



PALGRAVE STUDIES IN
EDUCATIONAL FUTURES

Global Media Arts Education

Mapping Global Perspectives
of Media Arts in Education

Edited by
Aaron D. Knochel · Osamu Sahara

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Palgrave Studies in Educational Futures

Series Editor

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The series Educational Futures would be a call on all aspects of education, not only specific subject specialists, but policy makers, religious education leaders, curriculum theorists, and those involved in shaping the educational imagination through its foundations and both psychoanalytical and psychological investments with youth to address this extraordinary precarity and anxiety that is continually rising as things do not get better but worsen. A global de-territorialization is taking place, and new voices and visions need to be seen and heard. The series would address the following questions and concerns. The three key signifiers of the book series title address this state of risk and emergency:

1. **The Anthropocene:** The ‘human world,’ the world-for-us is drifting toward a global situation where human extinction is not out of the question due to economic industrialization and overdevelopment, as well as the exponential growth of global population. How to we address this ecologically and educationally to still make a difference?
2. **Ecology:** What might be ways of re-thinking our relationships with the non-human forms of existence and in-human forms of artificial intelligence that have emerged? Are there possibilities to rework the ecological imagination educationally from its over-romanticized view of Nature, as many have argued: Nature and culture are no longer tenable separate signifiers. Can teachers and professors address the ideas that surround differentiated subjectivity where agency is no long attributed to the ‘human’ alone?
3. **Aesthetic Imaginaries:** What are the creative responses that can fabulate aesthetic imaginaries that are viable in specific contexts where the emergent ideas, which are able to gather heterogeneous elements together to present projects that address the two former descriptors: the Anthropocene and the every changing modulating ecologies. Can educators drawn on these aesthetic imaginaries to offer exploratory hope for what is a changing globe that is in constant crisis?

The series Educational Futures: Anthropocene, Ecology, and Aesthetic Imaginaries attempts to secure manuscripts that are aware of the precarity that reverberates throughout all life, and attempts to explore and experiment to develop an educational imagination which, at the very least, makes conscious what is a dire situation.

Aaron D. Knochel • Osamu Sahara
Editors

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Praise for *Global Media Arts Education*

“In this resilient and democratic collection of research-grounded educational practice, authors offer inspiring ideas for learners on various levels of digital abundance or deprivation, showing how media arts may be integrated in an educational ecosystem that fosters freedom of expression and develops life skills through an optimal synergy of contemporary media arts endeavors and school-scaffolded creativity.”

—Andrea Kárpáti, *Corvinus University Budapest, and UNESCO Chair for Multimedia in Education*

“Knochel and Sahara have pulled off a remarkable feat of mapping the state of media arts in education by bringing together the voices of international experts. If you’re interested in the interconnectedness of technology, media, arts and education, make a space on your bookshelf for this.”

—Glen Coutts, *Professor, University of Lapland, Finland, and President, International Society for Education through Art*

“This book is a unique theoretical work, written by researchers in the field of arts education, illuminating new paths to the real understanding of the function of media and future-oriented educational reform.”

—Asahiko Yamaki, *Special Professor, Naruto University of Education, Japan, and President, Japanese Association of Art Education*

“Much of current digital media research and practice in art education tends to focus on North American perspectives. In a welcome response to this trend, Knochel and Sahara have thoughtfully assembled in *Global Media Arts Education* a timely and significant expansion of the current discourse to include new forms of knowledge and critical processes of making art with new and digital media.”

—Juan Carlos Castro, *Chair, Department of Art Education, Concordia University, Canada*

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ABBREVIATIONS

3DCG	Three-dimensional computer graphics
ABC	Animation Boot Camp
AI	Artificial intelligence
ANT	Actor-network theory
Anti-ELAB	Anti-Extradition Law Amendment Bill
APECV	Portuguese Association for Teachers of Visual Expression and Communication
AR	Augmented reality
AS	Artificial stupidity
BA5	Brodmann area 5
BA7	Brodmann area 7
BJP	Bharatiya Janata Party
CAA	Citizenship Amendment Act
CE	Common Era
CEC	Central Education Council
CEFRVL	Common European Framework of Reference for Visual Literacy
CMC	Cultural Media Center
CNC	Computer numerical control
CSS	Cascading Style Sheets
DeSeCo	Definition and Selection of Competencies: Theoretical and Conceptual Foundations
DigComp	European Digital Competence Framework for Citizens
DigCompEdu	European Framework for the Digital Competence of Educators
DMAD	Doutoramento em Média-Arte Digital
EACEA	Education, Audiovisual & Culture Executive Agency

E.A.T.	Experiments in Arts and Technology
FAAMG	Facebook, Amazon, Apple, Microsoft, and Google
fl.	<i>flōruit</i> (flourished)
GAN	Generative adversarial network
GPT-3	Generative Pre-trained Transformer 3
HTML	Hypertext markup language
IAMAS	International Academy of Media Arts and Sciences; later, Institute of Advanced Media Arts and Sciences
ICEFA Lidice	International Children's Exhibition of Fine Arts Lidice
ICT	Information and communication technology
IDEA	International Drama/Theatre and Education Association
IEA	International Association for the Evaluation of Educational Achievement
IEAIED	Institute for Ethical AI in Education
IEP	Individual education program
InSEA	International Society for Education Through Art
IoT	Internet of Things
IRCAM	Institut de Recherche et Coordination Acoustique/Musique
ISDN	Integrated services digital network
ISME	International Society for Music Education
JNU	Jawaharlal Nehru University
K-12	Kindergarten to grade 12
K-16	Kindergarten to senior-level undergraduate university degrees
LEA	Local educational agency
LGBTQ+	[for LGBTTTQQAAP]
LGBTTTQQAAP	Lesbian, Gay, Bisexual, Transgender, Transexual, Queer, Questioning, Intersex, Ally, Asexual, and Pansexual
LOMLOE	Ley Orgánica de Modificación de la LOE
MEXT	Ministry of Education, Culture, Sports, Science and Technology
ML	Machine learning
MOE	Ministry of Education
MTSU	Middle Tennessee State University
NCCAS	National Coalition for Core Arts Standards
NEA	National Endowment for the Arts
NIRS	Near-infrared spectroscopy
NIST	National Institute of Standards and Technology
NRC	National Register of Citizens
<i>N'TOO</i>	<i>Not the Only One</i>
OCR	Optical character recognition
OECD	Organisation for Economic Co-operation and Development

P21	Partnership for 21st Century Skills
PD	Professional development
PISA	Programme for International Student Assessment
RCIC	Research Center for Industrial Cultures
RSS	Really Simple Syndication
SAMR	Substitution Augmentation Modification Redefinition
SDG	Sustainable Development Goal
SEM	Structural equation modeling
SRL	Self-regulated learning
STEAM	Science, technology, engineering, arts, and mathematics
STEM	Science, technology, engineering, and math
TaiK	University of Art and Design Helsinki [in Finnish]
TIMSS	Trends in International Mathematics and Science Study
TSB	Tennessee School for the Blind
UIAH	University of Art and Design Helsinki
ULL	Universidad de La Laguna
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
US	United States
UX	User experience
vlog	Video blog
vlogger	Video blogger
vlogging	Video blogging
VR	Virtual reality
V-TISK	Visually triggered ideated somatic knowledge
YCAM	Yamaguchi Center for Arts and Media

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Introduction

Aaron D. Knochel and Osamu Sahara

Sitting in a hotel lobby in Hong Kong after arriving for an international conference for art education researchers in 2018, we found our conversation quickly circled around similar interests: innovations in network computing, intrigue concerning art and science practices, and a fascination with contemporary new media artists. Despite our geographic separation, we were somehow doing very similar work. However, what was also clear was that our research on technology and art education was constructed within very different sociocultural landscapes leading to different policy environments, education systems, and values. We questioned the status of this type of research when considered on a global scale, asking: What is the global media arts?

Our first meeting happened in late 2018 well before the COVID-19 pandemic was to radically impact our lives and work (including the work of this collection). Among other things, the pandemic has highlighted a global digital communication network that permeates our commercial and social transactions. Take, for example, videoconferencing platforms.

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Zoom, a popular provider in this market, had ten million daily meeting participants in December 2019, which grew to three hundred million in April 2020 (Warren, 2020). The ever-increasing presence of digital networks, mobile computing, and software in our day-to-day lives has created a more technologically mediated world. While this is a worldwide phenomenon, engaging digital technologies is uneven due to the inequitable distribution of resources, accessibility issues, and forms of oppression that are perpetuated by algorithms (Noble, 2018). This collection focuses on a critical examination of how digital technologies are engaged in art education on a global scale, or what we call “global media arts.” We use the term media arts to define a set of artistic practices that use electronic, especially digital, forms of technologies as artistic materials and processes for creative and meaningful expression.

Defining the media arts is an important first step in understanding this diverse space of practice. There is little disagreement that digital technologies impact the whole of education, but focusing on the media arts attends to artistic practice and its relation to media. As a baseline, we provide a definition from the National Endowment for the Arts (NEA, 2021), a prominent arts advocacy organization in the United States (US), which states:

Media arts is defined by all genres and forms that use electronic media, film and technology (analog & digital; old and new) as an artistic medium or a medium to broaden arts appreciation and awareness of any discipline. For example, this includes projects presented via film, television, radio, audio, video, the internet, interactive and mobile technologies, video games, immersive and multi-platform storytelling, and satellite streaming. (p. 105)

Notably, the NEA (2021) asserts two points of orientation. First, that media employed in the media arts is a diverse ecosystem mixing old and new. Second, that the implication of media is conceptualized as the very substance of the practice, similar to the ways that paint and clay characterize the material practices of painters and ceramicists, respectively. These are important distinctions that need further explication.

What’s significant in paying attention to old and new technologies in building research in media arts is counteracting the perceptions of endless innovation and the new. The obsolescence narrative of technology pervades its marketing and commercialization, obfuscating a deeper understanding of the nuances of technological emergence. Avoiding this

hyperbole by conceptualizing media arts practices as movements more akin to ecological shifts as opposed to revolutions, we feel, helps to better unveil its affordances. Despite the rhetoric of the new, technologies—especially the digitalization of media technologies—often take root in analogic predecessors that create trajectories of practice that are informed by resources and access in similar ways to how ecosystems evolve over time as interrelationships of acting forces react to nutrients within market forces such as the availability of raw materials.

Ecological perspectives are present in efforts by media theorists to create continuities within technological histories. Jay David Bolter and David Grusin (1998) establish the principle of remediation to reflect the complex ways that newer media may be mapped back onto previous forms of media through forms of repurposing that implicate the claims to the new. Bolter and Grusin (1998) state, “Repurposing as remediation is both what is ‘unique to digital worlds’ and what denies the possibility of that uniqueness” (p. 50). Modes of theorizing remediation can be perceived as well in European threads of media archeology, such as those from Jussi Parikka (2012) and Erkki Huhtamo (2013), which pursue theoretical examinations of the emergence of media technologies within material, historical, and transdisciplinary perspectives that are often imaginative and speculative in nature. These perspectives provide historical trajectories of technological innovations that invite connection to the social and political landscapes that contextualize technological use and ultimately shape its impact on the arts and learning.

Ecological perspectives of technological advances also highlight the seeming ubiquity of computational systems and its *everywhereness* in cultural practices of art and design. Moving beyond notions of remediation, we may contemplate this pervasiveness through theorizations of possible post-conditions, including post-media (Quaranta, 2013; Weibel, 2012), post-medium (Krauss, 1999; Manovich, 2001), and post-internet (Olson, 2011; Vierkant, 2010), to gain insight as to the immanent qualities of computational systems impacting creative practice and learning in the arts. These post-conditions, although not wholly coherent or consistent discourses that can easily be collapsed, tend to contemplate the elasticity of cultural expression and its traceable fluidity in the metadata of network systems that impact its meaning and its materiality. These theories contemplate historical trajectory similar to remedial thought, as in “post” literally means to come after, but extend conceptualization of creative practice within a territory of code and connectivity that is totalizing. All

artmaking is post-internet whether it is within the framing of media arts or not.

The hazard with the post-internet conception is that while it helps to contemplate issues of connectivity, materiality, and meaning, it may also make a focus on media arts within our endeavor difficult. After all, if all art is post-internet, could not a painting be considered media art? While we do feel these speculations on artistic practice are important, in this collection we pull back from this totalizing effect to gain perspective on the media arts as it is practiced in schools and informal arts learning to engage more explicitly in the challenges and opportunities that are a part of engaging media technology within learning contexts. Our approach parallels the discourse of new media in art and curatorial contexts, which attempts to carve out a space to contemplate artists working in modes that intervene and invent social, political, and cultural economies of practice using technological systems. Our focus on media arts, and its applications and engagement within education, helps to ground research within this collection on issues related to connected learning, creative inquiry, and forms of material exploration within arts learning that involve technological systems.

CONSIDERING THE NECESSITY OF GLOBAL MEDIA ARTS EDUCATION

Who would have expected the world situation to change so much after we finished the 2018 Hong Kong conference? The turmoil created by a combination of political forces, social uprisings, and a once-in-a-century pandemic has elevated uncertainty around the globe. It is not hard to imagine that educators, researchers, and artists worldwide are contemplating what role creative expression, education, and technology may play within the dynamics of our interconnected world.

Thinking globally in social science and humanities scholarship escalated in the 1980s and 1990s, with discourses of globalization leading to global studies today (Nederveen Pieterse, 2013). While threads of globalization inquiry remain situated within disciplinary foci, global studies has emerged as a highly interdisciplinary field that contends with immense troves of data accumulated through economic and social systems that conflate, challenge, and redistribute more traditional orientations to nation-states and geographic borders. Importantly, global perspectives in art education

scholarship have expanded, as well evidenced by recent edited collections. Editors Georgina Barton and Margaret Baguley's (2017) *The Palgrave Handbook of Global Arts Education* offers an extensive collection that addresses a range of contemporary issues related to arts education across the world, but does not focus on the media arts. Editors Belinha S. De Abreu et al.'s (2017) *International Handbook of Media Literacy Education* examines the theoretical, conceptual, pedagogical, and methodological development of media literacy education and research around the world although not explicitly focused on the arts. Editors Marjorie Cohee Manifold et al.'s (2016) *Culturally Sensitive Art Education in a Global World: A Handbook for Teachers* offers a range of culturally sensitive teaching strategies appropriate to the arts with the media arts being a minor focus. Editors Mike Fleming, Liora Bresler, and John O'Toole's (2014) *The Routledge International Handbook of the Arts and Education* offers an authoritative guide to the main debates in the field of arts education and an informed account of contemporary developments in policy and practice with a chapter focused on the media arts. These titles offer a range of scholarship that builds global perspectives in arts education, but none of them attempt the explicit focus on media arts education that is central to the present collection. The confluence of global media and rise in creative digital practice that is an important part of our world suggests to us that the themes and authors gathered here provide a timely and unique contribution to this literature.

Perhaps growing out of our mutual involvement in the International Society for Education Through Art (InSEA), a nongovernmental organization and official partner of the United Nations Educational, Scientific and Cultural Organization (UNESCO), we begin our exploration of global affairs of media arts education with the constitution of this agency of the United Nations created in 1945 to counteract the terror and dehumanization of World War II. UNESCO's (1946) Constitution states:

That the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races; That the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute

a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern. (paras. 6–7)¹

Based on these values, it is crucial to understand how all people can contribute to a fair and sustainable society and achieve humankind’s cultural prosperity from the context of the media arts as a creative and productive force. However, only some countries have a well-developed technological infrastructure and a right to freedom of expression, which leaves the potential of the media arts to advance this “sacred duty” somewhat unclear.

In this project, we distributed an open call for abstracts to researchers and activists within our international networks, and what we saw in the process was the reality that many young learners and researchers lack technological resources and freedom of expression. The United Nations Children’s Fund (UNICEF, 2017) reported that nearly nine out of ten young people who do not currently use the internet live in Africa or the Asia and the Pacific (p. 45). The world is still defined by inequality, and educational technology and arts education are areas of emphasis that can possibly make a positive impact. UNICEF’s (2017) report *The State of the World’s Children 2017: Children in a Digital World* gives us critical reasons why we now need to think about what we can do in media arts education from a global perspective to meet the challenges of this century. The promise of technology for positive change appears equally balanced with its potential to increase economic disparities. The digital lives of the next generations will have an immense impact on economic and cultural development. We are cautious in suggesting that these issues of connectivity and access can be simplistically applied through geographic boundaries, as more granular analysis can highlight inequalities within countries that are supposedly leading the digital revolution. For example, according to the Pew Research Center, rural communities in the US continue to display lower levels of home broadband adoption and hardware, such as cell phones and laptop use, than their suburban and urban counterparts (Vogel, 2021). We believe the media arts have an important role to play here. Cutting-edge media arts education includes technologies employed in a range of expressive and creative production that can transform youth

¹We’d like to acknowledge that, like many documents of this period, the gendered language of this passage is limiting to its impact and representation of those constituents it is meant to empower.

engagement and have a dramatic potential to change lives if access is provided.

