to review the two programs' websites and recruitment materials, as well as social media sites and a program resource online repository.

The researchers were the only people with access to the data. Throughout the study, the researchers stored all data on a password-protected computer in a secured office. Participants were assigned pseudonyms to protect their identities. No data were collected through email. Email correspondence was only used to recruit participants, provide the Qualtrics link, and set the initial appointment for interviews. All documents were saved using participants' assigned pseudonyms to maintain confidentiality for participants.

Data Analysis

The researchers used thematic analysis to analyze the data collected. Thematic analysis is a method "for identifying, analyzing, organizing, describing, and reporting themes found within a data set" (Nowell et al., 2017, p. 2). Through thematic analysis, researchers can identify relevant themes and subthemes to explore the meanings associated with emerging concepts (Braun & Clarke, 2006; King, 2004; Nowell et al., 2017). For the purposes of this study, we analyzed the set-up and content of sandbox courses, the content of websites, orientation materials, recruitment materials, and participant interviews from students enrolled in the two graduate programs.

Findings

The overarching theme that continued to arise from our work was that of intentionality. Our findings suggest that creating an inclusive online community starts with the construction of an inclusive environment which requires a great deal of intentionality by the program faculty. Our study revealed specifically the importance of being intentional in creating program assessment, infrastructure, and most importantly, engagement through dialogue.

Intentionality of Program Assessment

We found that assessment is key to success in creating an inclusive online community. While our review of the sandbox courses showed that faculty had aligned their program and course objectives with their learning outcome assessments (i.e., assignments, discussion boards, exams, portfolios, thesis research, and the like), it also showed that faculty had built in more personal forms of assessment to address the whole student. Michelle noted,

> She would do mid semester check-in. And I think that definitely was unheard of for me. And I thought like, what Professor calls students to check on them, but I always appreciated it. [She called] I think twice. ... [There is also] an optional assignment. You can complete it if you want. … You don't necessarily get any points, but it helps [to assess and] kind of make the program better. So, I've always completed them. ... It's an email to let you know, hey, don't forget your mid-semester check-ins are coming up, feel free to complete this form if you'd like to. And then also, I'll be calling around to let you know. So, if you received a missed call from this number, and then the phone call. Yeah, so it's sort of a multi-tier, just at, you know, the mid-point … and she genuinely cares. I mean, you know, we get someone who is [asking] 'Hey, are you okay? Is there something we need to do?'… [She] is always keeping a finger on the pulse of what's happening with the students during that given class in any given semester.

Faculty displayed a genuine ethic of care through assessment. Both the phone calls and the mid-semester check-in made students feel like they had a voice in their own academic journeys and that they belonged in the program.

Intentionality of Course Infrastructure

Structurally, faculty had created a welcoming online environment for their students. Sandbox courses used the same template throughout the respective programs to create consistency. Learning objectives were defined in both course syllabi and weekly modules. In addition, the texts chosen represented diverse authors and perspectives. One program had a separate sandbox for program resources, which included a listing of books used in the program along with other books, websites, and podcasts important to the field, recorded town hall (guest speaker) sessions, the program handbook, and slides from the new cohort orientation. The other program used a specific resource space/folder within each course to store handbooks, resources, additional readings, and a safer space agreement that had been collectively created by the cohort and posted in each course shell. Michelle stated,

> At the beginning of every semester, [the professor] goes through … a safer space agreement. And I think that setting that foundation for me was really important because we all understood or knew the expectation. So, even when we had heated discussions … I still felt as though there was a sense of community there.

Trisha concurred,

> My professor … had us set up, basically some ground rules like what the safer space is. ... How are we going to be as a community. ... So, having all of that set up beforehand, I think has been really helpful for us to talk about some really tough topics.

In addition, course syllabi also included additional resources for students (i.e., references to the writing center, LGBTQIA+ support, mental health, career center, disability support services, and the like). Tristan shared that his faculty included language and resources within the syllabus that made him feel included. He noted,

> I've never had a professor do what [the professor] has with her syllabus, where [the professor] includes loads of resources, and a lot of those, so as a queer person myself, there are several resources on there specifically for queer people. And I was really surprised to see that, but I felt very included because of that, and I appreciated it and wish that I'd had it when I was an undergrad.

The program faculty had structured the circumstances that allowed inclusivity to evolve within the online environment by proactively anticipating how difficult conversations over course materials would be addressed, through consistency of organization in formatting the course shells, and by providing additional resources that would promote well-being and success.

Intentionality of Engagement Thru Dialogue

The greatest impact on inclusivity revealed by this study was the active role of the program faculty in creating intentional spaces for engagement through dialogue. Rosie discussed how her professor created a team environment amongst her cohort. Rosie appreciated the variety of individuals that she was paired with for assignments and how her professor had created an environment that mimicked the profession they would all move into. She said,

> I think [the professor] has done an amazing job with harboring a sense of team unity and facilitating to where it mimics what the field is like outside of academia where we are working in teams or with a partner. … I've never been paired with the same person twice, and it's not a huge program. ... So, it's allowed me to get to meet each one of my classmates on a more individual level. ... I honestly think I've gotten to know these classmates better than I would have if we were in a [face-to-face] classroom.

Whitney recognized the importance of her faculty's approach through dialogue with individuals in the cohort. She noted that the faculty often fostered inclusivity through affirmative language. She shared,

> I appreciate when our professor steps in and says, 'Hey, well, let's look at it from this point of view, or let's look at it from – I do appreciate, you know, I acknowledge that you've stated x, y, z, but let's try to look at it from the lens of this way.' … I do think that the teaching methods, the inclusive teaching methods, by her [the professor] allowing or her steering those conversations and then allowing the students to then provide their input. I believe that this not only engaged but supported the students' learning or supported us in learning to understand the different backgrounds [of each other].

Faculty were consistently engaged with their students through dialogue which allowed them to better understand the whole student and what was going on in their lives both in and outside of the classroom. Jordin shared,

> I think what has helped make it an inclusive environment is her grace and her understanding knowing we are working and trying to balance school. And so, if we don't turn an assignment in on time, it's not because we're not committed to the course. It's just that time doesn't allow. And so, like that feels more inclusive because she's respecting our professional identity, as well. So, you really can't ask for much more than that.

Jordin recognized that her faculty saw her as more than just a student in her class, but as an individual with multiple identities and responsibilities. Allowing her grace to turn in a late assignment when she was overwhelmed with all her responsibilities let Jordin know that she was seen and understood.

Discussion

Creating an inclusive online community requires a great deal of intentionality by the program faculty. Participants confirmed the importance of intentionality and purposefulness in creating or structuring an inclusive environment for student

connections to occur that sets the foundation for an inclusive community to evolve (Slagter van Tryon & Bishop, 2009). Participants also confirmed the importance of faculty understanding who their students are and supporting students' unique and individual needs (ACPA/NAFSA, 2010; ACUE, 2021). Engagement between students, instructors, and the content is vital to creating a sense of community (Scoppio & Luyt, 2017), but there is a great deal of intentionality needed for inclusivity to evolve within the online community. Faculty must recognize and embrace the importance of assessing more than just intended learning outcomes. They must assess the needs of the whole student. Faculty must also provide structures that recognize the whole student and student experience, as well as foster purposeful engagement through dialogue with their students.

Our results have implications for instructors who teach online, especially for those looking for ways to promote a sense of community (Garrison & Arbaugh, 2007) and inclusivity. As part of the goal of increasing teaching presence (Shea, Li, Pickett, 2006; Shea, Li, Swan, Pickett, 2005), instructors have the responsibility to design, organize, and most importantly engage in the online environment to facilitate collaborative communities of inquiry (Richardson et al., 2012). Our research clearly confirms Bolliger and Martindale's (2004) notion that the most important element in online learning is the instructor. Setting up the proper infrastructures within the online classroom will provide an inclusive environment or context for community to evolve, but without the intentional engagement of the faculty to model and set the expectations for interactions, the inclusive community may not fully develop.

Conclusion

Creating an inclusive online learning community takes a lot of effort and faculty must be dedicated to the work to be done. Our study shows that active and engaged faculty are key to inclusivity in the online environment. They hold the responsibility of creating structures, resources, and opportunities for engagement both within and outside of the classroom. Their role cannot be underestimated. Future research should focus specifically on the role of faculty in the online environment, and further investigate the best practices for fostering inclusive online course structures. In addition, research is needed on how administrators can best support online faculty in creating inclusive communities.

References

American College Personnel Association & National Association of Student Personnel Administrators. (2010). *ACPA/NASPA professional competency areas for student affairs practitioners*. https://www.naspa.org/images/uploads/main/ACPA_NASPA_Professional_Competencies_FINAL.pdf

Association of College and University Educators. (2021). *ACUE 10 inclusive teaching practices.* https://acue.org/inclusive-teaching-practices-toolkit/

Barry, S. (2017). Building community in online doctoral classrooms: Instructor practices that support community. *Online Learning, 21*(2), 42–63. https://doi.org/10.24059/olj.v21i2.875

Bolliger, D. U., & Martindale, T. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-learning, 3*(1), 61–67.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*, 77–101. https://doi.org/10.1191/1478088706qp063oa

Busteed, B. (2021). The future of higher ed fundraising: Building the virtual campus. *Forbes*. https://www.forbes.com/sites/brandonbusteed/2021/03/16/the-future-of-higher-ed-fundraising-building-the-virtual-campus/?sh=4d9071fe3f69

Cho, M.-H. (2012). Online student orientation in higher education: A development study. *Educational Technology Research and Development, 60*, 1051–1069. https://doi.org/10.1007/s11423-012-9271-4

Conrad, D., & Openo, J. (2018). *Strategies for online learning: Engagement and authenticity*. AU Press.

Delmas, P. M. (2017). Using VoiceThread to create community in online learning. *TechTrends, 61*(6), 595–602. https://doi.org/10.1007/s11528-017-0195-z

Dhami, H. (2020, May 12). 5 tips for creating a true online learning community. *Top Hat*. Retrieved from: https://tophat.com/blog/online-learning-community/

Gallagher, S., & Palmer, J. (2020). The pandemic pushed universities online. The change was long overdue. *Harvard Business Review*. https://hbr.org/2020/09/the-pandemic-pushed-universities-online-the-change-was-long-overdue

Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and Higher Education, 10*, 157–172. https://doi.org/10.1016/j.iheduc.2007.04.001

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2–3), 87–105. https://doi.org/10.1016/S1096-7516(00)0016-6

Heyman, E. (2010). Overcoming student retention issues in higher education online programs. *Online Journal of Distance Learning Administration, 8*(4). http://www.westga.edu/~distance/ojdla/winter/134/heyman134.html

King, N. (2004). Using templates in the thematic analysis of text. In C. Cassell & G. Symon (Eds.), *Essential guide to qualitative methods in organizational research* (pp. 257–270). Sage.

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning, 22*(1), 205–222. https://doi.org/10.24059/olj.v22i1.1092

Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement, and learning in online courses. *The Internet and Higher Education, 37*, 52–65. https://doi.org/10.1016/j.iheduc.2018.01.003

Moore, R. (2014). Importance of developing community in distance education courses. *TechTrends, 58*(2), 20–24. https://doi.org/10.1007/s11528-014-0733-x

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*. https://doi.org/10.1177/1609406917733847

Palloff, R. M., & Pratt, K. (2009). *Building online learning communities: Effective strategies for the virtual classroom* (2nd ed.). Jossey-Bass.

Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Sage.

Pittman, C. N., & Heiselt, A. K. (2014). Increasing accessibility: Using universal design principles to address disability impairments in the online learning environment. *Online Journal of Distance Learning Administration, 17*(3), 1–11. https://www.westga.edu/~distance/ojdla/fall173/pittman_heiselt173.html

Richardson, J. C., Arbaugh, J. B., Cleveland-Innes, M., Ice, P., Swan, K. P., & Garrison, R. (2012). Using the community of inquiry framework to inform effective instructional design. In L. Moller & J. B. Huett (Eds.), *The next generation of distance education: Unconstrained learning* (pp. 97–125). Springer.

Rose, J. R. (2016). *Studying the influence of an online student orientation on students' resource awareness and utilization* (Publication No. 10250650) [Doctoral dissertation, University of Delaware]. ProQuest Dissertation and Theses Global.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *The Internet and Higher Education, 6*(1), 1–16. https://doi.org/10.1016/S1096-7516(02)00158-6

Rovai, A. P., & Whiting, M. J. (2005). Feelings of alienation and community among higher education students in a virtual classroom. *The Internet and Higher Education, 8*(2), 97–110. https://doi.org/10.1016/j.iheduc.2005.03.001

Rudalavage, C. (2020). *Will campus life translate to a virtual environment?* Gensler. https://www.gensler.com/research-insight/blog/will-campus-life-translate-to-a-virtual-environment

Russo-Gleicher, R. J. (2013). Qualitative insights into faculty use of student support services with online students at risk: Implications for student retention. *Journal of Educators Online, 10*(1), 1–32. https://files.eric.ed.gov/fulltext/EJ1004894.pdf

Schroeder, R. (2020). *Thoughts on creating an inclusive environment in online classes*. Inside Higher Ed. https://www.insidehighered.com/digital-learning/blogs/online-trending-now/thoughts-creating-inclusive-environment-online-classes

Schwandt, T. A. (2007). *The sage dictionary of qualitative inquiry* (3rd ed.). Sage.

Scoppio, G., & Luyt, I. (2017). Mind the gap: Enabling online faculty and instructional designers in mapping new models for quality online courses. *Education and Information Technologies, 22*(3), 725–746. https://doi.org/10.1007/s10639-015-9452-y

Shackelford, J. L., & Maxwell, M. (2012). Sense of community in graduate online education: Contribution of learner to learner interaction. *The International Review of Research in Open and Distance Learning, 13*(4), 228–249. https://doi.org/10.19173/irrodl.v13i4.1339

Shea, P., Li, C. S., & Pickett, A. (2006). A student of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *The Internet and Higher Education, 9*, 175–190. https://doi.org/j.iheduc.2006.06.005

Shea, P., Li, C. S., Swan, K., & Pickett, A. (2005). Developing learning community in online asynchronous learning networks. *Journal of Asynchronous Learning Networks, 9*(4), 59–82. https://doi.org/10.24059/olj.v9i4.1779

Slagter van Tryon, P. J., & Bishop, M. J. (2009). Theoretical foundations for enhancing social connectedness in online learning environments. *Distance Education, 30*, 291–315. https://doi.org/10.1080/01587910903236312

Sorenson, C., & Donovan, J. (2017). An examination of factors that impact the retention of online students at a for-profit university. *Online Learning, 21*(3), 206–221. https://doi.org/10.24059/olj.v21i3.935

Stewart, B. L., Goodson, C. E., Miertschin, S. L., Norwood, M. L., & Ezell, S. (2013). Online student support services: A case based on quality frameworks. *MERLOT Journal of Online Learning and Teaching, 9*(2), 290–303. https://jolt.merlot.org/vol9no2/stewart_barbara_0613.pdf

Travers, S. (2016). Supporting online student retention in community colleges. What data is most relevant? *Quarterly Review of Distance Education, 17*(4), 49–61.

Trespalacios, J., & Perkins, R. (2016). Sense of community, perceived learning, and achievement relationships in an online graduate course. *Turkish Online Journal of Distance Education, 17*(3), 31–49. https://doi.org/10.17718/tojde.12984

U.S. Department of Education. (2020). *Family Educational Rights and Privacy Act (FERPA)*. https://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Waycott, J., Sheard, J., Thompson, C., & Clerehan, R. (2013). Making students' work visible on the social web: A blessing or a curse? *Computers & Education, 68*, 86–95. https://doi.org/10.1016/j.compedu.2013.04.026

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.).

Knowledge Sharing for Inclusive Learning

Megan R. Alicea

The twenty-first-century culture of learning has transitioned from the knowledge dispensing teacher to a contextualized, social, more humanistic approach. Teachers and learning designers must consider the need to humanize learning while recognizing the history of dehumanization in education (Freire et al., 2018). A review of popular instructional design models demonstrated the need for greater consideration of inclusivity in our design practices (Heaster-Ekholm, 2020). Learning design is not neutral. The design creator's cultural background, interests, and world views manifest in the design. Frameworks presented as "culturally inclusive" even express bias in their design (Gunawardena, 2020).

Inclusivity goes beyond accessibility. Inclusive learning should also be relevant and engaging for all learners (Thomas & May, 2010, p. 5). To move toward inclusivity is to migrate away from the hierarchical tradition of the teacher delivering all knowledge with students present only as empty receptacles. Treating students as passive objects to accept whatever knowledge is delivered to them is a dehumanizing approach to learning (Freire et al., 2018). This banking metaphor is often used to support a social constructivist approach to learning. However, there are distinctions to make between constructivism in education and knowledge sharing for the creation of new knowledge. Knowledge sharing for education is still viewed through the business lens to capture the innovative intentions. In other words, knowledge is produced for use and continued innovation in the real world rather than a project that may not have any authenticity or consequence outside of the classroom.

Toward Inclusive Learning Design: Social Justice, Equity, and Community
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Knowledge sharing results in transformative learning "which involves acquiring new perspectives, with long-term consequences on a learner's growth" (Gunawardena et al., 2019, p. 280).

Inclusive learning not only meets the needs of a diverse population, but this diversity is valued. Knowledge sharing is defined as a "process where individuals mutually exchange their (implicit and explicit) knowledge and jointly create new knowledge" (van den Hooff & de Ridder, 2004, p. 118). Knowledge sharing activities require involvement with various levels of interdependence (Appel-Meulenbroek et al., 2018). Knowledge sharing in the learning context has potential to involve all learners in the knowledge creation process for a humanizing, inclusive approach.

In the business domain, the goal of knowledge sharing is advancement of company knowledge. In the educational context, knowledge sharing should be responsive to the individual if learning is to be inclusive. Students enrolled in the same class do not automatically translate into students with similar interests and goals. There should be a focus on creating a space for each individual learner. Inclusive learning enables learners to (1) connect to a relevant area of interest, (2) receive and make authentic contributions to the area of interest, and (3) feel cared for and supported throughout the process. The care and support provided are necessary components as this addresses the diversity of the group, especially by supporting learners unaccustomed to or with differing values regarding being an active member and contributor of knowledge in the learning environment. The purpose of this literature review is to investigate how knowledge sharing activities align with the three C's (i.e., Connection, Contribution, and Care) of inclusive learning.

Conceptual Framework

Sense of belonging has been used as a measure of inclusivity (Metzger & Taggart, 2020). Inclusive learning should result in a sense of belonging and mattering for all learners as they find relevance and the empowerment to engage and contribute in meaningful ways. *Inclusive learning* is defined here as a space where the learner is making connections to find relevance for the self, feeling empowered to engage by receiving and making contributions to an area of interest, and feeling cared for and supported throughout the process. This definition stems from identified themes in the literature demonstrating connection, contribution, and care as important constructs of belonging and mattering (Grobecker, 2016; Strayhorn, 2019; Vaccaro & Newman, 2016).

Connection, Contribution, and Care

The meaning of belonging has transitioned in the literature from "fitting in" to a "feeling of connectedness" (Strayhorn, 2019). This transition comes from the recognized importance of authenticity in belonging. Belonging is not about a perceived likeness to others or someone altering their actions or appearance for the sake of "fitting in" with others in a group, but an individual belonging in a space as their true authentic self (Strayhorn, 2019, p. 9). It is important to acknowledge "everyone feels a need to belong, to matter, to be accepted by others (even at the expense of self sometimes)" (Strayhorn, 2019, p. 16). Belonging is connecting without feeling the need to alter or hide your true self and the development of authentic connections (Vaccaro & Newman, 2016). This connection is described as a feeling of mattering to others (Strayhorn, 2019). For learning design purposes, we must define "others." Connections are not confined to the others in the classroom. The process of making connections is a method of contextualizing the space in meaningful ways for the individual.

Feeling connected generates a sense of belonging and the empowerment to engage and contribute (Strayhorn, 2019). The inclusive knowledge sharing space humanizes the learning process with a focus on the strength and value of diverse contributions. Belonging is relational, where individuals both receive and make contributions (Strayhorn, 2019). In addition to connection and contribution, perceived support, and respect (i.e., feeling someone cares and wants you to succeed) contributes to a sense of belonging (Vaccaro & Newman, 2016). The inclusive knowledge sharing space opposes the deficit stance and seeks only possibilities. This narrative review seeks to bring those possibilities to life by connecting knowledge sharing activities in the literature to these concepts of connection, contribution, and care for an inclusive design approach.

Theoretical Connection – Human Needs

Humans cannot expend time and energy on learning without first meeting basic physiological needs (i.e., food, water, sleep) (Maslow, 1954). Beyond their physiological needs, humans focus on safety. It is often understood how performance suffers when students are hungry, tired, or unsafe. The human need to belong is not considered as often yet must be attained before learners can focus on reaching their performance goals. Without meeting the human need to belong, students will not succeed in learning, and performance will suffer. College students may not even stay in college if the need to belong is not met (Strayhorn, 2019). Sense of belonging in the learning environment influences outcomes in mental health, self-esteem, and social functioning in society (Hagerty et al., 2002). Belonging relates to meeting the fundamental human need to matter in terms of competence, autonomy, and relatedness. "The degree to which these needs are fulfilled within a context predicts

motivation, engagement, and performance in that context" (Zumbrunn et al., 2014, p. 663). Social and emotional learning efforts for inclusion demonstrate how a lack of connectedness negatively impacts cognitive processing abilities and academic performance (Durlak et al., 2011; Osher et al., 2016). Research for inclusive learning design is not only important for social and emotional well-being, but also for improving learning and performance.

Knowledge Growth and Connected Cultures

Local connections and support no longer meet the needs of this knowledge-driven society. Technology has enabled people from all over the world to connect for problem solving and innovation. This begets immense concerns in education, including keeping up with the rapid growth and complexity of knowledge and supporting greater diversity in the populations working together. How can learners be prepared for this "age of accelerations" (Friedman, 2017) and how can each learner play a role in the acceleration of knowledge with meaningful contributions? Knowledge sharing activities in education may play a role in addressing these concerns.