To begin to do this work, we start with our own contexts, the US and Japan, and then zoom out to sketch a landscape of policy and educational activities focused on the media arts. We follow this up with a discussion of the present collection and the thematic organization of the chapters.

MEDIA ARTS AND EDUCATIONAL POLICY IN THE US

In the US, forms of media arts education have been offered in educational settings since the rise of consumer electronics and desktop computers in the 1970s. Catalyzed by the availability of desktop computers and portable video recorders, kindergarten to grade 12 (K-12) public schools increased media arts offerings, depending upon staffing and budget availability. Today's hodgepodge of different disciplines writing and teaching mediacentric curricula is due to uneven funding across public schools and the uncertain credentialing of educators working in these emerging fields.

This hodgepodge is further exacerbated by state-level differences in certification, standards, and assessment. Standards within the media arts reflect this complexity in many ways. Local educational agencies (LEAs) take guidance from various learning standards, including the National Core Arts Standards in Media Arts, the Standards for Technological and Engineering Literacy, and the International Standards for Technology Education. Variations in standards adoption reflect teacher expertise, administrative influence, and funding, which create diverse emphases in how media arts programs are intended to impact student learning.

As the discipline developed and access to technology increased, early dominant forms of media arts education evolved from programs in television production often aligned with career and technical education initiatives. Advancements in software and computing power in the 1990s enabled greater expansion in graphic arts programs within visual arts departments. The advent of network and mobile computing, most notably manifest in smartphones and tablet hardware, accelerated media arts production in a broader range of humanities and arts-integrated curricula. Learning through media technologies is now commonplace within those locales that have the economic fortitude to stay abreast of the technology, but inaccessibility and inequitable distributions of resources are pervasive. Nevertheless, media arts curricula and programs are happening in nascent forms in many disciplinary areas of schooling.

Teachers working in media arts programs may be credentialed in areas of technology, visual art, performance arts, or humanities. The interdisciplinary nature of media arts requires collaboration between the disciplines, but often this diverse range of credentialing is more a symptom of slow adoption by state certification programs that cannot nimbly adapt to the fast pace of technological innovation in industry. Media arts offers a tremendous amount of learning opportunities to many disciplines. Music educators teach audio recording and postproduction. Theater and dance educators incorporate stage production, video projection, and video recording to share their works outside the theater. Visual art and design educators utilize graphics design, animation, and 3D modeling programs. Humanities educators can explore forms of electronic literature and video games. There has also been an increased interest in arts-integrated approaches to learning, often elevated by arts integration with science, technology, engineering, and math (STEM) subjects and maker education initiatives. Media arts has broad impact across school curricula due to its highly interdisciplinary nature.

MEDIA ARTS AND EDUCATIONAL POLICY IN JAPAN

In Japan, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) makes decisions about the curriculum through a fixed Course of Study, the term used for Japan's public school national curriculum, based upon a set of recommendations from the Central Education Council (CEC). MEXT creates a new Course of Study once every ten years. The OECD's Programme for International Student Assessment (PISA) and the International Association for the Evaluation of Educational Achievement's (IEA's) Trends in International Mathematics and Science Study (TIMSS) also influence this curriculum. Therefore, Japan uses a fairly strict set of curriculum goals, in contrast to the more distributed state-level guidelines used in the US.

In Japanese art education, the increase of informal learning, known as indirect experience, was one of the concerns leading to the inclusion of image media into the Course of Study for art education, announced by the Ministry of Education, Science, Sports and Culture in 1998. Co-editor Osamu Sahara (2020) describes it as follows:

In the mid-1980s, the sophistication of computer and network technology took off at a rapid pace. It was around that time that personal computers and computer games began to become part of the average home. This changing

environment developed visual culture more than ever before. Looking back a bit later at Japan's CEC discussion in the mid- '90s, we can see that experts were concerned about the possible adverse side effects of indirect experience through games and video, which they felt were perhaps too present in children's environment. It is within this developing context that in 1986 the Ministry of Education included Information and Communication Technology (ICT) for the first time as a fundamental skill within the Japanese national standards. Also, the Agency for Cultural Affairs within MEXT made a report regarding fundamental policy on the promotion of culture and the arts. The report encouraged cultivating media art creators. Since then, the Agency for Cultural Affairs (2002) has cooperated with art education by promoting media arts, including manga and illustration in public education. In the 1998 curriculum announcement, image media content was incorporated as part of the art education national curriculum at the junior high and [senior] high school levels for the first time. Image media content included, then and now, photos, video, computer-based content, manga, illustration, and intellectual property rights education. After this announcement of the national curriculum in 1998, a five-year preparation period was set, and then this curriculum was fully implemented in 2002. (pp. 23–24)

Since 1998, image media has been established as an area of Japanese art education. In addition, in the late 1980s, several art universities integrated image media into their courses, and in the late 1990s, higher education institutions specializing in media arts, such as the Institute of Advanced Media Arts and Sciences (IAMAS), appeared. In 2006, the first faculty specializing in manga was established at Kyoto Seika University, and in 2008 an animation course was established in the graduate school of film and new media at Tokyo University of the Arts. Media arts is also supported at a national level through the Japan Media Arts Festival that is held every year by the Agency for Cultural Affairs.

Japan has around a twenty-year history of teaching image media in art education. However, image media has not always been smoothly incorporated into art classrooms. In addition to budgetary constraints and technical difficulties in public schools, the incorporation of image media into traditional art education has not progressed. Generally speaking, Japanese art education aims to cultivate individuality and personal growth through self-expression, cultivating a child's individualization through self-formation. This child and creativity centered style of art education cultivates knowledge and aesthetic sensibility to help develop a zest for living

in Japan's youth. In respecting the educational philosophy underlying Japanese art education, the field of image media (*eizō media ryōiki*) is beholden to these objectives, often excluding innovations such as virtual reality (VR), 3D modeling, and artificial intelligence (AI), with a greater focus on video and interactive media arts in primary and secondary contexts.

GRASPING A GLOBAL PERSPECTIVE ON MEDIA ARTS EDUCATION

A global educational trend for the twenty-first century has been to equip the next generation with the ability to respond to the complexities and challenges of an unpredictable world. Media arts education also plays a part. The words that describe various abilities differ slightly depending on each country and researcher, but here we would like to use the “No-Ryoku” index, from the Japanese word *nōryoku* (ability). No-Ryoku expresses many types of ability—facility, literacy, skill, competency, potentiality, and capacity—defined by art education researcher Mitsuru Fujie (2007)² as follows:

- Facility is the ability that you have by nature.
- Skill is a practically earned ability to do your job or activity well.
- Literacy is the fundamental skill for your social life, including reading, writing, speaking, information, communication, and technologies.
- Competency is an important skill that is required for your job.
- Potentiality is the ability to reach a state that you have not yet reached.
- Capacity is the ability to expand the number of skills you can obtain.

In addition to this list, we provide the following graphic to help suggest how these abilities are related within the potential to accumulate and scaffold to more complex ability formations (see Fig. 1.1).

Many countries merge the cultivation of skills and competencies into their curricula at the national level. Competency-driven education is conceptualized in a framework by the Organisation for Economic Co-operation and Development (Rychen & Salganik, 2001) in its “Definition and Selection of Competencies: Theoretical and Conceptual Foundations”

²All quotations from Japanese in this chapter have been translated by co-author Osamu Sahara.

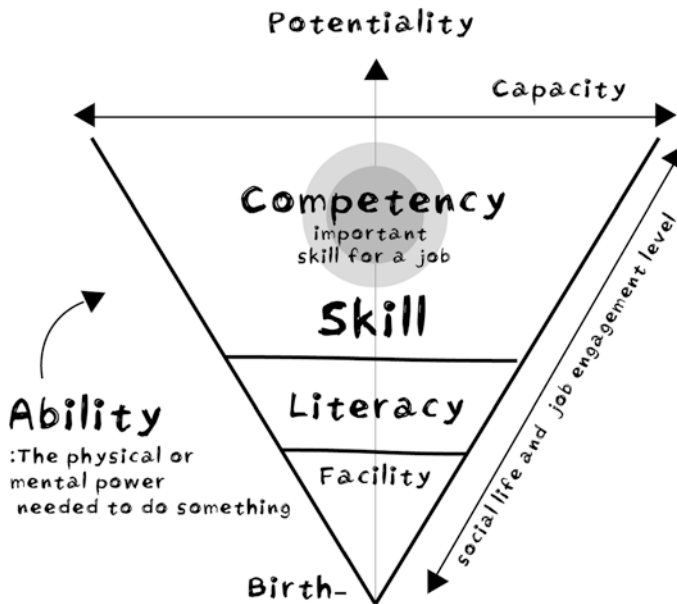


Fig. 1.1 Visualized concept of No-Ryoku (ability), based on Fujie (2007)

(DeSeCo). The DeSeCo goal is to outline competencies that may be needed to meet the challenges of contemporary society now and into the future. Education within this framework is perceived as an investment in youth, where economic and social returns are an important motivator in anticipating educational expenditures and tracking comparable outcome indicators across diverse contexts.

Art education also tends to follow these trends of skill and competency cultivation, elevating the media arts beyond vocational education strictly for economic development. For example, in Europe, there are competency-driven education policies focused on art education, such as the Common European Framework of Reference for Visual Literacy (CEFRVL; Wagner & Schönau, 2016). In the US, these movements are mirrored in establishing the arts curriculum of twenty-first-century skills initiated by the Partnership for Twenty-first Century Skills (now the Partnership for Twenty-first Century Learning, or P21), a changing consortium of private industry and education policymakers and educators, which positions the arts as one of the core subjects.

In parallel with these global educational reform movements, UNESCO emphasizes the usefulness of arts education and its importance in general education. Since the International Appeal for the Promotion of Arts Education and Creativity at School was announced in 1999, UNESCO organized the World Conference on Arts Education in 2006 and 2010 through a collaboration of professional education organizations, including InSEA, the International Society for Music Education (ISME), and the International Drama/Theatre and Education Association (IDEA). Through these conferences, UNESCO announced a request to position arts education at the core of international policy agendas aimed at sustainable development and transformation of society. UNESCO (2006) released the “Road Map for Arts Education,” advocating for the inclusion of digital arts and media in the field of arts education. Furthermore, at the UNESCO-sponsored World Conference in 2010, the “Seoul Agenda: Goals for the Development of Arts Education” was released, advocating for policies and resources to ensure sustainable access to interdisciplinary arts experiences, including digital and other emerging art forms both in and out of school (UNESCO, 2010).

The inclusion of media arts into general education is progressing on a global scale as well. According to a survey by the Education, Audiovisual & Culture Executive Agency (EACEA) in 2009, eight countries in Europe have made media arts compulsory in their national curriculum, and three countries have made it semi-compulsory. There are five countries where media arts is integrated among other subjects. In the US, the National Coalition for Core Arts Standards (NCCAS) included the media arts as a distinct category in its proposed national arts curriculum from 2014. In Japan, the media arts, referred to as image media, has been included in the national curriculum as part of art education since 1998. In Australia, a media arts curriculum was included in the national curriculum in 2016. The trend of global educational transformation is accelerating the expansion of media arts education for primary, secondary, and higher education. Further, it is no exaggeration to say that InSEA, ISME, IDEA, UNESCO, OECD, and other global organizations have greatly influenced this expansion.

GUIDING THEMES IN THE COLLECTION

We agree with, and to a large extent the authors in this collection illustrate, the OECD statement that “digital technology offers entirely new answers to the question of what people learn, how they learn, and where and when they learn” (Schleicher, 2020, p. 16). Research related to media arts education constantly asks what can be done to address the challenges of the present and speculate on those of the future. To contribute to this speculation, our challenge for this collection was to develop coherent themes to organize some of the trends that we perceived within the field of practice. In the early stages of organizing the chapters of this book, we used an inductive process of concept mapping to group the authors’ keywords, refining these groupings into larger thematic trends that we discerned across the chapters (Fig. 1.2). Ultimately, this method led to four thematic core sections: activism, reframing, engaging difference, and contextualizing. The following is an overview of the sections and the chapters.

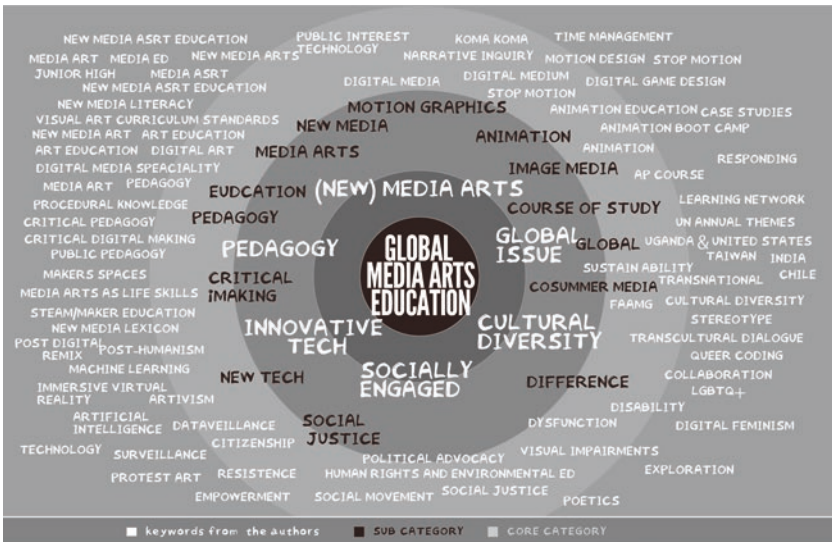


Fig. 1.2 Concept mapping of the keywords and core themes of the chapters in the collection

*Part I. Activism in Global Media Arts: Political Mediascapes
and Speaking Back to Power*

The activism section highlights modes of expression in the media arts that reflect its power of expression and technological advantages in network communication. The media arts are an effective activist tool not only because of the modalities of messages that can be created, but also because of the very connectivity that is enabled through digital communication and the internet. Authors in this section take up a range of contemporary social and political events that have catalyzed media arts practitioners to respond, intervene, and act out using the creative skills and communication networks that digital systems afford. Educational framing in this section is often focused on informal contexts where communities of practice leverage self-learning and community sharing to build activist abilities and capacity to speak back to power. Keywords such as social justice, protest art, human rights, and resistance are important themes here.

The opening chapters focus on the media arts in the midst of tumultuous world affairs as they are variously employed within social and political turmoil. Lee Cheng's "Media Arts as Political Advocacy in Hong Kong's Social Movements" reviews the use of media arts as propaganda by both the pro-establishment and pro-democracy parties in Hong Kong in the Anti-Extradition Law Amendment Bill movement of 2019–2020. Cheng focuses on the expanding role of the media arts, together with that of social media and instant messaging platforms, to augment political advocacy through creative practice and the co-creation of symbolic artifacts by netizens. The use of the media arts as a powerful form of expression within a social movement can also be seen in Claudia Sanhueza and Alvaro Jordán's "Back to the People: Transforming the Role of Media Arts in the Context of the Chilean Social Uprising of October 2019." These Chilean authors provide a brief contextualization of the Chilean mass mobilization of 2019 and review transformations in the Chilean media arts in terms of its formal and physical accessibility and production modes. Sanhueza and Jordán reflect on the new role of Chilean media arts, connecting it to public pedagogy, art education, public art, and "artivism." Manisha Sharma takes a different focus with her "Patriotism and Nationalism: Sounds of Dissent and Resistance in Contemporary India." Sharma describes the sociopolitical turmoil of contemporary India through the analysis of poetic protest and activism from India, focusing on rap and hip-hop influenced by traditional music. Sharma advocates for media arts

education by examining how to engage students in dialogue with current sociopolitical events through social media and technologies, toward a more global understanding of artistic and political awareness by means of the call-and-response method evident in these social technologies and hybrid music forms.

The final two chapters in this section look more to specific platforms and corporations within the landscape of network and social technologies to ponder issues of expression, resistance, and algorithmic control. Ryan Patton's "Disruption, Innovation, Creativity, and the 'Right Thing' in the Age of Global Media Arts" describes how the platforms of the big five tech firms—Facebook, Amazon, Apple, Microsoft, and Google (FAAMG)³—have made de-democratization central to their global media pursuits. Patton asks how learners and users grapple with their relationships with these megacorporations when they control massive amounts of user data worldwide. He speculates on how art educators may engage with these ubiquitous technology platforms in ways that are cognizant, critical, and possibly subversive. Co-editor Aaron Knochel's "Zooming In: Learning with Videoconferencing as Posthuman Pedagogy" explores shifts in global communication through the rapid adoption of videoconferencing starting during the pandemic in 2020, which introduced new forms of augmented human interaction in education, opening up new and sometimes troubling impacts to curriculum and instruction. Knochel perceives Zoom as performing pedagogical acts that introduce stressors to the body often referred to as Zoom fatigue, create unique and augmented cinematic events that may lead to terror, and repeat larger trends in algorithmic bias that affects the access of all users. He analyzes how these technologies introduce pedagogical formations that augment the assemblage of learning, asking how we account for these curricular impacts and what they mean for the media arts.