Knowledge Sharing Activities for Connection

Berends (2005) created a taxonomy of knowledge sharing moves which are divided into five categories: descriptions, suggestions (proposals), evaluations, questions, and actions (demonstrating a process). These categories can be scaled by level of interdependent involvement. For example, description activities require less interdependent involvement than the other collaborative categories (Appel-Meulenbroek et al., 2018). Despite the expected higher level of interdependent involvement in the collaborative categories, they did not result in more tacit knowledge sharing when compared to the lower involvement category of descriptions (Appel-Meulenbroek et al., 2018). However, the mediator of having shared problems (or shared goals) did relate to more tacit knowledge sharing and more interdependent involvement. This demonstrates how knowledge sharing activities surrounding a shared problem or goal produce more tacit knowledge sharing and interdependent involvement than activities without a shared problem or goal. These results align with the connections needed for inclusive learning. The shared problem or goal, connected to the individual's interests, is at the heart of the inclusive knowledge sharing space. Finding this connection is not using a predetermined problem or goal set by the teacher. As previously mentioned, making connections is a method of contextualizing the learning space in meaningful ways for the individual. But first, this learning space must be defined.

Defining the Learning Space

To create a space for individually meaningful contributions, it must be understood how this space is not confined to the shared physical or virtual space within the classroom. Inclusive knowledge sharing creates a space for identity expression, a space where one can be their true authentic self. In thinking about this space for knowledge creation and contribution, it is useful to consider the Japanese concept of *ba* (Nonaka & Konno, 1998). *Ba* can be described as the human's place for knowledge creation. This physical, virtual, or mental space "provides a platform for advancing individual and/or collective knowledge" with "the recognition of the self in all" (Nonaka & Konno, 1998, p. 40). This supports knowledge sharing as an inclusive process as the individual sense of self is of great importance in this space. This is not a fixed space of specific location and time. With the goal of transformative lifelong learning, learning goals should extend beyond the location and time constraints of traditional educational courses. Therefore, the learning space also extends beyond these constraints.

Contextualizing the Space

Knowledge sharing activities can elicit more tacit knowledge sharing and align with the connections of an inclusive learning environment when these activities have a shared problem or goal. Organizations often create teams to work on a shared problem or goal. This can be practiced in education where the facilitator creates groups and gives students a problem or goal to work on for inquiry or problem-based learning. However, knowledge sharing behaviors cannot be expected simply by creating groups and assigning problems. Knowledge sharing is known to be a voluntary behavior in which we would question what motivates one to exhibit knowledge sharing behaviors. The Theory of Planned Behavior (TPB) has frequently been used as a method of predicting knowledge sharing behaviors through an individual's attitude, social norms, and perceived behavioral control (Nguyen et al., 2019). "Perceived behavioral control refers to people's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 1991, p. 183). In a systematic review and meta-analysis, the establishment of social norms had less influence on the intention to share knowledge than attitude or perceived behavioral control (Nguyen et al., 2019). Therefore, creating groups and establishing group norms for sharing may not be an effective strategy on its own. "There should be a stronger focus on individual interest and resource facilitating conditions to encourage knowledge sharing rather than relying on social norms" (Nguyen et al., 2019, p. 89). The knowledge sharing activity should involve a problem or goal meaningful to the individual for intrinsic motivation. Even if the intention to share knowledge exists, this does not guarantee the knowledge sharing behavior will occur. Design of the inclusive knowledge sharing space should step away from strategies to force knowledge sharing behaviors

and focus on creating a space of support to connect learners based on their interests. Belonging is a motive for engagement (Strayhorn, 2019). A supportive space contextualized to the learner's goals and interests can motivate the learner to engage in knowledge sharing behaviors.

Knowledge Sharing Activities for Meaningful Contribution

Connections made with inclusive knowledge sharing can result in the empowerment to engage and contribute to this individualized learning space. Empowerment is a process "where people create or are given opportunities to control their own destiny and influence the decisions that affect their lives" (Zimmerman, 1995, p. 583). This empowerment is likely to increase the learner's perceived ability to contribute (i.e., perceived behavioral control) which would then influence decisions to act and contribute through knowledge sharing behaviors (Nguyen et al., 2019).

Knowledge sharing can be operationalized as collaborative work where contributions of knowledge are made, and new knowledge is created. Collaborative work has been acknowledged in the literature as a useful practice in the creation of inclusive learning environments (Cesar & Santos, 2006; Villa et al., 2005). In alignment with the transformative goals of knowledge sharing, any initiative to improve learning should consider the impact changes will have out in the world in both personal and performance contexts. The effects of collaborative work have been demonstrated to last beyond the time and space constraints of the collaborative work setting (Cesar & Santos, 2006). However, some collaborative activities lack real world consequence and are task focused without innovative or inclusive intentions. If knowledge is to be meaningful, it must "have a life out in the world" (Scardamalia & Bereiter, 2003, p.2). Moving beyond the practice of collaborative activity to an innovation focused knowledge sharing space can promote inclusivity through meaningful contributions.

Care and Support for Knowledge Sharing Activities

Knowledge has been identified as the key to success in terms of continuous improvement and innovation for organizations. This innovation is facilitated "mainly through knowledge sharing among workers" (Castaneda & Cuellar, 2020, p. 159). Myles Horton, an educator, and co-founder of the Highlander Folk School in 1932, realized the benefit of workers learning from each other for organizational advancement well before it was documented as knowledge sharing among workers in organizational research (Horton et al., 1990). When asked about the success of the Highlander Folk School, Horton attributed its success to the knowledge sharing among workers and students. Horton recognized the possibility in seeking knowledge from others, even if they were not considered an expert on the presented

problem (Horton et al., 1990). The inclusive knowledge sharing approach seeks out and values the contributions of all learners. Seeking knowledge from the learner, regardless of their novice or expert status, demonstrates respect toward the individual to let them know their input is valid and matters. Feeling respected is central to student sense of belonging (Vaccaro & Newman, 2016). Seeking knowledge from learners may influence their perceived behavioral control by letting them know they are capable of contributing something meaningful to their area of interest. Perceived behavioral control positively influences the intention to participate in knowledge sharing behaviors (Nguyen et al., 2019).

The classroom can be a space of uncertainty for learners. They may not feel welcomed by others. They may not feel they can be their true selves in this physical or virtual space. For the college student, a sense of belonging with the college may not translate into all situations, including classroom learning environments. Imagine how different a sense of belonging can be from one classroom to the next or from a campus activity where persons gather with shared interests to a classroom where a variety of interests and backgrounds exist. Whilst campus inclusivity efforts may prove beneficial for a campus sense of belonging, smaller scale events or situations in the classroom can have an impact on the student's overall sense of belonging (Hagerty et al., 2002). Each individual learning environment is equally important to the learner's overall satisfaction of their need to belong and matter. This demonstrates the importance of small-scale inclusivity efforts for the classroom in addition to campus wide efforts. The teacher plays a pivotal role in these efforts. A caring professor or mentor positively contributes to a sense of belonging (Freeman et al., 2007). Connecting with caring professors or mentors is a method of empowerment (Zimmerman, 1995).

The classroom is not always a welcoming space where people can be their authentic selves. This is the reality despite efforts to promote an inclusive, accepting, and welcoming culture within the college community. Some learners are likely to feel they do not belong with the group they are placed with. Mattering is a "quest for humanity" (Love, 2020). Mattering is being able to make connections and to feel empowered. Despite any feelings of discomfort with classmates, the learner can still make relevant contributions to others in relation to their personal interests and goals. The "others" I reference here are not always others in the classroom. It can be contributions between the facilitator and student, students from other classes, people from the local community or other communities of interest. It can be "others" in the general sense when learners create something contributing to the collective knowledge in an area of interest. This creation could benefit the profession as a whole and includes those in the profession and future members of the profession which the learner may or may not have direct contact with. It is this beneficial exchange of contributions where belonging and mattering are the result. Knowledge sharing promotes this exchange.

The Knowledge Sharing Process

Knowledge sharing is a process involving four stages of socialization, externalization, combination, and internalization (i.e., the SECI Model) (Nonaka & Konno, 1998). Knowledge sharing activities support these processes. Socialization is accomplished through joint activities. In the business domain, this involves direct interaction at the actual job site of interest. The externalization phase is supported through dialogue. Dialogue for knowledge sharing is "listening and contributing to the benefit of all participants" (Bohm, 1980, as cited in Nonaka & Konno, 1998, p. 44). In other words, contributing to the "others" in an area of interest. Combination is the process of combining and editing knowledge to make it more usable and internalization occurs when the newly created knowledge becomes tacit knowledge for the organization or community of interest (Nonaka & Konno, 1998).

Learning Design Considerations to Promote Knowledge Sharing Behaviors

The literature suggests "a stronger focus on individual interest and resource facilitating conditions to encourage knowledge sharing" (Nguyen et al., 2019, p. 89). Even if the intention to share knowledge exists, this does not guarantee knowledge sharing behavior will occur. The knowledge sharing activity should involve a problem or goal meaningful to the individual for intrinsic motivation. Activities with a shared problem or goal will promote more tacit knowledge sharing than activities without a shared problem or goal (Appel-Meulenbroek et al., 2018). Knowledge sharing activities require varying levels of social interdependence (Berends, 2005). While explicit knowledge sharing can be accomplished without this social interaction, tacit knowledge sharing only occurs through dialogue among learners, typically in an area of shared interest. Dialogue supports the externalization phase of the knowledge creation process (Nonaka & Konno, 1998). Based on the findings of this literature review, the following design considerations are recommended to promote knowledge sharing behaviors: (1) individual interest in the activity, (2) resource facilitating conditions, (3) a shared problem or goal meaningful to the individual (4) knowledge creation dialogue, and (5) support from a professor or mentor throughout the process.

Knowledge Sharing in the Educational Context

Knowledge sharing activities can be categorized as formal or informal (Turulja et al., 2021). Informal knowledge sharing can be accomplished by supporting dialogue in an area of shared interest (socialization and externalization). Conferences

or symposiums with mentorship are methods of formal knowledge sharing (Turulja et al., 2021). Knowledge sharing in education can be accomplished with student participation in research project collaborations, conferences, discussions, and publications (Asurakkody & Kim, 2020). This extends the knowledge sharing to others beyond the classroom and beyond the time constraints of the traditional course to promote transformative learning with innovative and inclusive intentions.

Future Research Needs

Inclusive learning is defined here as a space where the learner is making connections to find relevance for the self, feeling empowered to engage by receiving and making contributions to an area of interest, and feeling cared for and supported throughout the process. Although the concept of knowledge sharing has been primarily researched in the business domain, it can be applied to educational contexts with both innovative and inclusive intentions. With this foundation, further research can focus on the development of design principles for the creation of inclusive knowledge sharing spaces in education. In addition, the use of technology to facilitate resource sharing and supportive communications beyond the time and location constraints of the classroom should be considered. Future research on the complexity of creating a responsive knowledge sharing space for each learner is likely to benefit from design-based research (DBR). The DBR approach employs mixed methodologies, multiple iterations of design, and partnerships between designers and practitioners with the aim to produce design principles for a direct impact on practice (McKenney & Reeves, 2013).

Conclusion

This review sought to explore how knowledge sharing activities align with the three C's (i.e., Connection, Contribution, and Care) of inclusive learning. Current findings in the literature clearly connect the process of knowledge sharing to constructs of inclusive learning. Regardless of the activity type, the greatest amount of tacit knowledge sharing, and interdependent involvement occurred when connections were made through shared problems or goals. These shared problems or goals must be meaningful to the individual. Facilitating the recognition of self in learning spaces and defining spaces beyond time and location constraints, supports transformative lifelong learning efforts to tackle the demands of this diverse, knowledge-driven world.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Appel-Meulenbroek, R., Weggeman, M., & Torkkeli, M. (2018). Knowledge sharing behaviour within organizations: A diary-based study of unplanned meetings between researchers. *Knowledge Management Research & Practice, 16*(2), 267–279. https://doi.org/10.1080/14778238.2018.1459254

Asurakkody, T. A., & Kim, S. H. (2020). Effects of knowledge sharing behavior on innovative work behavior among nursing students: Mediating role of self-leadership. *International Journal of Africa Nursing Sciences, 12*, 100190. https://doi.org/10.1016/j.ijans.2020.100190

Berends, H. (2005). Exploring knowledge sharing: Moves, problem solving, and justification. *Knowledge Management Research & Practice, 3*(2), 97–105. https://doi.org/10.1057/palgrave.kmrp.8500056

Bohm, D. (1980). Wholeness and the Implicate Order. Routledge.

Castaneda, D. I., & Cuellar, S. (2020). Knowledge sharing and innovation: A systematic review. *Knowledge and Process Management, 27*(3), 159–173. https://doi.org/10.1002/kpm.1637

Cesar, M., & Santos, N. (2006). From exclusion to inclusion: Collaborative work contributions to more inclusive learning settings. *European Journal of Psychology of Education, 21*(3), 333–346.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions: Social and emotional learning. *Child Development, 82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Freeman, T. M., Anderman, L. H., & Jensen, J. M. (2007). Sense of belonging in college freshmen at the classroom and campus levels. *The Journal of Experimental Education, 75*(3), 203–220. https://doi.org/10.3200/JEXE.75.3.203-220

Freire, P., Macedo, D. P., & Shor, I. (2018). *Pedagogy of the oppressed* (M. B. Ramos, Trans.; 50th anniversary edition). Bloomsbury Academic.

Friedman, T. L. (2017). *Thank you for being late: An optimist's guide to thriving in the age of accelerations*. Picador.

Grobecker, P. A. (2016). A sense of belonging and perceived stress among baccalaureate nursing students in clinical placements. *Nurse Education Today, 36*, 178–183. https://doi.org/10.1016/j.nedt.2015.09.015

Gunawardena, C. N. (2020). Culturally inclusive online learning for capacity development projects in international contexts. *Journal of Learning for Development, 7*(1), 5–30.

Gunawardena, C. N., Frechette, C., & Layne, L. (2019). *Culturally inclusive instructional design: A framework and guide for building online wisdom communities*. Routledge, Taylor, & Francis Group..

Hagerty, B. M., Williams, R. A., & Oe, H. (2002). Childhood antecedents of adult sense of belonging. *Journal of Clinical Psychology, 58*(7), 793–801. https://doi.org/10.1002/jclp.2007

Heaster-Ekholm, K. L. (2020). Popular instructional design models: Their theoretical roots and cultural considerations. *International Journal of Education and Development using Information and Communication Technology, 16*(3), 50–65.

Horton, M., Freire, P., Bell, B., Gaventa, J., & Peters, J. M. (1990). *We make the road by walking: Conversations on education and social change*. Temple University Press.

Love, B. (2020). *We want to do more than survive: Abolitionist teaching and the pursuit of educational freedom*. Beacon.

Maslow, A. H. (1954). *Motivation and personality*. Harpers.

McKenney, S., & Reeves, T. C. (2013). Systematic review of design-based research progress: Is a little knowledge a dangerous thing? *Educational Researcher, 42*(2), 97–100. https://doi.org/10.3102/0013189X12463781

Metzger, M., & Taggart, J. (2020). A longitudinal mixed methods study describing 4th year baccalaureate nursing students' perceptions of inclusive pedagogical strategies. *Journal of Professional Nursing, 36*(4), 229–235. https://doi.org/10.1016/j.profnurs.2019.12.006

Nguyen, T. M., Nham, P. T., & Hoang, V. N. (2019). The theory of planned behavior and knowledge sharing: A systematic review and meta-analytic structural equation modelling. *VINE Journal of Information and Knowledge Management Systems, 49*(1), 76–94. https://doi.org/10.1108/VJIKMS-10-2018-0086

Nonaka, I., & Konno, N. (1998). Building a foundation for knowledge creation. *California Management Review, 40*(3), 40–54.

Osher, D., Kidron, Y., Brackett, M., Dymnicki, A., Jones, S., & Weissberg, R. P. (2016). Advancing the science and practice of social and emotional learning: Looking back and moving forward. *Review of Research in Education, 40*(1), 644–681. https://doi.org/10.3102/0091732X16673595

Scardamalia, M., & Bereiter, C. (2003). Knowledge building environments: Extending the limits of the possible in education and knowledge work. In A. DiStefano, K. E. Rudestam, & R. Silverman (Eds.), *Encyclopedia of distributed learning*. Sage Publications.

Strayhorn, T. L. (2019). *College students' sense of belonging: A key to educational success for all students* (2nd ed.). Routledge.

Thomas, L., & May, H. (2010). *Inclusive learning and teaching in higher education*. Higher Education Academy. https://www.lboro.ac.uk/media/wwwlboroacuk/external/content/services/cap/downloads/documents/HEA%20Report%20on%20inclusive%20teaching.pdf

Turulja, L., Cinjarevic, M., & Veselinovic, L. (2021). Information technology and knowledge sharing for better health care: An emerging economy context. *Journal of Knowledge Management, 25*(3), 559–572. https://doi.org/10.1108/JKM-09-2019-0514

Vaccaro, A., & Newman, B. M. (2016). Development of a sense of belonging for privileged and minoritized students: An emergent model. *Journal of College Student Development, 57*(8), 925–942. https://doi.org/10.1353/csd.2016.0091

van den Hooff, B., & de Ridder, J. A. (2004). Knowledge sharing in context: The influence of organizational commitment, communication climate, and CMC use on knowledge sharing. *Journal of Knowledge Management, 8*(6), 117–130. https://doi.org/10.1108/13673270410567675

Villa, R. A., Thousand, J. S., Nevin, A., & Liston, A. (2005). Successful inclusive practices in middle and secondary schools. *American Secondary Education, 33*(3), 33–50. https://www.jstor.org/stable/41064553

Zimmerman, M. A. (1995). Psychological empowerment: Issues and illustrations. *American Journal of Community Psychology, 23*(5), 581–599. https://doi.org/10.1007/BF02506983

Zumbrunn, S., McKim, C., Buhs, E., & Hawley, L. R. (2014). Support, belonging, motivation, and engagement in the college classroom: A mixed method study. *Instructional Science, 42*(5), 661–684. https://doi.org/10.1007/s11251-014-9310-0

Reimagining PBL to Develop Critical Thinking Skills for All Learners

Sharon Ndolo and Deborah Cockerham

As progress in technology supports an abundance of instantly available technology information, student skill needs are changing. No longer is the ability to recite all 50 state capitals a priority since students can determine the capital of any state—and many more capital and state details as well—with the touch of a finger. Rather than memorizing facts, today's students must learn to navigate overwhelming amounts of information. This multifaceted process, which requires analyzing, prioritizing, inferring, organizing, and synthesizing, is often described as *critical thinking* (Black, 2006).

Author's Note: Impetus of Study

The first author is an international student, born and raised in East Africa, Kenya. During her time in school, education was teacher-centered and challenging instructors' opinion was not well embraced. The educational style did not offer opportunities to be able to be more verbally active in the classroom. After migrating to the United States, there was a huge culture shock experience inside the classrooms that were student-centered. The instructors used a variety of teaching styles such as small group discussions. Some students participated more orally and were free to challenge the instructor's opinion. However, some students, including the author, still struggled with oral participation and did not know how to be more active in the classroom.

The co-author is a U.S. citizen who is self-diagnosed with mild auditory processing disorder. Born and raised in the US educational system, she lacked confidence to speak out in group settings throughout her growing up years due to her need for extra processing time. Because of this, she also preferred internalizing her thoughts rather than speaking out during group work activities.

This review of literature is conducted with an aim of creating an awareness of the diverse groups of students present in the classrooms who struggle with verbal participation during group work activities and advocate for instructors to design problem-based learning activities that allow for all student voices to be heard.

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Critical thinking is now promoted as an essential skill to be incorporated into all classrooms, causing educators to search for supportive resources and instructional designs that will strengthen these skills. To strengthen student engagement in the planning process, educators often turn to problem-based learning as an instructional design method that will support the development of critical thinking skills.

Project-Based Learning

A problem well stated is a problem half solved. –John Dewey, quoted in McKenney & Reeves (2012, p. 85).

The term "project-based learning" (PBL) refers to a social constructivist instructional design method that focuses on student learning and can support the development of critical thinking through challenging projects. Although individual interpretations of the concept may vary, researchers generally agree that PBL begins with a stimulating question or problem, is student-directed, requires critical thinking skills, and centers on real or realistic problems (Jones et al., 1997; Thomas et al., 1999, cited in Thomas, 2000).

In a review of PBL research, Thomas (2000) lists five criteria that differentiate PBL from similar models.

1. **Centrality**. The curriculum must center around the project; in effect, the project *is* the curriculum. Various disciplines are often integrated in PBL, and specific skills may need reinforcement to strengthen progress on the project. However, the project itself is the driver for the development of these skills.
2. **Driving question.** The questions should connect knowledge and skills with activities needed to solve the problem, which will increase student motivation to learn the basic concepts of underlying disciplines (Blumenfeld et al., 1991).
3. **Constructive investigations.** The problem must nudge students to strengthen skills, explore new areas, and deepen basic knowledge (Scardamalia & Bereiter, 1999). Student construction of knowledge is an element of PBL that distinguishes true PBL projects from community service projects such as cleaning a park or working in the soup kitchen.
4. **Autonomy.** Project outcomes should not be predictable since they are not teacher-directed. As students design the path and select activities for accomplishing their goals, they will develop unique solutions and pathways to these outcomes. In so doing, they will be fostering increased agency and independence in their own learning.
5. **Realism.** In real life, problems may be quite complex, and even the question may be unclear. They may involve multiple disciplines, require flexibility in roles, vary as the context changes, require collaboration, and/or result in products or other output. In like manner, PBL projects should focus on problems that provide students with opportunities to solve real-life or realistic scenarios.

The complexity of PBL makes it an advanced instructional method that requires a carefully designed learning environment, opportunities for collaboration, and well-prepared facilitators. Yet even when this approach is undertaken, educators frequently present students with well-conceived questions or problems that deny students the opportunity to interpret and construct problems (Svihla & Reeve, 2016).

The National Governors Association Center for Best Practices & Council of Chief State School Officers (2010, cited in Svihla & Reeve, 2016) has called for student involvement in *ill-structured* problem solving and question generation. The first step students must take in such a scenario is analysis and determination of the problem and its boundaries (McKenney & Reeves, 2012, p. 85). A true PBL approach should be grounded in real or realistic projects wherein students define not only the action plan, but also the question (Savery & Duffy, 1995). Although finding the time and flexibility for students to actually frame the problem is often a challenge in classroom application (Svihla & Reeve, 2016), allowing students to "own" the problem can strengthen student motivation and follow-through (Svihla & Reeve, 2016), build critical thinking skills, and better prepare students for the world of the future.

For the instructor, PBL implementation may require moving beyond his/her comfort zone. However, for the student, benefits from true PBL projects can far outweigh any concerns.