³We'd like to acknowledge, along with Patton, that FAAMG is a political and sociocultural discourse that explores and is critical of the impacts of these large multinational information and communication technology companies, even though the acronym is starting to become dated as corporate structures and branding reorganize under different names such as Alphabet and Meta Platforms.

*Part II. Reframing Global Media Arts: Theorizing Innovation
in New Media*

Reframing focuses on the ways that the media arts as an expressive form requires ongoing theoretical reassessment as technologies evolve. Authors in this section approach a range of educational issues by analyzing and speculating on the impact of technological innovation as it augments human relations in learning and beyond. Keywords in this section include new media, critical digital making, post-digital, and dysfunction.

Robert W. Sweeny's "Digital Making, Digital Breaking: Technological Dysfunction and a Postdigital Art Education" analyzes the role of dysfunction as a productive force that is a part of all engagement with technologies. Sweeny suggests that technological dysfunction, as represented in post-digital art practices, can point to opportunities to rethink the incorporation of digital media in a variety of art educational settings. Richard Jochum's "Emerging Technologies in Art Education: What If I Don't Want To?" examines the inclusion of emerging technologies by reflecting on the adoption of past innovations such as video blogging from the emergence of Web 2.0. Jochum examines both his own adoption of these innovations by attending to the lessons learned for emerging practices in art education that engender both enthusiasm and resistance among art students and teachers. Teresa Torres de Eça and Ângela Saldanha, in their chapter "Digital Media and Art Education: The European Digital Competence Framework," also analyze how art educators engage with technologies by reflecting on the OECD's (2018) position paper's list of skills and competencies deemed essential in the approaching decade. Torres de Eça and Saldanha focus on digital environments of learning and self-learning to reframe the need to include more procedural strategies in schools to prepare students as agents of change within a discussion about media arts, ecological networks, and arts education. Co-editor Osamu Sahara's "The Significance of Media Arts Education from a Cognitive Science Approach" reframes media arts education by synthesizing scholarship in cognitive science. Extending previous research, Sahara shows that connecting bodily sense and visual images through interactive manipulation will ideate somatic perception, raising students' interest in visual images and their perception of reality. Sahara clarifies how visual stimuli activate tactile sensations in our brains and how this is related to visual image manipulation.

The section shifts to a focus on the impact of AI, which appears to be a major reframing of computational systems in the twenty-first century. Tomi Slotte Dufva's "Entanglements in AI Art" provides a critical perspective on the use of AI in art by looking at AI from a feminist phenomenological stance and focusing on how AI is entangled in digital and physical processes. Patti Pente, Catherine Adams, and Connie Yuen's "Artificial Intelligence, Ethics, and Art Education in a Posthuman World" explores potential intersections between the growing emergence of AI in society and art education. Their research addresses potential implications for global media arts grounded in posthumanism, a theoretical frame where the entanglement of human-nonhuman relations requires an examination of the nature of agency.

Part III. Engaging Difference in Global Media Arts: Cultural Diversity and Empowerment

Engaging difference focuses on the ways that media arts practices are used to inform, reflect, and empower difference as an element of cultural value in society and education. Culturally responsive teaching opens pathways for students and their differences to be important contributing factors to curriculum and the formulation of pedagogical strategies. Learning in the media arts in this sense elevates difference as productive and opposed to the implicit oppression of homogenizing standardization. Keywords such as cultural diversity, collaboration, transcultural dialogue, and empowerment are important themes here.

Kevin Hsieh and Meng-jung Yang's "Decoding Stereotypes in Child-Oriented Media toward LGBTQ+: Preservice Art Teachers' Perspectives" describes a project with thirty-five preservice art teachers on decoding stereotypes of LGBTQ+ people within popular media by designing cartoon characters that counter these assumptions. Hsieh and Yang's project utilizes this design process to engage future teachers in creative practice that involves reflecting on one's own assumptions and unconscious bias. Noemí Peña Sánchez's "Creating Social Dialogues through a Media Art Education Project in the Canary Islands" takes a similar tack with a different range of social justice issues using animation. Peña Sánchez's project uses digital and interactive technologies to explore critical issues of social justice such as gender, disability, and multiculturalism through stop-motion animations.

The section shifts from these self-contained classroom explorations to explore engaging difference through a more collaborative project space whereby two learning communities join together in creative and cultural exchange. Debrah C. Sickler-Voigt's "Media Arts and Assistive Technologies as Empowering Global Communication Tools for Students with Visual Impairments" describes a project in which schoolchildren from a state school for the blind create stop-motion animations with pre-service teachers. Schoolchildren use tactile visuals, sound effects, moving images, and assistive technologies to create animations inspired by the impacts of climate change and the need for access to clean water. Karen Keifer-Boyd and Richard Kabiito's "Uganda-US Creative Collaborations in Media Arts" reviews an ongoing collaboration between two university professors that has taken multiple manifestations over their twenty-plus-year collaboration. Keifer-Boyd and Kabiito, in the US and Uganda, respectively, reflect on their facilitation of dialogic arts-based projects between their students beginning in 2007.

Part IV. Contextualizing Global Media Arts: Case Studies in Pedagogy

The final section of the collection presents an array of educational contexts within media arts from around the globe, which reflects on the complexity of place, time, and materials in endeavors of learning and pedagogy. These case studies in pedagogy discuss issues of standards integration and considerations for curricular emphasis and expansion that highlight the range of possibilities taking shape in different sociopolitical contexts with their particular histories and policy landscapes. Keywords such as art education policy, visual art curriculum standards, and pedagogy are important themes here.

The section pairs chapters from two specific contexts—Taiwan and Japan—from different perspectives, which help to flesh out the complexities of global and local interactions in media arts education. The first pairing comes from Taiwan. Yu-Hsiang Chen and Christine Liao's "Case Studies of High School Art Teachers' Perceptions of Media Arts Teaching under the New Arts Curriculum Guidelines in Taiwan" develops case studies of teacher practice utilizing technology in artmaking as emphasized in Taiwan's 2018 arts curriculum standards. Chen and Liao explore how art teachers' perceptions toward implementing media arts teaching have important impacts on the success of the new standards. Yichien

Cooper’s “Time Management in Media Arts Education: Stories from Taiwan” continues this focus on Taiwan by exploring the limitation of time and its impact on teachers making new media accessible. Cooper investigates the complexity of time management and its impact on teaching and interdisciplinary learning in science, technology, engineering, arts, and mathematics (STEAM) and makerspace settings, using a narrative inquiry of five Taiwanese media arts educators’ perspectives and experiences.

The section then shifts to two chapters from the context of Japan. Taruto Fuyama’s “The Meaning of Animating in the Digital Era: Animation Education Practice in Japan” introduces practical examples of animation education and production in Japan. Fuyama’s discussion reframes these examples in terms of the practice of animating, as a process of make-believe using motion, to consider the significance of animating for art education as a practice that encourages understanding others and feeling connected with the world. From this particular focus on animation, Masayuki Akamatsu and Jean-Marc Pelletier’s “New Media Arts Education at the Institute of Advanced Media Arts and Sciences” tells the story of IAMAS, which was established in 1996 as one of the first educational institutions for new media arts in Japan. It reviews the history of IAMAS from its early years, exploring the creative and artistic possibilities of cutting-edge technology to reflect on sustaining a curriculum that adopts new technology rapidly in an ad hoc fashion. Akamatsu and Pelletier suggest that while a focus on adopting innovative technology builds skill, it is paramount for institutions in media arts education to focus on training in a procedural type of knowledge that is adaptable to changing eras. IAMAS, as a very influential institution of media arts education in Japan, provides an example of an institutional context that, like the technologies in focus, has experienced massive change and adaptation over time.

A MAPPING, NOT A GEOGRAPHY

Our intention with the collection is to begin a discussion that embarks on an unknown trajectory of exploration as to the global impact of the media arts and its mark on educational spaces, both formal and informal. We refer to this process as a mapping as opposed to a geography, because focusing on geographies and borders within global studies, we feel, obscures the very space-bending capabilities of network communication and occludes how creative expression within these spaces can flexibly

impact local and global contexts. Just as multinational technology corporations move through economic systems with regard and disregard for national sovereignty, we too feel scholarship in media arts should generate tentative boundaries, navigate fragile frameworks of sociopolitical policy agendas, and stay tuned to the emergent formation of abilities characteristic of the media arts themselves. This work does not come freely. We encountered pandemic interruptions to our bringing this collection together. We also had to navigate difficult negotiations of academic freedom as one team of submitting authors from China withdrew from the project due to fears of being associated with scholarship focusing on activism in media arts, particularly the chapter focused on Hong Kong. In the end, we know this collection to be the beginning of a much larger mapping project, possibly without destination, but aiming to understand the ever-changing landscape.

WAYFINDERS: GUIDES TO PRACTICE

In our journey bringing this collection to publication, we found ourselves reflecting on the impacts of the research and ideas that our authors raised. To further extend our metaphors of journeying and mapping that have pervaded this collection, we decided to aid readers in navigating implications for practice by adding an addendum to chapters that might help in presenting modes of practice relevant to the theory and case studies. Inspired by the use of wayfinding as a curricular metaphor (Beudert & McClure, 2015), we asked authors from sections one to three to provide a framework for their chapter that would include a synopsis, some essential questions, and a range of resources around prominent themes. These wayfinders help to contextualize the collection through media arts education sites, and offer readers additional resources that may impact their own practice in global media arts education.

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PART I

Activism in Global Media Arts:
Political Mediascapes and Speaking
Back to Power



Media Arts as Political Advocacy in Hong Kong's Social Movements

Lee Cheng

The rapid advancement of the internet and communication technologies has made the creation and sharing of media artifacts affordable and widely accessible, leading to a culture of sharing knowledge, information, and ideas that is characterized by ubiquity, rapidity, and responsiveness. Social media and instant messaging platforms have transformed the way people communicate, revolutionizing social rules for and patterns of expression. In the twenty-first-century political ecosystem, social media are used to disseminate propaganda, which includes the unethical use of technology to achieve political goals by fair means or foul (Woolley & Howard, 2018). Media arts, which include all forms of creative practice and make use of electronic equipment, computation, and new communication technologies for artmaking purposes (Peppler, 2010), have become an indispensable part of our daily life in this digital era.

Hong Kong has been plagued by political instability over the last decade, with large-scale disputes between citizens and the authorities,

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namely the Moral and National Education controversy in 2012 (Morris & Vickers, 2015), the Umbrella Movement of 2014 (Fung & Su, 2016), and the Anti-Extradition Law Amendment Bill (Anti-ELAB) movement from 2019 to 2020 (Lee, 2020b). While the control and influence of the Central People's Government has become progressively more explicit in the state-run news media, media arts have also become more prominent on social media and instant messaging platforms. In the recent Anti-ELAB protests, media arts have not only been used to generate publicity, but have also provided a means for global political advocacy and the co-creation of symbolic artifacts. Taking the Anti-ELAB movement as an example, this chapter explores the use of media arts for political advocacy and propaganda to promote fundamental human rights and universal values. It also explores potential formal and informal pathways for media arts education for political advocacy.

THE ANTI-EXTRADITION LAW AMENDMENT BILL MOVEMENT

The Anti-ELAB movement has been the largest civil disobedience campaign in the history of Hong Kong, surpassing the Umbrella Movement of 2014 (Lee, Tang, et al., 2020). This series of protests was triggered by the proposal of a bill to amend the Fugitive Offenders Ordinance by the Hong Kong government, which would allow extradition to any jurisdiction regardless of whether a prior agreement had been reached. Lacking trust in the government, especially regarding Chinese affairs, citizens considered the bill a back door to the implementation of the Chinese legal system in Hong Kong, which would undermine the city's autonomy and infringe on its civil liberties. Having learned lessons from the failings of earlier movements, citizens swiftly developed a protest from a single event into a large-scale social movement and exhibited a high degree of solidarity, determining the course of collective action by consensus. One of the main characteristics of this movement is the organically arising synergy of multiple approaches taken by participants from diverse political backgrounds—an unanticipated step in the evolution of protest movements in contemporary civil society (Chung, 2020).

The Anti-ELAB protests have benefited from the sophisticated use of technology and media for communication and propaganda. While the Umbrella Movement highlighted the disadvantages of centralized

leadership, the anonymity provided by instant messaging platforms has played an important role in the decentralized and coordinated activities of protesters in the Anti-ELAB movement (Wong, 2020). This has included masking personal identities from surveillance, protecting key opinion leaders from being recognized, communicating onsite tactics and deliberating over long-term strategies, and mobilizing protesters through crowdsourcing information. Social media have served as tools to spread information and maintain the momentum of ongoing protests, and media arts have been used to support the social movement in entirely new ways.

MEDIA ARTS AND POLITICAL ADVOCACY

Alongside their ever-developing communication function, from the radio in the 1920s to television in the 1950s and the internet from the 1980s, media have long been used for political advocacy. Digital media have opened up new possibilities and affordances for empowering and shaping social movements in the internet age (Castells, 2015). Going beyond their primary function as tools for communication and promotion, digital media have become a means to inform and persuade citizens (Chaffee, 1993). Landmark examples of this use of digital media include the organization of demonstrations in the United States against the Iraq War (Bennett et al., 2008), as well as the building of extensive networks and creation of social capital in the Arab Spring (Howard & Hussain, 2013).

The emergent field of media arts, which can be referred to as digital arts or new media in a broad sense (Peppler, 2010), has brought a new dimension to protest ecologies, which formerly relied on materialized and tangible confrontations. It has made possible the social production of virtual spaces in which activists develop and share tactics (Ku, 2012), facilitating the creation of autonomous networks capable of sustaining movements in the absence of centralized leadership. The Umbrella Movement displayed some of the advantages of new media practices, including the mobilization and organization of protest activities, but it also revealed the downsides of the adoption of digital organization methods (Agur & Frisch, 2019). These include the dissemination of conflicting messages through social media, vulnerability to disinformation campaigns and suspected “fake news” disseminated by opposing parties, and age segmentation, which leaves digital immigrants—late adopters of digital technologies—out in the cold.

MEDIA ARTS IN THE ANTI-EXTRADITION LAW AMENDMENT BILL MOVEMENT

Having learned painful lessons from the Umbrella Movement, participants in the Anti-ELAB movement have made sophisticated use of technology and media to facilitate political advocacy in Hong Kong without centralized leadership (Lee, Yuen, et al., 2019). Characterized as a “leaderless” movement (Lee, Yuen, et al., 2019, p. 14), the recent protests have used highly fluid tactics of civil disobedience and self-mobilization. In addition to attracting domestic attention and creating a digital space for activism, digital media have been used to raise international awareness of democratic movements. Participants have used online forums and instant messaging platforms to evaluate the validity of news through collective information sharing, offsetting the influence of disinformation campaigns and suspected fake news disseminated by opposing parties. Symbolic artifacts co-created by members of the movement have been used to voice support for the cause, highlighting the role of media arts in the formation of social consciousness and networks. These ecological and community practices also provide a new perspective to the affordance of media arts for its emerging role in citizenship education through informal learning. The following subsections will review some of the key examples.

Movement Anthem: “Glory to Hong Kong”

With technological development, media arts have become a viable way for moderate protesters and netizens to participate in social movements. The co-created song “Glory to Hong Kong,” widely regarded as the anthem of the Anti-ELAB movement, is a useful example of how collective action can be taken using digital technology (Chang, 2020). Unlike other protest songs of the time, this anthem was co-created by netizens through discussion in an anonymous online forum (Yiu, 2020). The original composers and lyricists are known only by their pseudonyms in this forum, and a demo of the song was posted in the forum for commentary, discussion, and modification. With the contributions of netizens, the initially protest-oriented lyrical content evolved to encompass the topics of fundamental human rights and universal values such as freedom, equality, and justice (Hong Kong Apostasy, 2019). Soon after netizens reached a consensus on the final version, an orchestral and choral arrangement of the movement’s anthem was recorded by a group of artists who named themselves Black

Blorchestra (White, 2021). The co-creation of “Glory to Hong Kong” using social media and instant messaging platforms demonstrates not only the potential of media arts to serve as an outlet for political advocacy, but also their commonality with protest art, in that they provide affordable and accessible methods for activists to support social movements.

Other than functioning as a symbol of unity for the protesters, the movement anthem also shares the educational purpose of national anthems, acting as a vehicle for cultivating political and civic values (Ho, 1999). While the enactment of the National Anthem Law has been seen as one of the security measures to impose patriotic education into the school curriculum (Cheng, 2020), “Glory to Hong Kong” could be regarded as counter-propaganda to promote freedom and democracy, which are being suppressed in Hong Kong society.

Video-Game Activism

Rebellion against and resistance to hegemony and authoritarianism have always been popular subjects of video games, creating opportunities for storytelling and challenges for players to overcome. During the Anti-ELAB movement, video-game artists used digital game technology to promote social or political change (Davies, 2020). A team of developers produced a computer game titled *Liberate Hong Kong* that was explicitly inspired by the city’s ongoing social movement. The game takes place in a world that recreates the visual imagery of the protest movement, including neon signs with traditional Chinese characters, protesters dressed in black bloc attire with yellow construction helmets, roadblocks, and tear gas. In the character of a protester, players complete tasks such as collecting and throwing tear gas canisters while avoiding being shot or arrested by the police. This gameplay closely resembles the Anti-ELAB protests. Another crowdsourced game, *Man without Organs* (Navi, 2022), takes a narrative approach, allowing the players to recover the memory of a deceased person who is seeking to retrieve and restore the preapocalyptic history of Hong Kong, to eventually get to the bottom of why the city has been destroyed.

Liberate Hong Kong, *Man without Organs*, and similar games are not simply intended to be a source of entertainment. Neither are they primarily intended to archive the social movement or the “disappearing space” of Hong Kong, as theorized by comparative literature scholar Ackbar Abbas (1997, p. 9). As well as attempting to attract international attention to the

movement, this type of video-game activism could also be understood as the emergence of Hong Kong in virtual space in parallel with its disappearance in actual space (Davies, 2020). With virtual social interaction becoming as relevant as real-world interaction, political activism in digital spaces could provide an effective means to advocate for human rights and universal values, as well as a feasible way to mobilize communities to take political action. Delivery of information and messages through video-game design also makes available both intrinsic and extrinsic motivators for players to learn through the gamification process (Kapp, 2012), as exemplified in this case, where the protest tactics and situation of Hong Kong protesters during the Anti-ELAB movement could be immersively promoted to wider audiences through gaming.

Art Invasion of Public Spaces

Activist art has often been used to challenge preconceptions about the role of arts and culture in society by promoting social action. In the Anti-ELAB movement, the creation of visual artifacts in public space has become a common form of art invasion, used innovatively in both digital and physical spaces. A typical example of activist art in public space is the co-creation of Lennon Walls in Hong Kong, a practice expanded from the Umbrella Movement (Lin, 2016). Inspired by the original monument in Prague, representing ideals such as love and peace, Hong Kong's Lennon Walls were made from sticky notes contributed by individuals expressing their concerns and hope for freedom and democracy. The first wall was built in October 2014 at the Central Government Complex, which was the focal point of Occupy activities during the Umbrella Movement. The colorful mosaic has attracted international attention on social media, coming to symbolize the collective, spontaneous, and free expression of Hong Kong citizens.

During the Anti-ELAB protests in 2019, Lennon Walls spread across the city and beyond. This practice not only echoed the occupation of urban public spaces in the Umbrella Movement, but also enabled citizens to voice their dissent within and beyond their own communities. In 2019, more than 150 Lennon Walls emerged across the city, including in restaurants and shops supporting the social and political movement; in pedestrian tunnels; on bridges; and in public facilities and government buildings. Lennon Walls in support of Hong Kongers have also appeared in cities across the world such as Taipei, New York City, Vancouver, and London.

Considered a threat to the governing authority, however, most of Hong Kong's Lennon Walls have been vandalized and destroyed by pro-establishment party supporters claiming to be ordinary citizens but acting under police protection (Lo et al., 2021).

The evolution of Lennon Walls in the Anti-ELAB movement represented not only an alternative form of media in public space, but also a form of "embodied media" that allowed interpersonal communication within broader communities beyond the context of the social movement (Juris, 2012). Those embodied media enhanced the communicative affordance of public space and encouraged citizens to communicate, and their anonymity strengthened participants' empathy and sense of togetherness by enabling them to express themselves freely. Through active participation in collaborative placemaking, young people develop a sense of agency and purpose in community life (Duff, 2010; Ehret & Hollett, 2016), and they also become more informed about and engaged in the process of participatory democracy (Schugurensky, 2006). These informal learning environments highlight the potential of media arts for civic education in contemporary society.

Apart from co-created media artifacts, professionally produced publicity materials and infographics have been shared in public spaces such as Lennon Walls, as well as on social media and instant messaging platforms (Kow et al., 2020). Printed slogans such as "Five demands, not one less" and "Liberate Hong Kong, the revolution of our times" have become ubiquitous in urban spaces, and images of the protest have spread rapidly via online forums, social media, and instant messaging groups. Hong Kong commuters on subways and other public transportation have received protest-related materials via Apple AirDrop and Bluetooth, shared by participants in the social movement in the same area (Davies, 2020). Unlike marches and rallies organized by traditional political parties, the Anti-ELAB movement has not made use of printed posters and flyers, as its initiatives have been organized spontaneously by netizens. This has resulted in one of the most distinctive aspects of the movement: its diverse and rich visual imagery (Ismangil & Lee, 2020).

Internet memes created by netizens with little skill in graphic design have rapidly propagated as stickers on various instant messaging platforms, typically derived from cartoon characters and iconic figures. Pepe the Frog has become the most popular political meme in the Anti-ELAB movement (Vukovich, 2020). Originally a white supremacist hate symbol, Pepe the Frog was adopted by this social movement in the opposite capacity,

symbolizing the desire to fight for human rights and universal values. While the contrasting use of Pepe the Frog has been unintentional in the context of Hong Kong social movements, perhaps the best explanation for this phenomenon is the unpredictability of social media (Margetts et al., 2015).

Mobile Apps and Real-Time Updates

In the Anti-ELAB movement, mobile technology has been used in sophisticated ways to create autonomous communication networks supported by wireless communication and the internet. Interactive maps such as annotated Google Maps and HKmap.live have been used to indicate the locations of police, protest participants, nonparticipating residents, supplies, surveillance cameras, tear gas, first aid stations, and roadblocks (Jackson, 2020; Kow et al., 2020). These applications allow users to generate updates and fact-check the information uploaded by other users (Fig. 2.1). The implementation of digital democracy within these interactive maps reflects the open and collaborative networking characteristics of digital media, revealing the potential for media arts to facilitate more participatory democracy and to challenge the traditional interests of communicative power (Loader & Mercea, 2011).

Livestreaming services have also been used as major platforms for real-time updates (Ting, 2020). As online streaming media have become more



Fig. 2.1 Web interface of HKmap.live

affordable and accessible in the new millennium, many media outlets have begun to provide livestreaming services to report news and events in real time. The Anti-ELAB movement has seen the widespread use of livestreaming to broadcast protest events by television stations, newspapers, online media, student media, independent reporters, legislative councilors, and individual citizens. Millions of Hong Kong citizens and international audiences have watched protest events unfold in real time, including some of the most shocking incidents (Lee, 2020b).

The sharing of text-based information among protesters and moderate supporters of the social movement has mainly occurred on instant messaging platforms and in online forums. In the absence of centralized leadership, many initiatives, such as large-scale strikes and multidistrict marches, have been organized by consensus among netizens in LIHKG Forum, a popular Reddit-like online forum in Hong Kong. Besides text-based discussions to reach a consensus among the crowd, the voting function within the forum has helped participants to determine the trustworthiness of information or decide whether a proposed action should be taken (Kow et al., 2020). On-site protests have mainly been coordinated and mobilized through instant messaging platforms. Telegram has typically been preferred over WhatsApp and other platforms owing to its anonymous communication service and the widespread belief that it provides better encryption. Other features, such as its voting function and channels with unlimited membership, have also contributed to its affordance as a form of broadcasting.

Disinformation Campaigns and Fake News

Taking advantage of the opportunities that the internet presents for collaboration, communication, and peer production, disinformation campaigns have been used as a propaganda tool, targeting vulnerabilities in the news media ecosystem to increase the visibility of their messages and their audience (Marwick & Lewis, 2017). During the 2016 US presidential election, concerted efforts were made on Twitter to promote a particular political ideology by manipulating the existing media infrastructure. Similarly, the Umbrella Movement saw the spread of state-sponsored disinformation (Wong, 2020). Learning from the failings of previous movements, the fact-checking of information shared via online forums and instant messaging platforms has become standard practice during the Anti-ELAB movement. Media platforms have also attempted to stop

disinformation campaigns by suspending and closing accounts that deliberately attempt to sow political discord, including those undermining the legitimacy and political positions of the protest movement (Nikiforos et al., 2020).

Fake news can be created very easily by almost anyone using low-tech mobile apps and social media accounts. With the rise of anonymous instant messaging and social media platforms, anyone can communicate and share ideas without disclosing their true identity. As a result, disinformation campaigns have become a powerful weapon used across the political spectrum. During the Hong Kong Umbrella Movement and Anti-ELAB movement, news has been manipulated and fake news has been created by both the pro-establishment and pro-democracy camps and individual supporters (Lee, 2020a). However unethical, disinformation campaigns and fake news have proven to be effective tools for spreading libel and casting doubt on the accuracy of real news, despite efforts to identify them and prevent their spread (Keller et al., 2020).

Documentation and Archiving of Media Artifacts

Although the protests have been cooling down, perhaps owing to the COVID-19 pandemic outbreak in 2020, an effort has been made to document and archive the media artifacts created by netizens before they vanish. Mobile platforms such as Mention La have been developed, making it possible for netizens to upload and share their graphical creations for the Anti-ELAB movement (Choi, 2020). These platforms are equipped with sophisticated content management systems that make the categorization and retrieval of artifacts and related information easily accessible to anyone.

Other approaches include the archiving research initiated by local media artist Eric Siu and curator Joel Kwong, titled “Be Water by Hong Kongers,” which showcases the digital excellence of Hong Kongers during the political movement since 2019 (Tondello, 2021). This project collected examples of digital excellence from within the protest and generalized them into the discourse of the digital community. It was awarded the Golden Nica in the Digital Communities category at the 2020 Prix Ars Electronica (Gegenhuber et al., 2020), which brought the anonymous co-creation of Hong Kongers into the international spotlight.

MEDIA ARTS EDUCATION FOR POLITICAL ADVOCACY

With its global reach and impact, the Anti-ELAB movement represents a watershed moment in Hong Kong's history of social movements (Ku, 2020). It has received worldwide support in the form of media campaigns, demonstrations of solidarity, and nongovernmental public diplomacy. With its novel use of media arts, the movement has pioneered tactics and strategies for successful activism, using advanced internet and communications technologies to support spontaneous, decentralized organization and the dissemination of information. The innovative use of media arts has helped participants not only to overcome the obstacles posed by digital surveillance, indiscriminate arrests, and police crackdowns, but also to reach international audiences to build public awareness of their cause (Rawdon & Moxley, 2016). The Anti-ELAB movement is deeply concerned with the politics of place and, through the innovative use of media arts, has transformed existing physical and virtual spaces into places of political action. The use of art activism presents a new model for protests around the world and demonstrates that media arts are capable of providing informal education by facilitating the sharing of information and advocating for human rights and universal values. Through knowledge exchange and discussing ideas in the virtual medium, participants could also develop communication, critical thinking, and analytical skills in a self-directed manner. As these general competencies are becoming more important in coping with future challenges in the digital era (Trilling & Fadel, 2009), engagement in digital and social media could be a feasible way for young people to cultivate such knowledge and skills.

Given that the Anti-ELAB movement has been seen as an exemplary case for its lack of centralized leadership, ethical issues surrounding disinformation campaigns within the movement have become a source of controversy. Fake news has proven effective in achieving political goals by manipulating audiences' emotions and tapping into deeply held partisan beliefs (Gelfert, 2018). While there is growing interest in researching technology for the detection of fake news (Shu et al., 2017), an educational and regulatory plan to increase media literacy and improve the ethical standards of practitioners and citizens is necessary to ensure that these issues are resolved. Ethical standards must be upheld by media outlets to ensure that the information they release is accurate, especially given the near-immediacy with which news is disseminated in the digital era. This could be facilitated by the gatekeeping roles of social media and instant

messaging platforms, as well as governmental efforts to regulate and monitor the media sector. However, if disinformation campaigns are initiated or deliberately indulged by the government (Bennett & Livingston, 2018; Lo, 2021), international intervention may be required.

While the advancement of information and communication technologies has enabled everyone to create and share media artifacts in which information is embedded, a top-down approach to governing traditional and new media cannot adequately defend against fake news and disinformation campaigns. Formal education could be a viable means of developing citizens' media literacy, critical thinking skills, and understanding of the ethical issues surrounding the use of media. This may involve an interdisciplinary and multimodal approach to cultivating digital literacy from a young age (Tablib, 2018). Instead of a conventional instructivist way of teaching in formal schooling, teachers and educators could reference the aforementioned ecological practices to synergize students' motivation in the learning process. These include contemporary pedagogical approaches such as experiential and blended learning (Pereira et al., 2019), which could involve students reflecting critically on their interaction among peers within virtual media as guided by teachers. At primary and secondary school levels, students could be taught about intellectual property, copyright, and the potential consequences of creating and disseminating untruthful content. These considerations could be embedded in a curriculum for general studies that explores the relationships among self, media, and society. At the higher education level, universities and other institutions could enhance the development of students' critical thinking skills within the general education curriculum. Modules for digital literacy could be included for students to learn about the social impact of art and media and the ethical considerations involved in creating online media; that is, what should and should not be created, in light of human rights and universal values. A multimodal educational approach such as this may prove vital to ensuring society's sustainable use of media and technology in the future.

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Back to the People: Transforming the Role of Media Arts in the Context of the Chilean Social Uprising of October 2019

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The Chilean *Estallido Social* (Social Uprising)¹ that began in October 2019 altered politics, social relations, and life in general in Chile at multiple levels (Durán, 2020). Of course, the realms of culture and the arts were not exceptions, as this social mobilization also impacted artistic practices across all media. In this chapter, we will look at how the role of media arts and the practices of media artists in Chile shifted following the Social Uprising. We will first provide a brief contextualization of the Social Uprising and then review how media arts changed after October 2019 in terms of physically and digitally opening access to wider audiences,

¹ See Dobraszczyk (2021) for photos documenting the uprising.

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making social critique more recurrent and explicit, including more direct references to popular culture, and simplifying content with political goals. These changes will be understood in comparison to the preexisting landscape of common media arts practices and topics that developed during and after the 1973–1989 dictatorship. In addition, we will provide specific cases to illustrate these transformations and their relation to the 2019 mass mobilization process. We will analyze how these changes echo artistic, pedagogical, and activist practices found in public pedagogy and activism. In the final section, we will offer suggestions for how the newly emerging field of art education in the country may contribute to social transformations by facilitating students' engagement with media arts from a public pedagogy and activist perspective.

We understand activism as a recovery of artistic action aiming to produce social interventions. It is a practice that unfolds within public spaces usually intended to hold no artistic or communicative expressions, such as bus stops or building facades, in order to ignite dialogue and foster social transformations (Aladro-Vico et al., 2018). This hybrid form of artmaking and activism is usually characterized by the formal simplicity and ephemeral nature of its art production, taking advantage of art's power to adapt to a society overloaded by information and images in order to generate and effectively convey messages in quick and simple ways (Pacheco-Pailahual et al., 2019). Eva Aladro-Vico et al. (2018) also suggest that activism is different from political art because it is situated, and therefore tends to formally and conceptually include its context, along with all the dwellers and signifiers inhabiting it. In this sense, activism also enables practices that help to better understand and resignify human and social experiences (Carrasco-Polaino et al., 2018). In terms of content, activist practices utilize arts' ability to facilitate critical consciousness-raising (Rhoades, 2012), and its pedagogical capacity for generating cultural and social transformations (Aladro-Vico et al., 2018; Carrasco-Polaino et al., 2018). Finally, artists' work always seeks to expose and overcome systems of oppression through artmaking, and to reclaim public spaces as sites for citizens' political reflections to unfold (Aladro-Vico et al., 2018).

Conversely, we understand public pedagogy as a practice that responds to critical pedagogue Henry Giroux's (2004) call for intellectuals to

orient their teaching for social change, connect learning to public life, link knowledge to the operations of power, and allow issues of human rights ... to occupy a space of critical and open discussion in the classroom. It also

means stepping out of the classroom and working with others to create public spaces where it becomes possible ... to link one's critical imagination with the possibility of activism in the public sphere. (p. 77)

Resonating with this call, we also understand public pedagogy as a practice that actively seeks to transform society (Desai & Darts, 2016; Giroux, 2003, 2004), critically analyzes hegemonic discourses displayed in public spaces, takes into consideration the pedagogical nature of grassroots organizations and their resistance efforts (Sandlin et al., 2010), and has a strong affinity with artistic practices, as explored by Lisa Hochtritt et al. (2017) and Dipti Desai and David Darts (2016), among others. However, it is important to mention that, although public pedagogy endeavors may utilize artistic practices, this is not always the case for such initiatives. For this reason, we complement public pedagogy with the concept of activism in this chapter, as the latter more directly involves ideas on the individual and the collective nature of artistic practice in relation to social change (Aladro-Vico et al., 2018). We argue that public pedagogy and activism can help to shed light on the nature of the media arts interventions that took place after the Social Uprising in Chile.