Problem Statement

In higher education institutions, problem-based learning activities often are based on verbal interactions (Flanagan & Addy, 2019). Instructors may center their pedagogies around speaking and listening, delivering course content through spoken lectures, and requiring student interactions in classroom discussions (Rosheim, 2018; Medaille & Usinger, 2019). However, the diverse needs of students during discussions are not well considered (Flanagan & Addy, 2019). In addition, recent research (Ndolo, 2021) suggests that student agency is a key factor in the development of critical thinking skills.

Students' Preference for PBL Activities

Despite the benefits of PBL, the learning design may not be effective unless it considers how discussions that involve diverse students may affect group performance (Walker, 2007). Group discussions may require students to respond quickly, with minimal time for processing thoughts. The pressure to suddenly converse about new topics may not be optimum for some students (Emirza & Sahril, 2021).

An overemphasis on the use of PBL without considering the diversity of students is not recommended because not all students are motivated to work in groups (Offir

et al., 2007). For example, introverted students may prefer to reflect on concepts taught during class rather than to participate in group work activities and may not be comfortable with social stimulation (Emirza & Sahril, 2021; Flanagan & Addy, 2019; Paradilla et al., 2021).

The preference for individual work other than group work learning activities such as PBL might be due to previous learning experiences (Walker, 2007). Students who have had difficulties during previous group work activities may be hesitant about participation in additional group tasks (Forrest & Miller, 2003), or lack of confidence with personal speaking skills may make students cautious about voicing their opinions or challenging another person's thoughts (Paradilla et al., 2021; Spark et al., 2018). Language barriers based on either cultural diversity or learning differences may also limit students' comfort with verbal participation. Such students may be concerned about their pronunciation, their vocabulary, understanding the speaker's message, or providing a quality answer. This could lead to increased anxiety levels and decreased self-confidence in the ability to speak up during discussions (Emirza & Sahril, 2021). **S**ome foreign students who are required to express themselves in English during group discussions may not be fluent enough to communicate clearly, since speaking skills are an important factor in verbal exchange of information (Emirza & Sahril, 2021).

On the other hand, higher education classrooms may be comprised of students who enjoy PBL learning activities, retrieve information quickly, and communicate with confidence (McClulloch, 2020). Unfortunately, these students' love for group discussions can make them unwittingly dominate group discussions, leaving some of their peers silent as they utilize more time in thinking and reflecting before they speak up during discussions (Emirza & Sahril, 2021; Flanagan & Addy, 2019; Nussbaum, 2002; Offir et al., 2007). The time spent in thinking (*delayed time factor*) before responding during group discussions results in a delayed response, potentially leading to class discussions that are dominated by a few talkative students (Hsu & Huang, 2017; McClulloch, 2020).

PBL Design Considerations for Inclusive Learning

To ensure an inclusive learning environment during problem-based learning activities, researchers emphasize the importance of establishing classroom norms/group norms before engaging in group work activities (Monahan, 2013). This is because problem-based group work activities are more likely to be successful when students know what is expected of them. Establishing group norms helps the students build relationships with one another (Gillies, 2003). Blatchford et al. (2003) concurs, emphasizing the importance of giving groups the opportunity to build trust, sensitivity, and respect for each other, and to resolve conflicts through repeated opportunities to work together.

High anxiety levels experienced by students who dislike group work activities can be reduced by allocating some time for "breathing space," which allows

students to be able to think about their ideas, use advance organizers to write down their ideologies before participating verbally (Offir et al., 2007). The time allocated for thinking is referred to as the "reflective pause," which is beneficial for all students in the classrooms as it gives them time to reflect on their answers instead of providing quick verbal responses (McClulloch, 2020). Jeff Bezos, founder and former CEO of Amazon, used this technique in collaborative meetings at Amazon, which began with silence as group members read a memo and were asked to write what they wanted to say before speaking (Gino, 2015).

In addition to the reflective pause offered to students, instructors could utilize the "think-pair and share" methodology instead of "pair- think and share" approach (McClulloch, 2020). In this approach, instructors assign tasks to students before the class session, allowing time for students to first process their thoughts and then share them with one partner before participating in group activities. The strategy is also supported by the flipped classroom approach, in which students view a presentation of content before coming to class and then are guided to apply the concepts during class time (Sun & Wu, 2016). A quasi-experimental research study on the effectiveness of teaching using Open Courseware in flipped classroom and distance learning found that learner-learner interactions and instructor-learner interactions were increased in flipped classrooms (Sun & Wu, 2016).

Further, faculty can assign roles for each student in the group. This can be facilitated by breaking down group tasks into subcomponents, and then assigning each task to a student (Walker, 2007). Tasks might include a Facilitator, who leads the group; a Recorder, who takes notes on the group's ideas and progress; a Summarizer (or Listener), who restates the group's ideas and progress; and a Presenter, who shares the completed project with other members of the class. Other students could take notes, keep track of talking time, or perform another project-specific task so that each group member has a specific role (Emirza & Sahril, 2021; Monahan, 2013). Though smaller classrooms are often associated with quality interactions and ease in grouping students during project-based group activities, large classes may enrich interactions due to higher levels of social presence and several discussion topics of interest (Kim, 2013). Thus, educators should strategically group students in a way that allows for more interactions regardless of the class size.

Finally, although PBL advocates for students to take active roles in their own learning, instructor active presence is needed in facilitating, guiding, monitoring, and intervening in discussion when needed (Donham et al., 2011). To ensure full class participation, instructors can ask questions that probe accuracy, relevance, and depth of information and encourage students to consider new or overlooked issues. For example, instructors can design intervals of class discussions where they join each group while students work on their ill-structured problem (Donham et al., 2011). Nagel and Kotze (2010) recommend using the Community of Inquiry framework (CoI) which measures the quality of teaching by ensuring there is social presence, teaching presence, and cognitive presence for successful learning.

Conclusion

Previous research advocates for the diverse needs of the learners to be met instead of a one-size-fits-all group work activities (Offir et al., 2007). Through increased awareness of the diversity of students in the classroom, instructors can design and implement learning activities that are effective for developing critical thinking skills (Chowdhury, 2006). Meanwhile, students can continue embracing the changing learning environment as instructors work to ensure equal participation for all students. Taking the time to encourage students to share their experiences during problem-based learning activities can improve group learning activities.

Findings from the review of literature can support instructors, instructional designers, and introverted students or international students who come from cultural backgrounds that did not promote student-centered learning activities. Findings can also increase instructor and instructional designers' awareness as they plan and prepare for group work activities that encourage development of critical thinking skills for all students.

The dislike of group work activities among some students ignites the need for more research on contributing factors such as student personalities that keep students silent during discussions. An understanding of such factors could provide a more robust understanding of student perspectives helping instructors and instructional designers to develop inclusive group work activities. Moreover, future scholars should explore the perspectives of international student experiences with group work activities in American classrooms, as students are the best source of information about how to improve and structure group work activities (Cockerham et al., 2021). Lastly, future scholars should investigate the effectiveness of group norms used to ensure equal participation in the classrooms.

References

Black, B. (2006). *Cambridge assessment*. Retrieved February 17, 2017, from http://www.cambridgeassessment.org.uk/Images/109971-critical-thinking-factsheet-1.pdf

Blatchford, P., Kutnick, P., Baines, E., & Galton, M. (2003). Toward a social pedagogy of classroom group work. *International Journal of Educational Research, 39*(1–2), 153–172. https://doi.org/10.1016/S0883-0355(03)00078-8

Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist, 26*(3–4), 369–398.

Chowdhury, M. (2006). Student's personalities and academic performance: A five factor model perspective. *College Quarterly, 9*(3) http://collegequarterly.ca/2006-vol09-num03-summer/chowdhury.html

Cockerham, D., Lin, L., Ndolo, S., & Shwatz, M. (2021). Voices of the students: Adolescent well=being and social interactions during the emergent shift to online learning environments. *Education and Information Technology, 26*, 7523–7541. https://doi.org/10.1007/s10639-021-10601-4

Donham, A., Richard, S., & Bernhardt, A. (2011). Problem-based learning. *New Directions for Teaching and Learning, 128*, 21–29.

Forrest, K. D., & Miller, R. L. (2003). Not another group project: Why good teachers should care about bad group experiences. *Teaching of Psychology, 30*(3), 244–246

Flanagan, K. M., & Addy, H. (2019). *Introverts are not disadvantaged in group-based active learning classrooms*.

Emirza, F., & Sahril, M. (2021). An investigation of English-speaking skills performance of introvert students in speaking class. *English Journal, 15*(1), 10–17.

Gillies, R. (2003). Structuring cooperative group work in classrooms. *International Journal of Educational Research, 39*, 35–49.

Gino, F. (2015). Managing people; Introverts, extroverts, and the complexities of team dynamics *Harvard Business Review.* Retrieved from: https://hbr.org/2015/03/introverts-extroverts-and-the-complexities-of-team-dynamics

Hsu, C. F., & Huang, I. T. (2017). Are international students quiet in class? The influence of teacher confirmation on classroom apprehension and willingness to talk in class. *Journal of International Students, 7*(1), 38–52.

Jones, B. F., Rasmussen, C. M., & Moffitt, M. C. (1997). *Real-life problem solving: A collaborative approach to interdisciplinary learning*. American Psychological Association.

Kim, J. (2013). Influence of group size on student's participation in online discussion forums. *Computers and Education, 62*, 123–129. Retrieved from: http://www.elsevier.com/locate/compedu

McClulloch, H. (2020). Embracing introverts in the classrooms: A guide to helping students and teachers survive and excel. *MindBrainEd Journal, 2*, 46–68.

McKenney, S., & Reeves, T. C. (2012). *Conducting educational design research*. Routledge.

Medaille, A., & Usinger, J. (2019). Engaging quiet students in the college classroom. *College Teaching, 67*(2), 130–137. https://doi.org/10.1080/87567555.2019.1579701

Monahan, N. (2013). *Keeping introverts in mind in your active learning classroom*.

Nagel, L., & Kotze, T. (2010). Supersizing e-learning: What a CoI survey reveals about teaching presence in a large online class. *Internet and Higher Education, 13*, 45–51. https://doi.org/10.1016/j.iheduc.2009.12.001

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common core standards for mathematics*. Authors.

Ndolo, S. (2021). Effective feedback strategies that promote critical thinking skills in online learning environments: An online assessment learning perspective. In Y. Wen et al. (Eds.), *Expanding global horizons through technology enhanced language learning* (Lecture notes in educational technology). Springer. https://doi.org/10.1007/978-981-15-7579-2_10

Offir, B., Bezalel, R., & Barth, I. (2007). Introverts, Extroverts, and Achievement in a Distance Learning Environment. *American Journal of Distance Education, 21*(1), 3–19. https://doi.org/10.1080/08923640701298613

Paradilla, N., Dj, M. Z., & Hasanah, U. (2021). The students' extrovert and introvert personality toward speaking performance. *International Journal of Research on English Teaching and Applied Linguistics, 1*(1), Article 1. https://doi.org/10.30863/ijretal.v1i1.1197

Rosheim, C. K. (2018). *A cautionary tale about using the word shy: An action research study of how three quiet learners demonstrated participation beyond speech*. https://libproxy.library.unt.edu:2147/10.1002/jaal.729

Savery, J. R., & Duffy, T. M. (1995). Problem based learning: An instructional model and its constructivist framework. *Educational Technology, 35*(5), 31–38.

Scardamalia, M., & Bereiter, C. (1999). Schools as knowledge-building organizations. In D. Keating & C. Hertzman (Eds.), *Today's children, tomorrow's society: The developmental Health and Wealth of Nations* (pp. 274–289). Guilford.

Spark, A., Stansmore, T., & O'Connor, P. (2018). The failure of introverts to emerge as leaders: The role of forecasted affect. *Personality and Individual Differences, 121*, 84–88. https://doi.org/10.1016/j.paid.2017.09.026

Sun, J., & Wu, Y.-T. (2016). Analysis of learning achievement and teacher -student interactions in flipped and conventional classrooms. *The International Review of Research in Open and Distance Learning, 17*(1), 79–99. Retrieved From: https://files.eric.ed.gov/fulltext/EJ1090880.pdf

Svihla, V., & Reeve, R. (2016). Facilitating problem framing in project-based learning. *Interdisciplinary Journal of Problem-Based Learning, 10*(2), 19–36.

Thomas, J. W. (2000). *A review of research on project-based learning*. The Autodesk Foundation.

Thomas, J. W., Mergendoller, J. R., & Michaelson, A. (1999). Project based learning for middle school teachers. *Middle School Journal, 36*(2), 28–31.

Walker, A. (2007). *Group work in higher education: Are introverted students disadvantaged?, 6*(1), 20–25. Sheffield Hallam University. https://doi.org/10.2304/plat.2007.6.1.20

Using Technology to Foster Inclusion and Diversity in Higher Education: A Case study of Geospatial Tools in Engineering Education

Shivani Ramoutar, Jennifer Richardson, Bheshem Ramlal, and Jason Tambie

The effects of exploring diversity in the classroom present a broad range of educational outcomes, ranging from active thinking, intellectual engagement, and motivation to appreciating multiple perspectives, citizenship engagement, and racial and cultural understanding (Gurin et al., 2002). In the higher education setting, young adults are presented with the opportunity for intellectual experimentation and identity development through critical reflection, discussion, and perspectives from multiple peers of diverse backgrounds (Gurin et al., 2002). Within the fields of Science, Technology, Engineering and Math (STEM), inclusion and diversity are especially important since gender stereotypes and roles often determine the division of labor and access to opportunities (Strayhorn, 2012). Additionally, researchers advocate for diversity in the engineering profession, and suggest the future of the field depends on creativity that emerges from diverse life experiences (Capretz & Ahmed, 2010; Wulf, 2001).

Within the classroom, instructional design plays a key role by facilitating diversity through techniques such as student-centered learning and personas, which facilitate a human-centered focus (Pulsinelli & Roubie, 2001). Instructional designers can also be deliberate about incorporating diverse experiences, perspectives, and preferences through culturally inclusive instructional design and wisdom communities (Frechette et al., 2014; Gunawardena et al., 2018; Gunawardena et al., 2006). Researchers recommend that pedagogy should focus on behavioral norms and multicultural backgrounds in culturally diverse contexts (Wlodkowski & Ginsberg, 1995) since efforts to improve cultural policy and culturally relevant pedagogy and

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curricula have a positive effect on motivation and academic success of minority ethnic groups in education (Strayhorn, 2021; Kumar et al., 2018; Tate, 1997). As such, the conceptualizations and beliefs of diversity in the educational context are critical issues; technology and its affordances are one way in which educators and researchers can connect students to each other and give voice by showcasing personal narratives in the classroom.

Storytelling technology assists students in developing a positive attitude toward the learning process by promoting active involvement and creativity while gaining the opportunity to tell unique stories in a meaningful and creative way (Hamilton & Weiss, 2005; Wang & Zhan, 2010). Combining this with geospatial-specific pedagogy provides the additional benefit of catering to multidisciplinary learning contexts while facilitating the acquisition of learner skills such as critical thinking, problem solving, and creativity as it pertains to location and setting (Brown et al., 2018; Liu & Zhu, 2008). The selected technology in this study is "StoryMaps," which is an online storytelling platform developed by the Environmental Systems Research Institute (ESRI). It is used by organizations and educational institutions to create personal and authoritative narratives by using a combination of text, data, media, maps, and spatial data (Kerski, 2020; Marta & Osso, 2015). Instructors view "StoryMaps" as a user-friendly tool for promoting learner interactivity and for sharing multimedia and presentation content authored by students which can be published online immediately and made accessible across multiple institutions via the Internet (Cope et al., 2018; Strachan & Mitchell, 2014).

Instructional design often considers multiple social and cultural perspectives when approaching learning as a social activity, and the context and affordances of multimedia and interactive environments (Bandura, 2002; Henderson, 1996; Lowyck, 2014; Moore & Anderson, 2003). Research and principles highlight the importance of teaching with diversity, involving all minds at work, and acknowledging differences based on learning and theoretical approaches, society, and culture (Anderson & Adams, 1992; Jung & Gunawardena, 2015). Creating culturally inclusive design necessitates an examination of both learner and instructor cultural values (Gunawardena et al., 2018) and calls for reflective practice and understanding the cultural contexts of instruction (Mishna & Bogo, 2007; Heaster-Ekholm, 2020). However, this is usually challenging since instructional designers and educators may not be aware of cultural variables and realities, or may find it challenging to adapt instruction to these nuances, which in turn impacts achievement of learning goals and competencies (Rogers et al., 2007). Oftentimes, culture is addressed in a retroactive manner after instruction is completed (Heaster-Ekholm, 2020) and there is a lack of tools, knowledge, and guidelines to include culture and diversity in context in the classroom (Heaster-Ekholm, 2020; Young, 2008).

In this study, critical issues of gender and diversity in the field are conceptualized and narrated by student perspectives in a multicultural educational context. Their initial beliefs and ideas are presented using descriptive statistics and qualitative analysis. This chapter also explores the instructional design and pedagogical approaches from the instructor's point of view in creating culturally responsive teaching practices which are analyzed and presented thematically. In addition, since

Geomatics Engineering is a highly technical field which produces unique spatial outputs, we offer the perspective of a Subject Matter Expert (SME) who has conceptualized student focus group opinions on the university as an inclusive space using open geospatial analysis and tools.

The following research questions are explored:

- How do graduate students and instructors conceptualize diversity in an interdisciplinary STEM course?
- What are the key issues of student interest as it pertains to diversity in the engineering profession?
- How do students and SMEs represent these key issues via narratives and geospatial tools?

It is our hope that by integrating student voice, instructor decisions, SME perspectives, and their narratives, we can offer key takeaways, best practices, and future directions for instructional designers, students, and educators in STEM education.

Description of Course and Learning Context

Within the field of engineering, interdisciplinary subjects that examine the intersection of technology with social issues provide a key opportunity for examining the potential to improve diversity and inclusion in the learning environment. We investigated one such graduate-level course, which explores issues such as gender, ethics, and diversity in the technical field of geomatics engineering at a regional university in the Caribbean

The course approach highlights the importance of including underrepresented groups through investigating local community input, mapping local knowledge, and giving grassroots populations voice and stakeholder status in decision-making processes using techniques such as Public Participatory GIS (PPGIS). The course was introduced in 2008/2009 as a core course in the MSc. Geoinformatics program. The typical class size is around 10–20 graduate students who are professionally employed in business and government sectors, or within the university as instructors and researchers. Specific student professions include geographers, IT specialists, geomatics engineers, valuation surveyors, geologists, environmental and resources managers, civil engineers, and other associated professionals. The program has students of diverse ethnic and cultural backgrounds and traditionally has more female than male students, especially in the last five years. The students are from the Caribbean region, including Trinidad and Tobago, Jamaica, St. Kitts and Nevis, Barbados, Grenada, St. Vincent and the Grenadines, and Guyana. A smaller number of students are from the USA, Germany, the Pacific Islands, and Canada.

Research Design

This study used a mixed-methods approach and was undertaken in three phases using a pre-survey, a focus group, and in-depth interviews (Fig. 1). This approach was taken to obtain an appreciation of inclusion and diversity in the context of an interdisciplinary engineering course for graduate students, as previous researchers have recommended (Crowe et al., 2011). At the start of the study, a pre-survey was administered via Qualtrics to collect demographic and background information ($n = 8$). The questionnaire rated participants' general beliefs on diversity and inclusion in higher education, and their responses to specific diversity and community experiences within the course (collaboration, representation, multicultural understanding and representation, and their use and experience of technology as it facilitates diversity). The specific potential for GIS as it relates to using technology to share, create, and highlight diverse experiences was measured by student ratings.

The focus group took place via Zoom conference call and was attended by four students, and the instructor as part of their weekly class session. Data from the focus group was transcribed and relevant themes were derived from student discussion to highlight their narratives on diversity and inclusion and how they would potentially use their geospatial background to highlight these issues. We used a typological approach to derive themes from the student discussion (Hatch, 2002), such as using geospatial tools to highlight issues of crime and violence, unemployment, gender diversity, and safety of women in STEM. Out of the participants, only one student gave permission to share the final map products. As such, an additional step was taken by conducting two further in-depth interviews with that student to design,

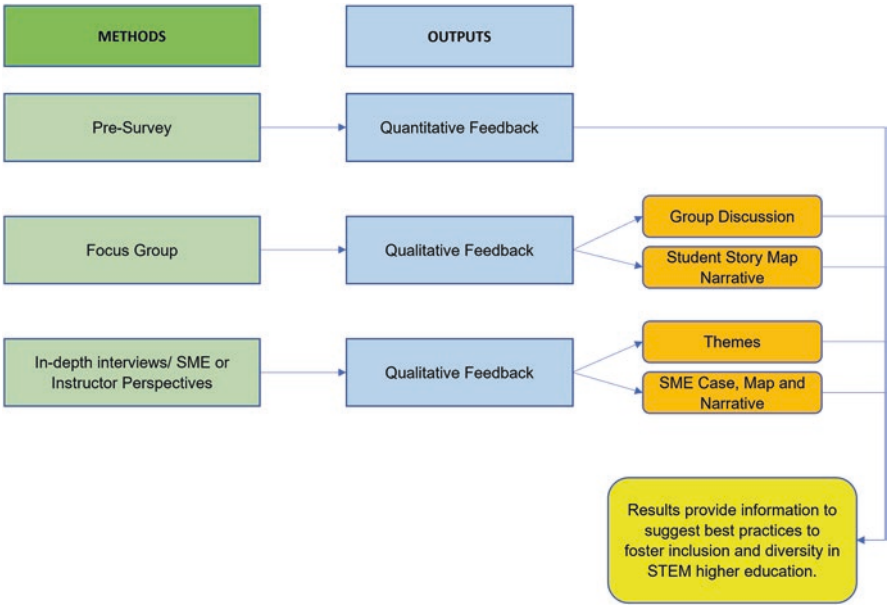

Fig. 1 Research design

create, and refine individual geospatial content for her narrative as a young woman in STEM. The SME worked with the research team to conceptualize his findings on the student discussions, using his background knowledge on geospatial tools to represent the student feelings of inclusion, and belonging within the university environment. Finally, the instructor's perspectives were derived from a 2.5 hour Zoom conference. This interview was recorded, transcribed, and analyzed using an interpretive approach (Hatch, 2002), and will be presented thematically.

The results of our analysis will be presented as answers to the three research questions, after which we will discuss all findings generally and recommend instructor best practices as they emerge from the study.

Findings on RQ 1: How Do Graduate Students and Instructors Conceptualize Diversity in an Interdisciplinary STEM Course?