THE SOCIAL UPRISING

In order to better understand how the Social Uprising of October 2019 altered the media arts landscape in Chile, it is important to explore this mass mobilization process. The Social Uprising was the result of major social inequalities that had increased during the 1973–1989 military dictatorship and were perpetuated by the different democratic governing coalitions that followed it since 1990. Among the many causes of social inequalities, we can find miserable pensions, low-quality education, a collapsing healthcare system, and the absence of welfare assistance (Jiménez-Yañez, 2020; Manríquez & Polomer, 2020). Such inequalities, along with multiple unveiled corruption scandals, led to the social explosion seen on October 18, 2019, which was triggered by high school students protesting a 4 percent increase in subway fares. That day, the government shut down Santiago's subway system in response to increasingly intense student protests in some stations, collapsing the entire public transport system. The streets throughout the capital were filled with people walking from their jobs to their homes, and discontent turned into rage, and then rage into violence. Barricades and protests arose in practically every city in

Chile. Several subway and bus stations were burned, drugstores and supermarkets were looted, and public institution buildings and banks were damaged.

President Sebastián Piñera's government responded to this by applying severe police repression and subsequently declaring a state of emergency, imposing a curfew, and allowing the military to take command of the streets. Despite these measures and the many cases of state violence that were registered (Human Rights Watch, 2019), the protests continued throughout the rest of the year, a key day being October 25, 2019, when about 1.2 million Chileans marched in the capital, in Chile's largest demonstration since the return to democracy. Finally, members of the government and political parties on the right and left agreed to hold a referendum² to decide whether or not citizens were in favor of writing a new Constitution. However, the protests continued, and the idea of a "second uprising" for March 2020 was gaining momentum on social media, only to be disrupted by the COVID-19 pandemic.

CHILEAN MEDIA ARTS AFTER THE SOCIAL UPRISING THROUGH THE LENSES OF ARTIVISM AND PUBLIC PEDAGOGY

In this section, we will explore different axes around which media arts practices changed after the Social Uprising of 2019, although some of these changes had already been developing, both in terms of content and public access to media arts pieces (Montero Peña, 2015). In this sense, it is important to consider some of the characteristics of media arts in Chile during the first decade after the return to democracy in 1989. María Valentina Montero Peña's (2015) study found the following:

During this period, Chilean media artists and collectives often conceptually addressed the very media they worked in through intertextual reflections, and they had only begun to introduce existing signs from mass culture in order to subvert stereotypes and address identity issues. Some of them also tended to address the sociopolitical and economic consequences of the imposition of the neoliberal model in the country, presenting reflections about the complex social processes and transformations taking place in Chile due to this imposition. (p. 18)³

²This referendum took place in October 2020, and about 79 percent of Chile chose to change the 1980 Constitution.

³All translations from Spanish in this chapter are our own.

This tendency to include critiques of the country's social, political, and economic structures gained strength through events such as the Chilean Biennial of Media Arts, which has tended to keep in touch with the political pulse of the country. As for the spheres and institutions within which media arts unfolded before 2019, Montero Peña (2015) suggests that, during the dictatorship, this kind of artistic practice and its teaching and study took place mostly outside of formal institutions, such as museums or academia. When democracy was recovered, the newly created academic and cultural institutions of democratic governments invited artists to abandon the margins in which they had previously acted. It was not until the mid-2000s that media artists slowly began to reconnect their practice to the social events taking place in the very margins they had once inhabited, and to open their works to wider audiences, mainly through online venues. This process of reconnection was still timidly evolving by 2019, but the events of October quickly pushed this evolution much further.

In order to analyze how Chilean media arts changed after the Social Uprising, we will review a series of media arts pieces that were created during or after the events of October 2019. We will analyze how the changes these cases brought to the Chilean media arts landscape can be understood as part of a trajectory that integrates activist and public pedagogy practices and strategies in order to contribute to social transformations (Aladro-Vico et al., 2018; Giroux, 2004; Sandlin et al., 2010).

We argue that all the pieces reviewed here can be read as acts of public pedagogy seeking to transform society (Desai & Darts, 2016; Giroux, 2003, 2004). We also discuss these pieces as vehicles to publicly spread information and reflections to wider audiences on topics as important as inequality, oppression, state violence, memory, and ideas on how to improve our democracy, especially in relation to the rights that should be enshrined by the new Constitution. Such public pedagogy endeavors are crucial if Chilean society wants to include the multiple and diverse voices at its grassroots in deliberations about the country we want for the future. Finally, we also argue that all the media arts interventions presented in this chapter echo the transformative aims and formal strategies of activist practice, such as the straightforwardness of messages and their ephemeral nature (Aladro-Vico et al., 2018; Pacheco-Pailahual et al., 2019). In the following sections, we will further illustrate how the media arts pieces produced in Chile during the Social Uprising intersect with both public pedagogy and activism.

Although Chilean media artists had already been increasingly implementing strategies to discursively intervene in physical public spaces since 2003 (Montero Peña, 2015), most of these public interventions were still taking place online in 2019. However, inspired by the masses of people that flooded the streets of Chile, media artists also felt the urge to bring their political actions into the public spaces protesters were struggling to occupy. This way, they could contribute to the expansion of the ideas, stories, and memories that fueled the social movement. These interventions also countered official and mainstream narratives criminalizing the protest and denying violence by the state (Flores Herrera & González Pozo, 2020; Gaspar & Jarpa, 2020; Manzi Zamudio, 2020). In this sense, media artists and the reflections they rendered visible served as a bridge connecting an already prominent online activism with the activism taking place in the streets, thus reinforcing the latter, as Laura Baigorri (2003) and Habibul Haque Khondker (2011) suggest. Through their projections and digital interventions, Chilean media artists became a political aid to the social movement, turning Chile's cities into screens to communicate and share their views, and expanding the ways in which the people could occupy public space in the pursuit of their political goals (Kekou, 2019; Manzi Zamudio, 2020).

One example of these media arts interventions in public space was the hacking of the information screens of an iconic shopping mall in Santiago (Costanera Center), replacing the usual information with a photo montage of President Piñera and a group of protesters carrying a sign that read “Huele a dictadura” (It smells like a dictatorship). These unknown artists subverted an emblem of the Chilean elite's neoliberal ideology⁴ and placed the term “dictadura” (dictatorship), which still marks and divides this elite, in the center of where they reside in Santiago, for every shopping mall visitor to see. In this sense, they embraced some of the strategies of the hacker culture, such as contesting authority and top-down forms of

⁴The economic and political forces that seized power after the 1973 state coup established a system that privatized most public services and state-owned industries, placed focus on the public spending strategy in order to shrink the state, and opened the country to aggressive foreign investment. These and other radical transformations placed economic growth and material success as the country's new driving forces. Since Chile did grow (although very unequally), this system has been praised as even miraculous by the Chilean economic elite and certain economists. See Taylor (2003) for more details on the neoliberal policies established in Chile during and after the dictatorship.

organization, and opening access to information, culture, and ideas (Niaros et al., 2017).

Considering that upper-class areas contain no memorials commemorating any of the events/victims of the dictatorship (unlike the rest of the city), the usage of “dictadura” in this particular elite neighborhood is not to be overlooked. It counters what Carolina Aguilera (2015) refers to as “politics of memory that are territorially discontinuous and that encourage forgetting in residential settings of the country’s elite” (p. 102). This intervention exemplifies how Chilean media artists used the potential of activism to occupy and make use of physical public spaces to publicly shine light on issues of inequality and social injustice (Aladro-Vico et al., 2018).

Another example of public media arts interventions using the aforementioned potential of the media arts to occupy public spaces are the works of the Delight Lab collective. This group projected different text-based light interventions on significant urban landmarks during the Social Uprising (Manzi Zamudio, 2020). Their interventions, especially in the epicenter of the protests, highlighted key ideas or events associated with the country’s political and social movement, in particular to denounce human rights violations by the police and generate empathy for the victims. Although there have been multiple interventions by this collective, perhaps the most emblematic would be the projection of the word “Dignidad” (Dignity) on the Telefonica Tower. This building is the portrayal that the Chilean elite installed at the heart of the city, right next to the epicenter of demonstrations, to highlight the “success” of the Chilean neoliberal experiment (Gaspar & Jarpa, 2020). The work of Delight Lab has been so prominent after October 18, 2019, that their members have become victims of harassment, threats, and hacking (López & Contreras, 2020), and some of their projections have even been censored by the authorities (Villarroel, 2020).

The work of Delight Lab exemplifies the ways in which a plethora of art forms covered the streets and buildings of Santiago and other cities during the social mobilization of 2019, publicly questioning social problems, resisting the processes through which the interests of capital and state produce urban spaces, and suggesting more democratic options to the dominant structures and structural practices (Pinder, 2008, as cited in Desai & Darts, 2016, p. 189). Besides transforming the works into effective public pedagogy devices, the large scale of Delight Lab’s interventions served to politically tie public spaces and their dwellers. In this regard, according to Fernando Gaspar and Guillermo Jarpa (2020), these

projections were fed by the diverse verbal expressions and general leitmotifs that emerged during the protest, both in the physical rallies and the online public venues, such as “No estamos en guerra” (We are not at war), “Chile despertó” (Chile woke up), or “Dignidad” (Dignity). Echoing activist strategies, Delight Lab’s projections are characterized by the straightforwardness of their messages and the formal simplicity with which these discourses and ideas were delivered (Pacheco-Pailahual et al., 2019), which were keys to their success.

Another case worth analyzing is the work of the collective *Antes del Olvido* (literally, “Before Oblivion”; <http://antesdelolvido.cl/>), in which participants are encouraged to connect physical public spaces with 3D modeling practices in order to generate new understandings of both the Social Uprising and its effects on Chile’s urban fabric (Dejtiar, 2019). For this, the collective generated tutorials and imparted different workshops on basic photogrammetry, 3D modeling, and animation techniques and tools, inviting participants to scout the city and scan different objects in public spaces that show how and where the social movement marked the city. Photogrammetry generates 3D models with photographic information, so most of these objects show how graphic art and graffiti were extensively used on public places during the mobilization to highlight issues of inequity and state violence. These models are then shared by participants on an interactive map, thus generating an archive of 3D models depicting multiple popular interventions in public spaces (see Fig. 3.1). Such engagement with public spaces resonates with Aladro-Vico et al.’s (2018) description of how activism helps by collectively rediscovering public space and recovering the artistic voices displayed in it. The strategies used by this collective resemble the activist strategy of relying on the potential of online activism and the internet as a site for social justice and cultural transformation (Baigorri, 2003; Pacheco-Pailahual et al., 2019). With this project, *Antes del Olvido* opened up a space for the unique kinds of interactivity that media arts practices offer to subvert existing understandings of public space (Zhang & Su, 2018). In this sense, the project updates the.

economic and imaginative struggles for public spaces [which] have given form to the artistic practices that interact with the street, the park, and the virtual space in the American continent, [practices that], in turn, have shaped these struggles. Artistic practices continue to thrive as a tool to reinvent the social and rethink public space in our interconnected contemporary audience. (Raussert, 2020, p. 232)



Fig. 3.1 3D model of an activist intervention at a monument in Santiago, by Felipe Baeza (2019). (Reproduced with permission)

Such (re)signifying practices can be found in the hybrid mapping-archiving-designing interactions offered to the participants of the *Antes del Olvido* project.

Finally, another example of media artists interacting with the social movement is the work of multiple film and audiovisual collectives, such as Mafí, Imagen de Chile, Registro Callejero, and OjoChile (Fajardo, 2019; González, 2019). Using the potential of social media as a public site for transformative endeavors (Baigorri, 2003; Pacheco-Pailahual et al., 2019), these groups generated multiple video pieces that used arts' ability to facilitate critical consciousness-raising (Rhoades, 2012) in order to achieve their political goals. The videos focused on compiling police abuse cases to counter official narratives denying such cases, celebrating rallies, marches, or other protest activities, and providing information about the Social Uprising itself: its causes, the demands, the authorities' responses, and other political ideas associated with the process. Besides this media production, these collectives were also compiling and collecting publicly available footage for both remixing and archiving purposes, and for individual users to remix/edit their own pro-mobilization videos to share online. In terms of archiving, some of these collectives quickly generated

public online drives for people to upload images of police and military violence before they were taken down from social media due to violent content. Some of them, like Imagen de Chile, even worked with the Chilean National Institute of Human Rights, using their footage in legal actions against the police and the military (González, 2019).

The video production and archiving efforts by groups such as OjoChile or Imagen de Chile exemplify Di Wang and Sida Liu's (2020) idea that activism has the potential to generate public spectacles with the goal of exposing the illegal or repressive actions of the state, or supporting values and social norms that differ from the official ideology (p. 697). Additionally, audiovisual collectives' storage, dissemination, and protection of state violence footage can be read as an effort to generate what Melanie Buffington and Erin Waldner (2011) call "counter memory." This memory often represents those groups or individuals who were rendered invisible by the collective memory, which, conversely, "can be formed through people's susceptibility to the rhetoric of a dominant group with power to circulate ideas, regardless of historical accuracy" (Buffington & Waldner, 2011, p. 96). Considering how the traditional media outlets and the government often condemned protesters and justified police and military actions (Flores Herrera & González Pozo, 2020), their erasure of the victims' suffering, via the denial of the illegal violence exerted on their bodies, was contested by the dissemination of these counter memories. These forms of activism counteract collective memory, dismissing the human rights violations, like what happened during—and after—Pinochet's dictatorship (Flores Herrera & González Pozo, 2020).

Besides documenting and archiving both the people's mobilization and state violence, these media production collectives also engaged in the creation of videos informing citizens not only about the movement's demands, but also about the upcoming referendum to change the Constitution. They directly involved the people in other media-creation educational activities—OjoChile hosted free film and animation workshops, where attendees had the opportunity to edit using their own materials and footage collected by the collective from both established filmmakers and regular social media users. The objective of these workshops was to produce political reflections on the Social Uprising, the reasons behind it, and the hopes people held for the future in the face of the upcoming changes (Fajardo, 2019).

Through such endeavors, the OjoChile collective, as well as Antes del Olvido, successfully explored the potential of mixing activism and digital

technology to include the community and generate pedagogical tools for political reflection and social transformation. In this sense, these projects pursue the same “proactive strategies to organize and forge community ties and coalitions” (Sandoval & Latorre, 2008, p. 84), as exemplified by Chicana activist Judy Baca’s digital muralism work with youth. A similar emphasis on community empowerment and improvement can be found in other activist projects, such as Liv Gjestvang’s documentary-creation workshops with young LGBTQ communities (Rhoades, 2012). Since both Gjestvang’s and Baca’s activist practice have their roots in the communities they work in/with, their work also intersects with OjoChile’s and Antes del Olvido’s projects in terms of using artistic practice to research communities, learn from them, and learn how to better support them (Rhoades, 2012; Sandoval & Latorre, 2008). The workshops of these collectives make use of “the tools of tactical media activism [that] allow for the pedagogical production of political and social resistance” (Narayanan, 2006, p. 374), a pedagogical production that was also facilitated in the aforementioned projects by the potential of participatory art to serve as a public pedagogical act with great power to rebuild and understand collective spaces of social engagement among community members (Hochtritt et al., 2017). In this sense, both projects entailed the study of public spaces and the sociopolitical disputes taking place in them, from artistic interventions to protests and police abuse cases. This helped the project participants to reflect on how these specific happenings impacted each specific territory/community, as well as the broader issues being discussed in Chile as a result of the social mobilization.

The opening of media arts into more accessible public spaces after the Social Uprising was also accompanied by a conceptual opening. Media artists began to abandon topics and formal choices that rather cryptically addressed the media arts themselves as a language and the political transition to democracy in Chile (Montero Peña, 2015). In this sense, the kind of media arts that creators developed during and after the social mobilization of 2019 contained a far more direct language, often expressed in simpler formal choices, a clearer message that was consistently aligned with the politics of those marching in the streets, and more accessible references ranging from pop and internet culture to recent events and prominent individuals.

Examples of this conceptual openness can easily be found in the video production of film collectives, which is more defined and characterized by the producers’ political objectives than by their artistic goals. Focusing

mainly on human rights violations, the protests, and the political ideas behind the uprising, these media artists conveyed their idea(s) using direct, simple, and concise language along with well-known cultural references (Pacheco-Pailahual et al., 2019). Delight Lab's projections often made a similar use of language, with interventions that consisted of a single word or a sequence of disjointed ones. However, on occasion, this collective would also make reference to contemporary Chilean poets and visual artists such as Raúl Zurita or Alfredo Jaar (Garrido, 2020; Gaspar & Jarpa, 2020), who were not as known to the general audiences as the characters in the videos shared online. Still, the power of the words and the simplicity of the format enabled many people—informed of the references in these projections usually via social media—to connect with Chilean contemporary art, which also raised awareness about the need to expand access to culture and made these references more known to next generations.

SUMMARY OF DISCUSSION AND SUGGESTIONS FOR THE CHILEAN ART EDUCATION FIELD

Despite the scarce research on the history of the development of media arts in Chile (Montero Peña, 2015), we could see how some of the production and dissemination practices that were habitual in this field in Chile changed as a result of the Social Uprising. During our analysis, we observed a marked increase in the integration of activist practices that tied together public physical/virtual spaces, the social majorities dwelling in them, and the political processes enacted by and affecting such majorities. We also found a more consistent use of strategies common to public pedagogy endeavors, such as generating critical analyses of mass culture and media, exploring “popular culture’s critical and counterhegemonic possibilities” (Sandlin et al., 2010, p. 3), using new media to confront official pedagogies within mass media (Giroux, 2004), or disrupting public spaces with educational practices put in motion by citizens focusing on the common good (Hochtritt et al., 2017). Such strategies were used in the projects analyzed here to invite the people to contribute to the reflections the country needs in order to collectively pursue social justice objectives and formulate a more democratic and representative Constitution.

We reviewed multiple media arts projects that exemplify how, after October 2019, Chilean media artists took their work to physical and

virtual public spaces more than ever before, engaged in direct public interactions with their mobilized audiences through artmaking workshops and archiving efforts, increased the inclusion of social and political critiques in their works by always connecting to the social movement's ideas and demands as expressed in the streets, and began making formal choices that made the effective propagation of simple and direct ideas the top priority. We suggest that this approximation between media arts and everyday citizens can be seized by both artists and activists to further solidify their relationships with the public, strengthening the position of media arts within the political landscape, as well as its ability to facilitate social transformations. We also argue that, in order to put its transformative potential into action in Chile, media arts need to continue opening themselves up to the social majorities conceptually and, in terms of access, connecting to them as viewers in broader ways, as well as acknowledging the value of their experiences by including them in its discourses. Such acknowledgment may either be direct, like OjoChile's and Antes del Olvido's workshops, or through the use of references to popular culture, like Delight Lab's projections.

Finally, we argue that the recently emerging field of art education in Chile should take note of how the different processes of social mobilization have affected media arts practices and their very role within Chilean society. By looking at these changes through the lenses of public pedagogy and activism, lessons can be learned about the potential of arts not only to encourage activism and engender political reflections and discussions, but also to aid in transformative social and political processes. In this regard, art educators might help students expand their understandings of their sociocultural contexts and inspire them to take action through facilitating engagements with media arts from a public pedagogy and activist perspective. Additionally, the inclusion of media arts within arts education curricula in Chile may facilitate learners' acquisition of media literacy and critical thinking skills (Peppler, 2010) that, if coupled with a public pedagogy and activist mindset, could in turn help foster individuals' participation in public debates and improve their ability to both decode publicly available messages and produce messages that are clear enough to contribute to making changes happen (Carrasco-Polaino et al., 2018). Since message production is no longer restricted to print, Peppler (2010) argues that engaging with media arts provides a great opportunity to facilitate marginalized groups' development of new literacies and twenty-first-century skills, helping to enable their voices to be heard in today's society.

For this reason, we have focused our analysis on the transformative potential of media arts practices when intertwined with public space and social mobilization processes. We conclude that art educators in Chile may utilize public pedagogy and activist frameworks to engage their students in reflections about the interactions between media arts, public space, and social mobilization, to help them better understand the potential of media arts to aid in social transformations. We firmly believe that studying and nurturing such potential through arts education can make media arts in Chile a great contributor to the much-needed improvement of our democracy.

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Patriotism and Nationalism: Sounds of Dissent and Resistance in Contemporary India

Manisha Sharma

There are eight schools of aesthetics in traditional India developed between the second and eleventh centuries of the Common Era. Key concepts in Sanskrit include *rasa* (essence of an artistic experience), *aucitya* (congruity), *alankara* (rhetoric), *guna* (characteristic quality that evokes aesthetic experience), *riti* (ritual that brings perfection to an artistic experience), *dhvani* (implied meaning felt as a vibration or sound as the aesthetic experience), *vakrothi* (evocation through a particular aesthetic order of expression), and *anumana* (measures and rules of inference) (Gupta, 2017). Traditional schools of Indian aesthetics were mostly concerned with classical arts and folk and popular cultural forms filtered through an organic process of making and consuming art in everyday life. Indian aesthetics is mostly concerned with poetry, music, and architecture, with poetry considered the highest form of literature. Unlike traditional Eurocentric aesthetics, Indian aesthetics are more concerned with expression and

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experience created through all the senses, with no distinct separations between visual and performing arts (Vatsyayan & Chattopadhyaya, 2009). Speaking from personal experience as a student and educator, it seems that in the teaching of Indian art, globally, the Rasa school of art is most popular, at least for visual arts education. For this essay, I focus on the Dhvani school of aesthetics as a way of entering into discussions concerning inter-media arts education.

Intermedia refers to cross-disciplinary and transdisciplinary practices that explore how a concept might be extended and translated into and across varied media and forms of making. The term was introduced by Fluxus artist Dick Higgins and refers to artists whose work seems to “fall between media,” fusing media that fall inside as well as outside established values of the arts. (Elwell, 2006). I choose this school of thought for its relevance to the widespread and impactful poetico-musical engagement by youth in recent Indian civic engagement and the proliferation of artistic political protest culture in the South Asian region.

Dhvani focuses on the relationship between sound and meaning. This concept arose from the demand to explain how the emotional content of a poem or artwork is transmitted to a reader to produce an aesthetic experience in them. Classical philosophers Bhartrihari (fl. fifth century), Ānandavardhana (fl. ninth century), and Abhinavagupta (fl. tenth–eleventh centuries) explained the concept of dhvani in terms of the expression of the artist and *sphota* in terms of the tone or reverberation reaching the ears of the audience (Gupta, 2017). Thus, the potency of what is communicated lies in the relationality of the manifester and the manifested.

Bhartrihari elucidated the relationship between sphota and dhvani, explaining it from the standpoint of the speaker as well as the listener. According to him, a physical, audible sound manifests the sphota, which is the mentally articulated image of the sound through which meaning is conveyed to the listener. Thus, dhvani is the physical body of the word, and sphota is the conceptual entity of sound. In this way, the performance or speaking out loud of poetry is critical to its reception and impact. The term “dhvani” is applied to that which reveals and that which is revealed. It is applied to the process of manifestation, which is the passage of thought from the revealer to the revealed. Ānandavardhana and Abhinavagupta linked dhvani to rasa in terms of a logic of emotion, suggesting that just as meaning can only be suggested and not conveyed directly, so too can emotions only be suggested, as these are both mental qualities and not directly communicable.

In classical Indian art and literature, these concepts are demonstrated through literary forms of songs, fables, and scripture, such as *shlokas*, *sutras*, *shastras*, and *stotras*. These make up early Hindu and Buddhist texts like the Vedas, and epics like the Mahabharata. A shloka in Sanskrit is a poetic form usually consisting of four quarter-verses of eight syllables each or two half-verses of sixteen syllables each, and is the basis for most traditional Indian epics like the Mahabharata. A *stotra* is a devotional hymn and a *mantra* (literally, “crossing over from linear thinking”) with particular rules for its rhythmic and phonic performance—the former a prayer sent outward, the latter a sonic affirmation directed inward for one’s own developing consciousness and awareness.

Dharmic and Abrahamic, Eastern and Western cultural and aesthetic systems are layered in South Asian life. Examples include linguistic hybridities such as Hindi, a language that is a blend of Hindustani (a descendant of Sanskrit) and Urdu (a descendant of Farsi or Persian), and the art of Sufi and Bhakti sects, which focused a search for divinity and divine experience through forms of love and personal emotional experience regardless of religion. These hybridities and cultural migrations resulted in forms such as qawwali, which carries Iranian, Afghan, and pan-Indian musical influences and histories, often blending Punjabi with Urdu and Farsi languages (Plys, 2020).

I experienced the phonaesthetics of the intoned shlokas, stotras, and mantras, as I grew up in India, long before I had ever heard of rap, hip-hop, or spoken-word poetry, which entered the popular culture of India in the 1990s, with globalization and the advent of the internet. I experienced other forms of colloquially popular poetic discourse, such as the *channd* and *chaupai* (quatrains) of Sufi and Bhakti poem-songs, and the *holiyan* and *bolis* of folk music like the percussive and rhythmic beats of *bhangra* and *gidda*, which are performed collectively in social gatherings in Punjabi culture, spanning both India and Pakistan. These are a part of popular culture and learned as informal cultural education.

According to the relational concepts of dhvani and sphota, the content and performance of these poetico-musical forms are concerned with resonance or transcendence in human experience and can live both religious and secular lives, since Indian aesthetics can be broadly divided into two schools: atheist and non-atheist. *Sher* (a couplet, in Urdu) can be grouped together into a poem called *shairi*. These are recited in particular rhythms or set to music as *geet* or *ghazals*, qawwali, and other such structural forms of poetry inherited from the considerable Islamic influence on the poetic

cultures of South Asia. These hybridities illustrate the aesthetics conceptualized in *dhvani* and *sphota*: sensory and emotional aesthetic resonance felt even when the words are in another language, since the tone, technique, and setting of their performance and delivery are as powerful as the words themselves.

This familiarity with the form of spoken-word poetry set to rhythmic music is, perhaps, a reason why the musical styles of hip-hop, rapping, and scatting are welcomed into the popular Indian imagination, even though the specific historical and cultural contexts of these genres may not be fully understood without study. Under the tenets of *dhvani* and *sphota* aesthetics, the underlying feelings of pain, protest, defiance, desire, and aspiration are what resonate with the Indian public, especially in the urban areas of the country where they were made accessible through the internet and other forms of social media.

Contemporary literary production in South Asia continues to reflect multicultural influences, from regionally internal unities to global influences, including those of rap and hip-hop. Recent literary festivals in South Asia have reflected these diverse creative infusions in their inclusion of *shlokas* in rap as “fast poetry” (Shukla, 2016). Musical influences in underground and mainstream culture in South Asia cross borders with gleeful and fearless abandon. They range, experimentally, across sounds of Asia, Africa, the Middle East, the Caribbean, Europe, Latin America, and North America—from reggae to rock, jazz and blues to rap and hip-hop, and salsa to tango—in the sound of musicians in the South Asian diaspora, indie bands at college music festivals across India, the jazz clubs of Mumbai, and the creative fusions in the Coke Studio productions in Pakistan and the Sufi rock bands of Delhi, to the more commercially popular songs of the more than twenty-six film industries across the region. These experimentations demonstrate that East and West can speak with and to each other across boundaries of space and time.

We may understand these fusions as mimetic and hybrid, as glocalizations—not quite world music, not quite “pure” traditional, classical, or folk, but becoming something else in their acceptance, rejection, and renewal of original forms (Sarrazin, 2020). This seeking of artistic forms and content that resonate beyond national-cultural boundaries and adapt into locally relevant cultural art and popular culture offers an opportunity for arts educators to engage students in discourse on interdisciplinary and global civic engagement through the arts. I offer as an example the hybrid

forms of poetico-musical protest culture that have developed in contemporary South Asia.

POETICS AND PROTEST CULTURE: PARTICIPATORY TRADITIONS IN SOUTH ASIA

The Bhakti and Sufi movements, rooted in Hindu and Islamic tenets respectively, began in the eighth century and reached their peak in the fifteenth century. They were led by artists and poet-philosophers who promoted a spiritual connection and devotion, both emotional and intellectual, attainable across social divides. I read these as early anti-establishment arts-based movements. The poets of these movements addressed gatherings in local languages and idioms rather than classical ones, engaging in collective singing, and in call-and-response stylings requiring an understanding of local issues along with deep listening and improvisation skills (Pandey & Tyagi, 2001). In their calls to recognize, own, and take control of their own spiritual and social emancipation, the poetry of Kabir and his ilk made their way into folk and semiclassical music and cracked open elitist social practices that excluded and marginalized large segments of publics. “Latko Chod De Jogiya” (Leave your charades, O yogi) is a well-known example of Kabir’s couplets (Ajab Shahar—Kabir Project, 2015) that calls for holy persons to leave behind the charade of being above others and to abandon fake posturing. It caustically calls out the myriad ways in which human beings fool themselves by expecting the achievement of inner purity through superficial forms and practices. Sufi poets like Allama Iqbal protested earthly and divine inequities, calling attention to the common person’s suffering with couplets like:

Poverty, taunts, ignominy stare us in the face, Is humiliation the sole reward of our suffering race...

They pledged their hearts to you, what is their return? Hardly had they stepped inside, when they were exterminated. (Rabe, 2016)

Kabir wrote in the 1400s and Iqbal composed his poem in 1909, but these are still sung in contemporary times. Searing slogans and chants marked the call to join the Indian Independence movement. “Vande Mataram” (Mother, I bow to thee), penned in Sanskrit by Bankim Chandra Chatterjee, and “Sarfaroshi ki Tamanna” (The desire for rebellion), by Bismil Azimabadi in Urdu, became calls to revolution and independence.

The latter is a fiery poem of eleven couplets beginning with words that translate to “The desire for revolution is in our hearts. Now it remains to be seen what strength lies in the arms of our executioners,”¹ and was most recently used in the Pakistani Students Solidarity March in 2018 and the Indian Citizenship Amendment Act (CAA) protests in 2019 (Ali, 2019). The clarion calls, in these evolving literary and musical forms, for *azaadi* (freedom, independence; Urdu) and *swarāj* (self-rule, self-determination; Hindi), continued past independence, across South Asian borders—as calls to action, war cries, laments, and personal experience storytelling—firmly establishing grounds of protest culture in anti-colonial South Asia.

The vocality of womanist and feminist participation in this type of protest culture employing ideals of *azaadi* and *swarāj*, against all forms of fascism, is evident. A Pakistani ghazal singer showed up at Lahore’s Alhambra Arts Council in 1986 in direct defiance of authoritarian head of state Zia-Ul-Haque, and under threat of execution sang Faiz Ahmed Faiz’s poem to a frenzied crowd of Pakistani citizens:

Jab Zulm-O-Sitam Ke Koh-e-Garan, Rooyi Ki Tarah Ud Jayenge, Hum Dekhenge... Sab taj uchalay jaaengay, sab takht giraaney jaayenge...

(We, shall witness ... When high mountains of tyranny and oppression turn to fluff and evaporate ... when the heads of rulers will be struck, flinging crowns in the air—and thrones will be overturned...)

This poem arose as a mass cry once more on January 9, 2020, in Delhi’s Shaheen Bagh in India, as hundreds of women gathered to protest the CAA and nationwide National Register of Citizens (NRC) proposed by India’s ruling government, which is supportive of a Hindu-centric nation (Ahmad, 2020). Shaheen Bagh has since become notorious as a site of government oppression after violent police action.

This foregrounding of women’s activism through rhythmic chanting and poetics was also visible in 1991, at the Women’s Studies Conference in Kolkata’s Jadavpur University, where feminist activist Kamala Bhasin chanted a call for freedom, drum in hand and surrounded by women chanting with her:

Meri behane maange azaadi, meri bachhi maange azaadi, naari ka naara azaadi.

¹Unless otherwise indicated, all translations in this chapter are my own.

(My sisters want freedom! My daughter wants freedom! Every woman's slogan is freedom!) (Chatterji, 2018)

One can see how the rhythmic chant works in an Anglicized version as well, which Bhasin chanted thirty years later, in the face of the protests against sexual violence in 2016: "From patriarchy: azaadi; from all hierarchy: azaadi; from endless violence: azaadi; from helpless silence: azaadi!" Bhasin credits inspiration for this chant to her feminist counterparts in Pakistan and notes these chants are "not just for freedom from the negative aspects of society but also freedom for positive things like walking freely, talking freely, dancing madly, singing loudly, for self-expression, for celebration" (Dutt, 2016, para 4).

This chant of "azaadi" set fire the popular imagination of youth today with the televising of student union leader and PhD student Kanhaiya Kumar's rallying call at Jawaharlal Nehru University (JNU) in 2016 (Mango News, 2016). The effectiveness of this chant lies in its simplicity; one need only add "azaadi" to any social evil that must be fought. For instance, Kanhaiya Kumar led the call with: *Bhookmari se—azadi* (From hunger—freedom!) and *Jaatwad se—azadi* (From casteism—freedom!), *Hum le ke rahenge—azaadi, tum kuch bhi kar lo—azaadi!* (We will get it at all costs—freedom! No matter what you do to us—freedom!). Kumar's rally for Indian youth to be more politically vocal and active came in a sociopolitical atmosphere of increasing public unrest around the Bharatiya Janata Party (BJP) government's rhetoric and policies that impacted casteism and religious fundamentalism, regional communal harmony, and economic distress caused by demonetization. Youth participation in protests against government policies and rhetoric increased when Kumar was officially charged with sedition and arrested for his leadership in the protests at JNU (Burke, 2016). Police violence and aggression on university campuses and the arrest of student leaders in Muslim educational institutions in retaliation to Kumar's very public defiance quickly followed. These were widely televised and recorded on hundreds of cell phones, and rapidly shared on social media via YouTube, Twitter, and WhatsApp. What was labeled by the government as sedition became a symbol of citizen protest. In the same vein as the azaadi chant, a surfeit of rap songs and spoken-word slams in multiple languages began appearing, performed live in public rallies, recorded and shared via social media, and receiving increasing attention from the public and politicians.