Demographic data collected on the course participants and their beliefs reveal an equal number of male (n = 4) and female participants (n = 4) who strongly agree (80%) or agree (20%) that the higher education classroom should meet the needs of diverse populations while incorporating learning about diverse groups and cultures. Half believe that instruction should be more inclusive of their own culture and 17% of participants highlighted that at present, they were unable to learn about the culture of their peers or recall multicultural examples. These responses highlight the opportunities present in their current learning environment, and the exploratory questions highlight their perspectives while learning about others. All respondents agree that geospatial tools allow sharing of relatable educational content; geospatial tools can be used to showcase diverse cultures and identity in the classroom.

The potential of GIS (Fig. 2) poses ambiguity for the participants at the pre-survey stage. Here, they acknowledge that GIS can be used for providing

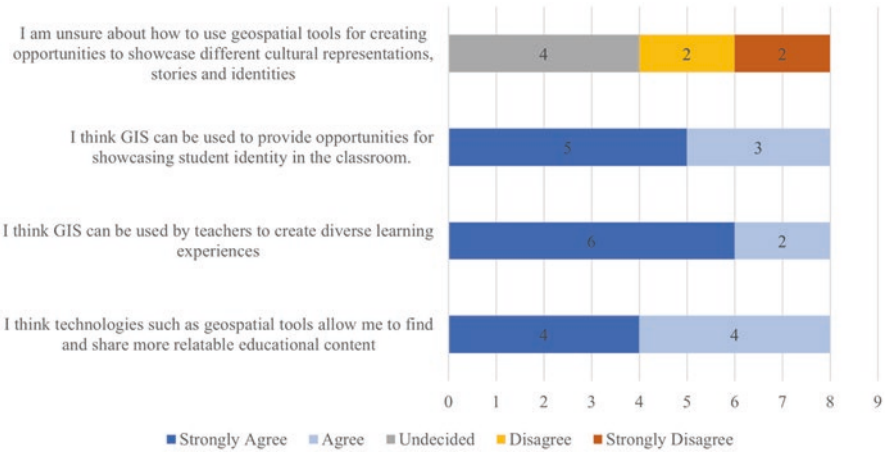

Fig. 2 Student perceptions on potential for GIS

opportunities for showcasing student identity (62.5%) and that it has potential for creating diverse learning experiences (75%). However, they are more uncertain when their own agency is questioned, with 50% being undecided on their use of geospatial tools for creating opportunities to showcase different cultural representations, stories, and identities.

Conceptualizing Diversity: Student Perspectives

In the focus group, students conceptualized diversity by several definitions, worked examples, and generated thoughts. A typological analysis reveals that diversity includes "uniqueness," "culture," "inclusion," "class composition," and "acceptance." Students also conceptualized their geographic culture as synonymous with diversity, as many nationalities and cultures are present in the Caribbean landscape and diversity is an innate part of their identities. More specific phrases include "equality between genders and races" and "multiple cultures." Specific examples as transcribed are explored below, when students were asked to articulate their definitions of diversity:

> ***Student 1:***
> Mixture of people of different races, different genders, different cultures all in one room, you know, being peaceful without fighting, you know, that kind of thing compared to different places, that's not really possible in different places around the world.
> ***Student 2:***
> I am not too sure. I think it depends on the context. But generally, I think diversity means the inclusion or acceptance regardless of race, ethnicity, gender, or religion. I think it may also touch on the subject of equal opportunity for all.
> ***Student 3:***
> I did my BSc in Geoinformatics. I believe, well, this is from my personal experience that we had a diverse class…there were people from all over the Caribbean.

Within the classroom, students also mentioned that informal encounters were important to their understanding of diversity in providing experiences for learning different professional standards and learning about different cultures. They valued these experiences, as they fostered knowledge and community.

> ***Example 1***
> We had three foreigners, one from Guyana, one from Saint Lucia, and one from Barbados. True, from a simple geomatics perspective, we wasn't *[sic]* able to learn much about Barbados surveying, and then we learn in Barbados they don't use a solar. [student speaks about best practices and professional standards differing by islands]
> ***Example 2***
> Like we used to stay back and study in the department I didn't learn as much [about diversity] in class than what I did just old talking with everyone. Maybe that should have been included in the classroom itself.

The instructor conceptualized diversity as nuanced, compounded by inequitable access to resources and opportunities as it pertains to "culture," "equity," and "inclusion in education." An excerpt is taken from his interview:

> Diversity is not only on ethnicity, it's not only on cultures, but it is on opportunities or lack of opportunity created by these circumstances…in each particular context and not just in

different countries but in different homes…in a digital divide the lack of access to certain kinds of tools and technologies because of income levels and because of the size of families and several other things…if you think in terms of what the extent to which people would benefit or not benefit from education as a result of the particular divide…diversity it could be much more nuanced as a consequence of other factors, other variables. So, while the focus will be on thinking in terms of gender thinking in terms of ethnicity, we also have to even think about age because different ages of people and different income levels and background in terms of economic factors in terms of income levels in terms of other things because the way that you are educated, the confidence you have, the exposure you have is completely different and that kind of diverse foundation makes it very difficult for some of our people to be incorporated effectively in education.

Findings: RQ2: What Are the Key Issues of Student Interest as It Pertains to Diversity in the Engineering Profession?

The focus group session highlighted four main areas of student interest (Table 1), as they discussed their own perception of important issues in the field and plan how they would use their geospatial knowledge to draw attention to these issues. These

Table 1 Focus group selection of topics – examples

Issue highlighted	Student description	Location	Instructor notes	Narrative
Safety of Women in STEM	*"There have been many cases where women feel threatened in the workplace. Particularly, women in the field of STEM are often undermined [in] their ability to perform certain tasks since it is a male dominated field. This may affect the amount of women choosing careers in this field."*	Trinidad	Student chooses two images on location; one is an infographic with male / female experiences of discrimination, workplace success and sexual harassment. Statistics of gender distribution in industry.	*"Advocating for the safety and respect of women in the field of STEM. Women are often undermined of their abilities to perform certain tasks in some circumstances. In some cases, women may feel intimidated and often threatened which can affect the amount of women choosing a field in STEM. GIS can be a platform for women to feel safe and report these instances in their workplace so something can be done about these cases."*

(continued)

Table 1 (continued)

Issue highlighted	Student description	Location	Instructor notes	Narrative
Gender Diversity in STEM	*"Classroom Gender diversity in the Geomatics discipline Visually represent difference in gender"*	Caribbean islands that offer a Geomatics degree program or related study area	Student chooses to highlight diversity by selecting an image of students of different races, attending college.	*"From my background in my BSc Geomatics most of my classes were culturally diverse with persons from different Caribbean islands such as Barbados and St Lucia. Although this was [the] case there it was mostly dominated by males. I would like to see the inclusion encouragement for more females in the classroom and discussions."*
Unemployment	*Highlight: Rate of Unemployment over the last 15 years.*	India, Trinidad, Malaysia	The student illustrates this narrative by using maps of Trinidad and India (choropleth density, socioeconomic data)	*"I think that unemployment is one particular social issue that needs more attention. Maps can be created which will geospatially highlight the unemployment in a particular study area. If this is done over the years, we will be able to highlight the trends and conduct research on the issue."*
Crime and Violence	*Domestic violence and sexual assaults and kidnappings.*	Trinidad and Tobago	One example I can think of was the use of an ArcGIS Dashboards app, by the public to monitor workforce diversity metrics. I also remember the same ArcGIS Dashboards app created to be used by the public on mobile devices, to explore patterns in the race/ethnicity of the police and subjects in use of force incidents.	*I have never considered this before, but given the issues faced in my country, I thought about the application of GIS to help women in terms of domestic violence and the horrendous crimes of sexual assaults and kidnappings.*

include safety of women in STEM, gender diversity, unemployment, and crime and violence. Key narratives of the case are also summarized within the table, as many students expressed that they have never been asked outright how their own expertise could be used to draw attention to issues of diversity, equity, inclusion, and justice (DEIJ). As such, the session provided a first draft on these conceptualizations, which are presented in table format, and the final output within the "StoryMaps" platform will be explored in the next section.

Findings: RQ3: How Do Students and SMEs Represent These Key Issues Via Narratives and Geospatial Tools?

Student "StoryMap"

In this study, we were able to obtain permission from only one student to showcase her StoryMap in our results. To keep her identity anonymous, we have decided to host the StoryMap content using the account of the lead author. The map can be accessed at: https://storymaps.arcgis.com/stories/1e9be3f9f93c4a07b1851cdbda3f9c0a

The student topic was gender diversity as it pertains to the job market, which is a topic she began exploring in the focus group and later developed within the "StoryMap." She begins by providing a general spatial overview of economic activity as it relates to spatial land cover within the island of Trinidad. Statistics from the Central Statistical Office (CSO) of Trinidad and Tobago were then used to generate graphs and explain the gender differences that exist in the space, with more females than males facing the issue of unemployment. She chose to highlight personal encounters and led the narrative into gender roles and stereotypes in her field. During the process of sourcing data, she remarked that it was difficult for her to source authoritative data and author her own content to illustrate her story using proprietary GIS software.

SME Perspective

The SME analyzed the student conversations and created the following map as an example of how geospatial tools can be used to visualize spaces of inclusion within the context of the university. Data was derived from student input and discussion during the Zoom interviews, and includes spaces of creative expression, recreation, relaxation, and socialization. These spaces are found in the built environment of the university. In this way, diversity and inclusion is more than conceptualization, practice, and pedagogy; it is part and parcel of the space that students exist and coexist within and can be used by students as a way of knowledge and accessing the spaces, or by the university administration for identifying gaps of resources, access, and inclusion within the space (Fig. 3).

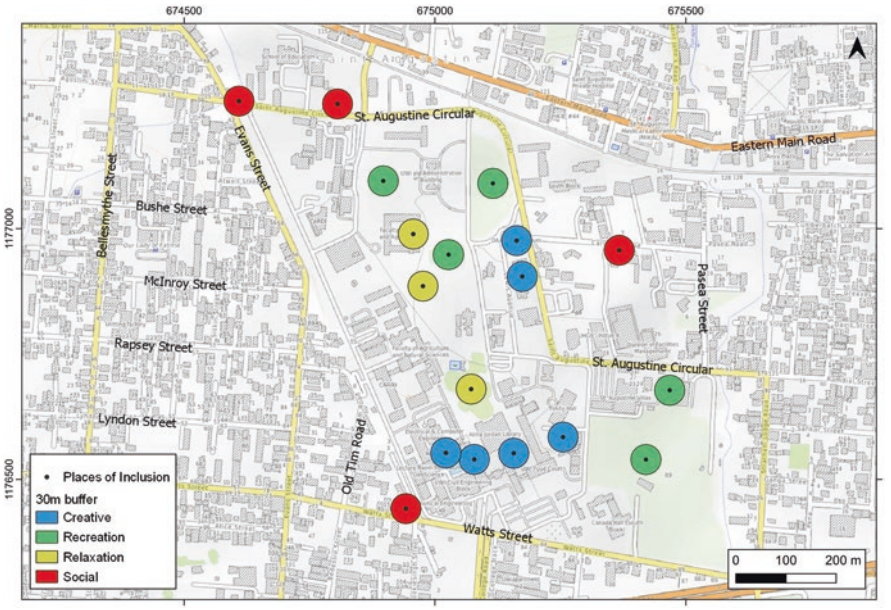

Fig. 3 Map of the University showing inclusive spaces

Discussion

Learner Needs

Our findings suggest that while students do recognize the importance of diversity, equity, inclusion, and justice, there are several needs that must be met in order to empower them with the tools, capabilities, and knowledge to solve, conceptualize, and communicate issues of importance in DEIJ. Our findings suggest that having multiple voices and community within learning is essential; students cherish informal and "laid back" experiences with their peers and their instructor and even derive essential information on work, life, and best practices in the profession during these interactions. These findings can be guided with promotion of affective exchanges among communities (Gunawardena et al., 2006) and support the concept that informal interactional diversity is positively linked to structural diversity (Pike & Kuh, 2006); in other words, valuable exchanges of information occur in settings where students of diverse backgrounds are present (positive diversity interactions are promoted). As such, like other researchers, we continue to advocate for inclusion of multiple perspectives and voices within the classroom. In addition, students should be empowered with both access to data and resources to help illustrate the narratives they are passionate about. Their voices are captured best when given the opportunity to contribute, reflect, and create within their communities. Within highly technical fields like geomatics engineering, more inclusive practices like using open-source

data and software are beneficial to students as the main impediment to student creativity stems from lack of data to support their ideas and narratives. Open GIS fosters curiosity and crowd-driven opportunities that promote education-focused visions (Sui, 2014).