Democracy is a messy endeavor, especially for a young multicultural, multilingual, and postcolonial nation; India gained independence in 1947 and has been struggling to reconcile religious/ethnic lines and regional autonomy ever since. The state tries to establish a feeling of nationalism in the populace; the populace's resistance of fixed definitions of patriotism and rejection of exclusionary nationalism is a complex discourse (Vaishnav, 2019). This struggle of contemporary India is reflected in the protest culture of its rap music.

From the ongoing conflict in Kashmir, Maoist rebellions of Indigenous and tribal groups, protests against poverty and casteism, and the Saffronization² of India—whenever and wherever dominant ideologies have worked to repress the inherent diversity of the region, or institutional corruption has overwhelmed the public—artists have consistently responded. Working as soft diplomacy across national and regional borders, they address questions of heritage, tolerance, hybridity, and rebellion, by calling upon cultural memory (Tamm, 2019) and remixing repertoires from the past with current influences and styles of expression. Poetry and music have been forms that have most effectively captured the voice and the imagination of the people and—presented on social media and in signs at rallies—have had a powerful impact on the social imagination of South Asia, especially among the youth.

RAP, HIP-HOP, AND THE DIGITIZATION OF PROTEST CULTURE: SOCIAL MEDIA AND SOCIAL MOVEMENTS

The proliferation of digital technologies in the public realm in the 1990s has changed the ways that people function at individual and social levels. New information and communication technologies (ICTs), from email to WhatsApp and Snapchat, allow for photographs, videos, audio, and other types of files to be shared instantly, across and beyond individual social networks, impacting personal and social perceptions, ties, and interactions. Repercussions can be felt in all spheres of life, including the organization, participation, and response to politics and social movements. Since the rise of social media, which started in the mid-2000s, the proliferation

² Saffronization refers to the dominance of Hindutva in the current Indian government led by the BJP. Saffron is a significant color in Hindu religion and Hindutva calls for a Hindu-centric cultural, national, and religious identity. The term refers to the conflation of a geographically based cultural and national identity that centers Hindus.

of distributed content development, dissemination, and management as an alternative to traditional media platforms has created a media ecology that can highly accelerate or impede collective behavior and its displays. ICTs, which include the internet, the World Wide Web, cell phones and short messenger services, Instagram, Facebook, and other forms of social media and social networks, have become a powerful tool for organizers of social movements (Carty, 2015).

According to the political scientist and sociologist Sidney Tarrow (1998), social movements can be understood as a sustained collective articulation of resistance to elite opponents by a plurality of actors with a common purpose, key to which are mobilizing strategies and tactics. Activists have always employed technology to their benefit—from Gandhi inviting world media to televise and report the 248-mile Salt March in 1930, which influenced world support for Indian independence from the British, to Kanhaiya Kumar’s televised arrest at JNU in 2016, and the conflict-ridden response to peaceful civil disobedience at Shaheen Bagh in 2020.

These same technologies have been used by public authorities to surveil, police, and control the activities of particular demonstrators. This makes it important to understand the complex relationship between ICTs and social movements, especially in what is purportedly a post-truth era where what is shared in a digitized culture is highly mediated, and digital personas and lives are not always reflective of personas and lives in the physical realm. This makes any digital encounter or interaction possibly contradictory or contentious (Melgaço & Monaghan, 2018; Reed, 2018; Safi, 2019). Thus, political parties can appropriate an anti-establishment call for azaadi in a political campaign advertisement for their own ends, on the same platform and thread—for example on Twitter—as where the dissenting public digitally mobilizes (Kapur, 2019).

Cultural memory prompted Kanhaiya Kumar to employ the power of azaadi in his activism. The remixing of his speech and chant into a hip-hop format, layered with a Punjabi folk refrain, along with visuals of various protest marches and sit-ins around the country posted and reposted on ICTs, brought it to the forefront of the national imaginary (Creative Commons, 2016). The impact of this same remix was considerably lessened when it was depoliticized, by changing the context from Maoist-leaning student agitations to poverty in Mumbai slums in the hit Bollywood film *Gully Boy* (Excel Entertainment, 2019), which showed the rise of a rapper from the slums of Mumbai. This film was based on the lives of two

prominent Indian rap artists and effectively brought out protest-culture Indian rap from the underground into the mainstream. The film and its music revealed a glimpse of the deep impact of hip-hop on disempowered Indian youth from its inceptions, in the 1970s in the Bronx, to the *desi* (South Asian) stylings of artists based in South Asia and its diaspora. The latter, in the early 2000s, combined the spoken-word forms of Punjabi folk music with hip-hop genres like rap, making it part of South Asian diasporic youth culture.

Marketing and consumer culture scholars Carol Motley and Geraldine Henderson (2008) suggest that the fundamental essence of hip-hop is shared by marginalized groups across the world. This indicates an intersectionality—a resonance in this creative form emphasizing the spoken word. The authentic roots of rap and hip-hop as protest culture reverberate across India through its digitalization even though physical distances between artists and audiences remain due to political and military tensions, as in Kashmir and the northeastern states of India; linguistic barriers between Tamil Nadu and Maharashtra; rural and urban divides; and myriad other reasons. There is a rich history across Indian states and caste lines, of vernacular and Indigenous protest music, that shows up in their current music (Damodaran, 2020). This exemplifies the relationality of *dhvani* and *spota* as an artistic, aesthetic experience.

I conclude this section with excerpts of popular adaptations of traditional and contemporary styles into glocal poético-musical forms in calls and responses to action across South Asia's diverse regional cultures, from Kashmir, Tamil Nadu, Meghalaya, Maharashtra, and Assam. I offer these as sources for curricular engagement for teachers interested in examples of artistic strategies of social and civic engagement that combine traditional forms with new media and genres. They may also be used to engage students with current issues and sociopolitical happenings through socially engaged art in the South Asian region.

In 2010, Roushan Illahi aka MC Kash posted his breakout hit “I Protest” online, relating the realities of insurgency on Kashmiri youth.³ He sang in English, listing the names of youth killed in military maneuvers by the Indian army. Realizing through ICT responses that his use of English was excluding many of the people he meant to speak to, the artist

³The original post has since been taken down, but the song is now available on the ReverbNation website: <https://www.reverbNation.com/davoodkashmiri/song/5182743-i-protest-remembrance-by-mc-kash>

responded by collaborating with Sufi group Alif. In “Like a Sufi,” Kash sings in English, and his staccato tones, rendered in rap stylings heard from US-based artists, are juxtaposed with a Kashmiri refrain and a soulful Sufi refrain in Urdu.⁴

Even though he raps in English, Illahi’s style is similar to the Kashmiri folk style called Ladi Shah, which is lyrical storytelling with little to no instrumentation and is soulful and spiritual (“MC Kash Raps for Kashmir Protest Victims,” 2010). His success inspired other Kashmiri youth to take up rap and hip-hop as their weapons of choice to fight for the freedom to decide their own futures, to protest their countless deaths (McCarthy, 2017), and to battle what they experience as marginalization due to politics.

Arivu is a leader of the Tamil hip-hop scene. As part of the group Casteless Collective, he tears apart caste-based politics and armchair activists (Muralidharan, 2020). Their song “Kalla Mouni” is “a sarcastic take on the people who just dip their toes in social movements and protests for the sake of a ‘trend’ and move on without really doing anything for the cause,” according to the text under its YouTube video (The Casteless Collective, 2019).

“Anthem for the North East,” released from Meghalaya in 2016, featured three rap groups from Meghalaya: Khasi Bloodz, Symphonic Movement, and Cryptographik Street Poets. It went viral, drawing attention to the popularity of this genre of music and raised awareness on socio-political issues being faced by Meghalaya, such as poverty, unemployment, drugs, and violence. Rahul Rajkhowa from Assam (also in northeastern India) raps about his own family’s victimization in the CAA and NCR bills (Rajkhowa et al., 2019), which are basically calls for a national register and a proposal to exile anyone who cannot provide proof of citizenship—an impossible task for many rural people who have never gone through a formal documentation process but have lived in India for generations.

“Warli Revolt” is a call to protect the rights of the Warli tribe in Maharashtra. It is performed in Marathi by the artist Swadesi and features Aarey tribal chieftain Prakash Bhoir (Swadesi Movement, 2019). They rap about land grabbing by the government in corporate interests and the erasure of tribal ways of life. The video of the song animates the famous folk art of Warli painting, which depicts the life and beliefs of the Warli tribe.

⁴This song and its lyrics are available on the Kasheer Lyrics website: <https://kasheer.net/lyrics/like-a-sufi-lyrics/>

The examples above represent a sliver of the prolific adaptation of rap and hip-hop into more traditional forms of poetic and musical protest cultures in India today. They represent how artists across multiple languages, with multiple glocal musical influences, speak to a wide swathe of social ills that need collective participation and action, as grassroots activism and active civic participation in sociopolitical life (Kundu & Khan, 2020).

The common factor of layering traditional art forms with contemporary issues, and local genres with global, demonstrates *dhvani*—an aesthetic experience of resonance—that rises through the *sphota*—a reverberation of shared experience of injustice and protest culture—even though the particular artforms and particular histories of injustices may vary, and despite regional linguistic understanding being limited. These are examples of how artists adapt, remix, collaborate, and make local foreign-but-resonant refrains and experiences, to create a link of solidarity in social and aesthetic experience across cultures. *Sphota* and *dhvani* are the emotions felt within the listener and the evoked response creates an aesthetic connection between youth in South Asia to other parts of Asia, North America, Africa, Europe, and elsewhere. It is what connects the diaspora to their homeland.

The experimental nature of these examples and their refusal to be bound to a single tradition also make them intriguing examples of inter-media art.

RELEVANCE TO ART EDUCATION

In the previous sections, I introduced the aesthetic theory of *dhvani* to provide contexts for the poetic arts in India and historical precedents of poetics as hybridized forms of protest culture. I defined social movements and ICTs and provided specific examples of hip-hop and rap as exemplar artifacts of protest culture in a digitized contemporary India. Next, I present implications of this information for art educators and conclude with suggestions for engaging students in a globalized approach.

The arguments and examples I have presented in this essay illustrate the following points, which could also be used as curricular ideas:

1. Multiple cultures and histories are layered together in multimodal representations of lived experience within and across national boundaries.

2. Digitized ICTs enable the movement of information and creative strategies across the globe to influence and drive glocalized responses to local issues.
3. A particular art form can evolve beyond its formal and cultural foundations, with the infusion of other cultural forms that have aesthetic resonance with its core imperatives and may translate as cultural appreciation rather than appropriation.
4. Solidarity can be built across cultural specificities, to create social movements out of protest culture steeped in artistic production and response.
5. Consider inclusive teaching of artistic and aesthetic systems that are normally seen as “other” or foreign.

Research on globalization in art education reveals that students benefit from learning about other cultures in ways that connect to their own cultural experiences, in order to extend their spheres of knowledge, to become active participants in social and cultural change (Shin, 2016). The South Asian diaspora is among the largest growing immigrant groups in the US and trade relations between India and the US have only grown over the past two decades (*Demographic Information*, n.d.). The South Asian diaspora has also grown over the past century in other nations that were part of the British Empire and in the United Kingdom. Politically and economically, a deeper understanding of the regions represented in the expressions of protest culture would be beneficial to students around the world as they grapple with the effects of colonization. The study of represented regions, their issues and complex histories, and civil discourse, expressed through the adaptations of poético-musical forms like the ones presented in this chapter, honed by protest culture across geographies, enable points of connection and comparative analysis of diverse cultures and their connected responses.

Access to these creative productions and the discourses surrounding them on digital spheres can be pushed toward cross-cultural engagement online, through projects involving research, dialogue, and creative responses by students, on the evolution of art forms through cross-cultural translations and fusions. Investigations into the development of movements through translations of particular artworks, such as those illustrated in the adaptations of the azaadi chant, can lead students to research skills in scrutinizing truths and post-truths in the disseminations and

appropriations of information online and to introspection on their own active or passive presence on social media platforms.

Finally, the examples of the multimodality and interdisciplinarity of Indian aesthetics in this chapter reveal traditions and roots of art history that are apart from the normative Eurocentric approach to art history and aesthetics. The nature of contemporary art is interdisciplinary and interactive; conversations on the social life of artists and their continued relevance in society today as socially engaged global citizens (Furtado, 2018) would be pertinent, presenting students with another aesthetic approach that avoids binaries of visual and performing arts in finding creative civic participation. Teaching the many structural formulae in the Indian poetic forms such as sher, ghazal, and qawwali infused into rap and hip-hop stylings would also expand the technical vocabulary and skill of students in intermedia practices that combine performativity and visuality. To be clear, I am not advocating for the specific teaching of Indic poetics and rap and hip-hop as synchronous, nor promoting the Dhvani school of aesthetics over others; I provide this essay as one example of how we, as arts educators, might become more inclusive of aesthetic and artistic systems other than the dominant European ones taught by default as “Aesthetics,” as a result of colonial education systems, and to encourage our students to examine the power of intermedia arts in civic engagement.

Owing to the COVID-19 pandemic, most of the world’s social and civic life has shifted online more starkly than before. This tendency will continue in many ways, in a postpandemic world, given the shifting sands of health, politics, and economics. However, these struggles continue to impact the physical world. Connecting the two across cultural and geographical boundaries in an art form as cathartic as poético-musical forms combined with the visuality and imagery of collective action would prove an effective way to connect people to life both on and offline.

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Disruption, Innovation, Creativity, and the “Right Thing” in the Age of Global Media Arts

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Facebook’s “move fast and break things” (as cited in Baer, 2014), Amazon’s “Work hard. Have fun. Make history” (as cited in Huddleston, 2019), and Google’s “Do the right thing” (as cited in Lawler, 2015) are the mottos of three of the largest technology companies in the world.¹ Instead of living up to their egalitarian models, they act like the big media giants of previous generations, shaping the cultural landscape through their business interests (Taylor, 2014). How should we interpret these corporate mottos when these companies control our data, allow their platforms to be sites for psychological and political manipulation, and perpetrate mass surveillance activities? How can art educators engage with these ubiquitous global media platforms in critical, cognizant, and

¹ Google and Facebook have since changed their conglomerate names to Alphabet (2015) and Meta (2021). As of this writing, Google and Facebook are the more commonly used names for these companies.

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possibly subversive ways? This chapter will describe how the global media pursuits of five big technology firms—Facebook, Amazon, Apple, Microsoft, and Google, coined as FAAMG by the financial firm Goldman Sachs (Molina, 2017)—actively engage in de-democratic behavior through authoritarian manipulation, algorithmic control, ubiquity, and their own antitrust business practices. This chapter will also provide examples of digital media artists who are critical, cognizant, or subversive with these technologies to show how art classrooms can be spaces of resistance to global media control.

The market value and influence of FAAMG continue to grow, particularly during the COVID-19 pandemic when global economies became more dependent on technology as a social-distancing method (Molla, 2020). However, with FAAMG's elevated status of keeping the world connected during the pandemic, they are also recognized for their participation in spreading misinformation globally (Bond, 2021), creating targeted messages from user information (Albergotti, 2021), enacting algorithms to negatively impact minority or vulnerable populations around the world (Simonite, 2021; Towers-Clark, 2020), and engaging in anti-trust practices (Karabell, 2020; Solsman, 2021). As five of the largest companies in the world, each with direct ties to kindergarten to grade 12 (K-12) education, it is important to unpack and understand how students are impacted by FAAMG and think about ways art educators can provide meaningful methods of resistance to their global media practices.

To give the reader an idea of FAAMG's global reach, the majority of the world's web traffic (57%) (Taaffe, 2021), social media (82%) (Statista, 2022c), internet searches (90%) (Statista, 2022b), and smartphone software (99%) (Statista, 2022a) are on FAAMG platforms. Because of their massive size, diversified technologies, and immense consumer base, FAAMG's ability to gather, control, and manipulate users' activities make them difficult to avoid.² I will frame the vast influence of these five tech firms in our daily lives, by drawing from Shoshana Zuboff's (2019a) research and concept of surveillance capitalism, as well as other reporting, research, and scholarship of FAAMG to highlight how they collect and use data to embed themselves within our digital ecosystems, creating anticompetitive practices, and making them vulnerable to autocratic manipulation and disinformation. To counter FAAMG's pervasive presence, media

²The reach of FAAMG is more limited in mainland China, where Google and Facebook are blocked.

theorist Anna Watkins Fisher’s (2020) framework of “parasitic artistic behavior” is helpful to understand how artists and art educators can create forms of resistance while still participating in a global digital media society. I will conclude by sharing works by digital media artists who use resistant practices to FAAMG.