Instructor Best Practices

The instructor makes the following recommendations for designing inclusive instruction in engineering classrooms. These are presented from his personal reflections as an experienced practitioner within the study context. Many of these practices have found success with improving DEIJ experiences in the classroom. Specific recommendations for the STEM field are presented in the list:

1. Differentiated Instruction: Drawing from the diversity of life experiences and using them to inform instruction to target unique needs is important in STEM education.
2. Adjusting to language, background, and culture within the classroom and being deliberate in exchanges with students.
3. Correcting "fears" and "barriers" in previous instruction to create a safe space in the classroom.
4. Awareness of multiple professional requirements (this is dependent on the student's geographic origin and occupation) – instructors should make use of examples and incorporate these in the classroom.
5. Target instruction to suit context: The instructor advises to be aware of the content that is taught and discuss the applicability to a student's future.
6. Instructor attitude of open and continuous learning. The importance of being a reflective practitioner is essential to creating diverse and inclusive experiences.
7. Recognition of a student's unique identity and allowing the student's voice to be present.
8. Recognizing the limitations of technology's design to accommodate diversity and inclusion, and supplement this with good instruction (it is not enough to learn a particular skill and to be versed in a technology; context and adjustment is important).

Using Geospatial Tools and Spatial Data for Highlighting Diversity in the Landscape

Spatial data is important in representing and symbolizing spaces of meaning as they pertain to diversity and inclusion. According to the Commission for Architecture and the Built Environment (CABE, 2008), the quality of people's lives is influenced by the quality of spaces and buildings that they interact with. The design and

location, as well as the management and use of places affect the benefits people derive from the places and the sense of belonging that they feel (CABE, 2008). Inclusive and diverse spaces can have various uses and facilitate several types of activities. For example, in a university setting there are spaces which students use for creative expression, relaxation, recreation, and social activities. Mulrooney and Kelly (2020) investigated students' perceptions of a university campus and found major themes surrounding *belonging*, whereby the physical space can affect the extent to which students form attachments with their peers and teaching staff, and *nature* that describes the importance of green spaces for the promotion of mental health and stress management.

Geographical Information Systems (GIS) tools and techniques can be utilized in universities for improving the built environment and fostering diversity and inclusion for students. For example, apps can be created which students can use to upload data about their experiences at different locations on campus. This crowdsourced data will enable inclusion/diversity committees to make informed decisions about the planning, design, and management of the built environment. Furthermore, maps can be created to showcase general locations on campuses where students can be comfortable and find activities which appeal to them.

Conclusion

In conclusion, we suggest several best practices for advancing diversity in engineering education, wherein traditionally, emphasis is placed on acquisition of technical competencies. While learning technology and new skills, students can use their designs and data to create compelling narratives. They also find great value in informal and diverse interaction. An awareness of the class structure and composition together with intentional instructor practices such as differentiated instruction, incorporating diverse cultures, creating a safe space, and targeting the affective domain are all key strategies in creating a diverse and inclusive classroom. Being aware of technology limitations is also key, and supporting and scaffolding students as they present their unique narratives and perspectives.

It is our hope that this case study will increase the success stories of using technology to foster inclusion and diversity in education where student voice is not traditionally highlighted, but the focus is placed mainly on technical skill acquisition. Within STEM, educators can increase opportunities for inclusion and diversity in the classroom by providing avenues for student input, highlighting student narratives, promoting student interaction, using instructional design strategies and domain-specific technologies.

References

Anderson, J. A., & Adams, M. (1992). Acknowledging the learning styles of diverse student populations: Implications for instructional design. *New Directions for Teaching and Learning, 1992*(49), 19–33. https://doi.org/10.1002/tl.37219924904

Bandura, A. (2002). Social cognitive theory in cultural context. *Applied Psychology, 51*(2), 269–290. https://doi.org/10.1111/1464-0597.00092

Brown, D. S., McCrackin, J., Cairns, J., & Stirling, M. (2018, October). Using GIS as a cross-curricular vehicle for student learning. In *E-Learn: World conference on e-learning in corporate, government, healthcare, and higher education* (pp. 636–641). Association for the Advancement of Computing in Education (AACE).

Capretz, L. F., & Ahmed, F. (2010). Why do we need personality diversity in software engineering? *Software Engineering Notes, 35*(2), 1–11. https://doi.org/10.1145/1734103.1734111

Commission for Architecture and the Built Environment (CABE). (2008). *Inclusion by design. Equality, diversity, and the built environment*. https://www.designcouncil.org.uk/sites/default/files/asset/document/inclusion-by-design.pdf

Cope, M. P., Mikhailova, E. A., Post, C. J., Schlautman, M. A., & Carbajales-Dale, P. (2018). Developing and evaluating an ESRI story map as an educational tool. *Natural Sciences Education, 47*(1), 1–9.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A. J., & Sheikh, A. (2011). The case study approach. *BMC Medical Research Methodology, 11*(1), 100–100. https://doi.org/10.1186/1471-2288-11-100

Frechette, C., Layne, L. C., & Gunawardena, C. N. (2014). Accounting for culture in instructional design. In I. Jung & C. N. Gunawardena (Eds.), *Culture and online learning: Global perspectives and research*. Stylus Publishing, LLC.

Gunawardena, C. N., Ortegano-Layne, L., Carabajal, K., Frechette, C., Lindemann, K., & Jennings, B. (2006). New model, new strategies: Instructional design for building online wisdom communities. *Distance Education, 27*(2), 217–232.

Gunawardena, C., Frechette, C., & Layne, L. (2018). *Culturally inclusive instructional design: A framework and guide to building online wisdom communities*. Routledge.

Gurin, P., Dey, E., Hurtado, S., & Gurin, G. (2002). Diversity and higher education: Theory and impact on educational outcomes. *Harvard Educational Review, 72*(3), 330–367.

Hamilton, M., & Weiss, M. (2005). *Children tell stories: Teaching and using storytelling in the classroom*. Richard C Owen Pub.

Hatch, J. A. (2002). *Doing qualitative research in education settings*. Suny Press.

Heaster-Ekholm, K. (2020). Popular instructional design models: Their theoretical roots and cultural considerations. *International Journal of Education and Development using Information and Communication Technology, 16*(3), 50–65.

Henderson, L. (1996). Instructional design of interactive multimedia: A cultural critique. *Educational Technology Research and Development, 44*(4), 85–104.

Jung, I., & Gunawardena, C. N. (Eds.). (2015). *Culture and online learning: Global perspectives and research*. Stylus Publishing.

Kerski, J. J. (2020). Teaching about food and agriculture using web mapping tools and spatial data. *The Geography Teacher, 17*(3), 87–93.

Kumar, R., Zusho, A., & Bondie, R. (2018). Weaving cultural relevance and achievement motivation into inclusive classroom cultures. *Educational Psychologist, 53*(2), 78–96.

Liu, S., & Zhu, X. (2008). Designing a structured and interactive learning environment based on GIS for secondary geography education. *Journal of Geography, 107*(1), 12–19.

Lowyck, J. (2014). Bridging learning theories and technology-enhanced environments: A critical appraisal of its history. In *Handbook of research on educational communications and technology* (pp. 3–20). Springer.

Marta, M., & Osso, P. (2015). Story maps at school: Teaching and learning stories with maps. *J-Reading – Journal of Research and Didactics in Geography, 2*, 61–68.

Mishna, F., & Bogo, M. (2007). Reflective practice in contemporary social work classrooms. *Journal of Social Work Education, 43*(3), 529–544.

Moore, M. G., & Anderson, W. G. (2003). *Handbook of distance education*. Lawrence Earlbaum Associates.

Mulrooney, H. M., & Kelly, A. F. (2020). The university campus and a sense of belonging: What do students think? *New Directions in the Teaching of Physical Sciences, 15*(1), 1.

Pike, G. R., & Kuh, G. D. (2006). Relationships among structural diversity, informal peer interactions, and perceptions of the campus environment. *The Review of Higher Education, 29*(4), 425–450.

Pulsinelli, A., & Roubie, C. (2001). Using diversity modeling for instructional design. *Performance Improvement, 40*(7), 20–27.

Rogers, P. C., Graham, C. R., & Mayes, C. T. (2007). Cultural competence and instructional design: Exploration research into the delivery of online instruction cross-culturally. *Educational Technology Research and Development, 55*(2), 197–217.

Strachan, C., & Mitchell, J. (2014). Teachers' perceptions of Esri Story Maps as effective teaching tools. *Review of International Geographical Education Online, 4*(3), 195–220.

Strayhorn, T. L. (2012). Satisfaction and retention among African American men at two-year community colleges. *Community College Journal of Research and Practice, 36*(5), 358–375.

Strayhorn, T. L. (2021). Exploring ethnic minority first-year college students' well-being and sense of belonging: A qualitative investigation of a brief intervention. *American Journal of Qualitative Research, 6*(1), 42–58.

Sui, D. (2014). Opportunities and impediments for open GIS. *Transactions in GIS, 18*(1), 1–24.

Tate, W. (1997). Race-ethnicity, SES, gender, and language proficiency trends in mathematics achievement: An update. *Journal for Research in Mathematics Education, 28*(6), 652–679.

Wang, S., & Zhan, H. (2010). Enhancing teaching and learning with digital storytelling. *International Journal of Information and Communication Technology Education (IJICTE), 6*(2), 76–87.

Wlodkowski, R. J., & Ginsberg, M. B. (1995). *Diversity & motivation: Culturally responsive teaching* (Jossey-Bass Higher and Adult Education Series. Jossey-Bass Education Series, Jossey-Bass Social and Behavioral Science Series). Jossey-Bass Inc.

Wulf, W. W. (2001). Diversity in engineering. *Leadership and Management in Engineering, 1*(4), 31–35.

Young, P. A. (2008). The culture based model: Constructing a model of culture. *Journal of Educational Technology & Society, 11*(2), 107–118.

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This book was inadvertently published with Dr. Rita Fennelly-Atkinson's name as Rita Fennelly-Atkinso in Chapter 8. It has now been corrected to reflect as Rita Fennelly-Atkinson.

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