STATEMENT OF THE FAAMG PROBLEM

The use of FAAMG products in the North American art education literature, particularly social media, has focused primarily on the ability to create content and project an identity, noting the promises and pitfalls of the ability to create, develop, and control an online presence (Carpenter & Cifuentes, 2011; Castro, 2012; Fountain & Nordlund, 2019; Freire & McCarthy, 2014; Knochel, 2013; Sweeny, 2009). However, less frequently discussed is the ability of the digital platform creators to restrict, manipulate, and control your digital presence, and how they refine their technologies to maximize tracking and increase consumption rather than as tools for broader use. Much of the art education research (my own writing included) is hopeful, optimistic, or possibly naive about the ways these companies operate rather than focusing on how Big Tech uses data (Cress, 2013; Duncum, 2015a; Manifold, 2021; Patton, 2005; Patton & Knochel, 2017; Shin, 2016; Unrath & Mudd, 2011; Ward, 2010; Ward & Blanchfield, 2018). Concerns over privacy, ownership, and toxic internet culture are common in the art education literature (Delacruz, 2009; Duncum, 2015b; Freire & McCarthy, 2014; jagodzinski, 2008; T. J. Smith, 2020; Wilks et al., 2012), but what is less prevalent is an awareness of how Big Tech algorithms manipulate users globally and how we are constantly in Big Tech’s ubiquitous reach.

The companies of FAAMG operate on a continuum of economic models, moving from late-stage capitalism where multinational corporations focus on creating goods for mass consumption (Jameson et al., 2012), to a digital economy of surveillance capitalism, a system centered around the commodification of personal data for profit. As Tristan Harris, former design ethicist for Google states, “we have moved away from a tools-based technology environment, to an addiction and manipulation-based technology environment” (Orlowski, 2020, 0:30:21). This is problematic in our role as art educators to support students’ use of accessible digital media tools for creative self-expression and experimentation. Instead, the

tools can take and analyze students' data to prey on their emotional states, obfuscate facts, and amplify the spread of disinformation.

Online K-12 educational platforms like Google Classroom, ClassDojo, Seesaw, or even image editing tools like Pixlr are the basis of how art educators teach digitally, particularly when schools operated remotely in virtual classrooms during the COVID-19 pandemic (Lee, 2020). Before the pandemic and the shift to online learning, American eight-to-twelve-year-olds spent on average 4 hours and 44 minutes on screen media daily outside of school, while teens averaged 7 hours and 22 minutes of additional screen time (Siegel, 2019). Globally, FAAMG controls many of the platforms K-12 students regularly use in and out of school. Facebook and its Instagram social media platform are the most popular online social media platforms globally. Apple owns some of the world's most popular smartphone, music, computer, and headphone hardware and software. In addition to being the largest digital marketplace outside of China, Amazon has significant media platforms with Prime Video and Twitch. Microsoft has significant global market share with the Xbox game console coupled with the world's most popular personal computer operating system and productivity software. Google dominates internet searches globally, and with digital media like YouTube, the Android and Chromebook operating systems, and a host of other apps, it is hard to avoid FAAMG in daily life. As we would expect ethical standards of practice from our schools, after-school programs, and children's entertainment, vigilance should be taken toward how digital media companies are practicing on our children via their platform interfaces and data collection, not just the content they host or recommend.

To compare personal awareness, in varying degrees, people are mindful of what they put in their bodies, things they use, and daily physical activities. In our digital age, our photos, travel, transactions, and media views are part of a digital feedback loop with corporations about our physical and mental behavior and consumption. When food is ordered using a smartphone app, information about the food, order time, location, smartphone model, bank accounts, and other forms of personal metadata like name, age, and education are being collected as part of the food purchase. Some of the information is helpful and useful to the consumer and the company to make the transaction secure and speedy, but other parts of that metadata, or "data exhaust" (Zuboff, 2019a), are unneeded. Forms of data exhaust are captured to create a more granular understanding of the consumer. Those pieces of data continue to follow the consumer into

other aspects of life and can be connected to other apps and transactions. Because these bits of data can be put together to provide consumers with targeted messaging, vigilance is required from consumers to manage their data and the algorithmic narratives created from purchases, clicks, and “likes.”

Collecting and using data exhaust as a form of surveillance capitalism is not unique to the FAAMG platforms, but their corporate size and structure allows FAAMG to create additional tools of manipulation within their product ecosystems, bringing rise to the possibility of democratic decay or de-democratization. Whether it’s embedding sensors into products to record or track users, keeping users engaged with “sticky” algorithms, or creating curated digital ecosystems to grow market share, FAAMG’s primary goals for making their products ubiquitous cede social responsibility for their globalized technologies. Instead, FAAMG focuses on optimizing corporate growth, generating revenue, and maintaining user engagement as their real corporate mantras, while extending their monopolies by putting up roadblocks for other companies to compete and governments to regulate, limiting their own responsibility to the public.

GATHER AND MANIPULATE

The incredibly rapid growth of digital technology as essential to our daily lives can be mapped onto the ascension of Facebook, the youngest of the FAAMG firms. Facebook began in 2004 as a college social directory and grew to reach nearly one-third of the world’s population with 2.9 billion users by 2021 (Ortutay, 2021). As FAAMG have grown in size and wealth, they have expanded to create digital devices and apps separate from their original core business of social media (Facebook), e-commerce (Amazon), computers (Apple), productivity software (Microsoft), and search engines (Google). These companies create new global media paradigms with their research, products, and services to gather, manipulate, and control consumers.

According to Zuboff (2019a), the economic model of surveillance capitalism turns personal digital data into a commodity for targeted advertising, social manipulation, and surveillance. Using data like personality profiles and emotion cycles, researchers can find out more about a consumer to anticipate their future behavior. Institutionalized at Google in 2003 through their AdSense advertising program, Google’s “black box” algorithmic prediction system was used to help advertisers improve sales.

Data from future behavior markets collected from users become so lucrative that nearly all of Google and Facebook's market value is derived solely from this "black box" algorithmic advertising model. For example, according to antitrust scholar Dina Srinivasan (2019), in its early days Facebook began with firm privacy promises. But now, Facebook states its artificial intelligence (AI) can analyze users' moods and emotions through data collection so advertisers can microtarget by knowing when is the best day, time, product statement, and delivery method to maximize the purchasing impact on Facebook users. For example, Facebook learned teenagers go through specific cycles of anxiety during the week, triggering purchasing decisions as the weekend approaches (Zuboff, 2019b). This level of surveillance and psychological manipulation shows the immense power these global media platforms wield.

The data exhaust from the Internet of Things (IoT), "smart" or "personalized" devices and services with embedded, always-on sensors like microphones and cameras (e.g., Facebook and Facebook Messenger, Amazon's Alexa and Ring, Apple's iPhone and Siri, Microsoft Cortana, and Google's Assistant and Nest), create even larger data models and predictions about a consumer's future behavior. Like Facebook, smart devices were originally intended to be closed systems, not sharing data with third parties (Kidd et al., 1999). But researchers looking at the Google Nest device found one thousand subpolicies to share data with third-party developers and businesses (Noto La Diega & Walden, 2016). This kind of digital data extraction and predictive analysis makes FAAMG the most valuable corporations in the world. Car companies, rental agencies, malls, insurance companies, and other markets are eager to track and predict consumer behavior to maximize profits. However, FAAMG digital devices and platforms are often gatekeeping systems for other industries (e.g., Google and Apple smart devices, Facebook groups, and Amazon Web Services) to gain access to personal data for deeper understanding and manipulation of their users.

CONTROL

Advertisers are not alone microtargeting users of FAAMG's data and devices. Political leaders and advocacy groups from around the world use FAAMG services and devices to create disinformation, disseminate hate speech, and spy on individuals (Singer & Brooking, 2019). Facebook and Google's YouTube are the most visible FAAMG platforms used to spread

messages of misinformation, conspiracies, and hate.³ More people read Facebook’s news feed than all the major newspapers and TV networks combined (Lepore, 2021). Thus, it is critical that the news broadcast on the platform is accurate and factual. However, relying on algorithmic methods to provide user content opens the door for other algorithms to shape user content even further.

Spun off from the University of Cambridge, Cambridge Analytica’s research showed how discrete clues of Facebook users’ demographics (e.g., TV show preferences, movies, and music) could be used to identify individuals prone to extremist ideology (Wylie, 2019). Originally contracted to mitigate the spread of extremist ideologies, Cambridge Analytica was repurposed for political campaigns, most famously hired by the 2016 Trump campaign to catalyze extremist and conspiratorial thinking and encouraging people to join alt-right organizations (Confessore, 2018). Other political leaders and governments have used Facebook as a propaganda and disinformation platform using similar tactics, such as supporting the insurrection at the United States Capitol on January 6, 2021 (Frenkel, 2021), as well as political deaths in India (Purnell & Horwitz, 2020), Myanmar (Mozur et al., 2021), the Philippines (Levy, 2020), and Sri Lanka (Brustein, 2020). In Myanmar, Facebook was free on cell phone data plans, becoming so popular it was seen as synonymous with the internet. The government even used Facebook as a primary method for public service announcements. As Facebook grew in Myanmar, Islamophobic content targeting the minority Rohingya people spread, causing violence and displacing more than six hundred thousand (Levy, 2020). Facebook has responded to these kinds of criticisms by stating free speech is the company’s driving force, but their slow movement or even inaction regarding misinformation and disinformation posted and amplified on their platform causes violence and death (Frenkel & Kang, 2021). Other studies show YouTube and Amazon’s recommendation algorithms also drive users to more extreme content and misinformation (Goujard, 2021; Naughton, 2020).

The logic of the tech giants’ marketplace of ideas are derived from ideologies of Western progress, where societies advance when information is freely available and shared, and the best ideas will emerge and be embraced. Similarly, it is also the basic premise behind public libraries, books, and academic research. Yet as we have seen with unproven COVID-19

³Twitter is absent from this discussion of social media because it is not part of FAAMG.

treatments, anyone can create content to support their self-interest (O’Leary, 2021). Disinformation can be connected to show other “truths” by creating YouTube videos, or websites supporting the ideas. When many people start spreading a false narrative, it trends on Google’s search or Facebook’s feed and becomes part of the mainstream conversation, drawing even more people into believing it. Because of the amount of content being uploaded to the various social media platforms of Facebook, Google, and Amazon, their ability to monitor users and material posted to their platforms is difficult (De Vynck & Lerman, 2021). As a result, these companies have invested and relied on AI to perform content moderation decisions, placate public outcry, and keep their companies growing (Frenkel & Kang, 2021).

LIMITED KNOWLEDGE

AI is defined as intelligence demonstrated by machines, as opposed to the biological intelligence of humans or animals. Google’s search engine, the recommendation systems of YouTube, Amazon, and Facebook, and the voice assistant systems of Facebook Portal, Apple Siri, Amazon Alexa, Microsoft Cortana, and Google Assistant fall under the definition of AI. As of 2021, FAAMG dominates AI acquisitions, accumulating seventy-six AI companies between 2010 and 2021 (*The race for AI*, 2021). FAAMG’s AI projects cover a range of services and industries. For example, in 2018, Google had AI projects in autonomous driving, healthcare, consumer electronics, and finance (Dilmegani, 2018). These AI systems get “smarter” by gathering more and more data, also known as machine learning. From the data collected, these AI systems can adapt and make future predictions based on the data sets they are working from. The problem with this AI model is that these systems rely on data already collected from a limited set of scenarios or segments of the population. For example, when an AI was created to find and remove indecent images on the internet, poorly paid outsourced workers from India tagged same-sex couples as indecent, a cultural norm in India (Metz, 2021).

Facial recognition AI is known to be problematic because the majority of data sets are trained on white males, creating a higher probability of inaccurately identifying nonwhite and female individuals (Ivanova, 2020). These facial recognition AI inaccuracies can have extreme consequences. Amazon’s Rekognition and Microsoft’s Azure facial recognition AI were used by immigration and law enforcement to identify individuals (Hao,

2019) and, after several wrongful arrests of Black men using AI became public, Microsoft and Amazon stopped selling their services to officials (Hao, 2020).⁴

LIMITED COMPETITION

If FAAMG collects users’ personal information, creates algorithms to manipulate the information on their platforms, and creates AI algorithms to identify faces for law enforcement or other purposes, how are they being held to account? Because of FAAMG’s sheer size, wealth, and technological abilities, each of them has been accused of having too much global power and influence, being sued by several governments over their anticompetitive business practices and responsibilities to users (Nadler & Cicilline, 2020). For example, in 2002 Microsoft lost an antitrust case by restricting the use of competing software (*United States v. Microsoft Corp.*, 1999). Apple, Amazon, and Google currently have several high-profile lawsuits over anticompetitive practices (European Commission, 2016; Lomas, 2021; Nicas et al., 2020; Ovide, 2021). Further, FAAMG control 58 percent of the global cloud storage and internet server markets (Peng et al., 2020). These are the computer servers and networks that host the websites, media, and applications in the global digital economy. Finally, Apple and Google control 99 percent of the global smartphone operating system market (O’Dea, 2021). FAAMG is almost guaranteed to be involved with some part of the distribution of digital content, including Netflix, TikTok, Snapchat, Nintendo, Vimeo, or any other global digital media arts company.

RESISTANCE

Beyond getting involved with politics, governmental oversight, and regulation, artists, art educators, and students can create public awareness of FAAMG’s activities through art education and art practices. A form of critical digital making to reveal and critique FAAMG is based on the theory of parasitical resistance (Fisher, 2020). Media theorist Anna Watkins Fisher (2020) describes in her book *Play in the System* that digital platforms have co-opted hospitality as a performative tactic, masquerading as

⁴ Amazon has put an indefinite moratorium on their Rekognition AI, which is still in effect as of this writing.

generosity through user-friendly interfaces while instrumentalizing user data as a form of coercion, or what Fisher (2020) coins as “coercive hospitality” (p. 16). This aligns with Zuboff’s (2019a) surveillance capitalism argument, where the generous “free services” of Facebook and Google, the “smart” AI features in our digital devices, and the “curated” platforms of our app stores all come with the price of users being surveilled, quantified, and restricted by FAAMG devices and services. Fisher’s argument is that this coercive form of hospitality provides opportunities for parasitical resistance.

Fisher’s concept of parasitical resistance is a reconceptualization of Gilles Deleuze’s (1998) “regime of control.” Deleuze believes the control of individuals in modern society is not fixed or located in one place but follows individuals through their accumulated records and personally identifiable information. Fisher (2020) takes Deleuze’s concept of control in the digital age with companies like Facebook, Amazon, and Google’s vast abilities to collect data and sees artistic opportunities to resist their control as a parasite. She sees parasitical artworks as a way to redirect and correct the inequities of their powerful and privatized resources. Fisher argues these parasitic activities predominantly have been taken up by artists at the margins of the system like hacker collectives, feminist writers, and performers. She cites several artists using these parasitic resistance tactics, like Ubermorgen and their work with Alessandro Ludovico and Paolo Cirio (2013) in *The Hacking Monopolism Trilogy*, which consisted of media hack performances designed to exploit security vulnerabilities in Facebook (*Face to Facebook*, 2011), Amazon (*Amazon Noir*, 2006), and Google (*Google Will Eat Itself*, 2005), and point media attention to the companies’ power. By providing theory and artworks embodying this form of critical resistance in the digital age, Fisher (2020) provides a roadmap for others to advance and improve upon.

In her explanation of parasitical resistance, Fisher (2020) acknowledges the parasite is only temporary but can be critically and politically useful. In relation to FAAMG, parasitical resistance can be found in how artists are working within the systems of these global media companies, and the artists’ ability to comment on or expose the forms of surveillance capitalism FAAMG produces. In the next section, I will review some of the artists exemplifying a parasitical relationship with FAAMG.

PARASITIC ARTISTIC BEHAVIOR

Amazon’s Echo and other smart speakers (Google Home, Apple HomePod, Facebook Portal, and Microsoft Invoke) are not recording your conversations, but are constantly listening for a wake phrase like “Alexa.” Smart speaker microphones can be disabled, but only by physically pressing their mute button. Most people don’t do that, so their microphones are on all the time, listening for your commands (Carr et al., 2019). Customers can delete the recordings, but companies are not restricted with the user data (Fowler, 2019). The more consumers use smart devices to play music, turn out the lights, or create a shopping list, the more smart devices learn about users while they listen (Morse, 2019a, 2019b).

The art collective MSCHF creates products meant to humorously critique the world around us (Newman, 2020). Amazon Echo ordinarily captures audio heard in a house, effectively wiretapping a home twenty-four hours a day. MSCHF’s Alexagate (cited in Newman 2020) sits on top of an Amazon Echo and jams its microphones with seven individual ultrasonic speakers arranged and pulsing to overwhelm the Echo with sound so it can’t hear anything else. This extreme intervention reveals how FAAMG corporations enact surveillance through effortless, on-demand automated service, while Alexagate enacts the necessary steps to prevent the ubiquitous surveillance in the home.

Other artists embrace these digital devices in their work, mining their hidden features to develop a collaborative practice. Kate Sicchio, a choreographer and digital artist, combines choreography, dance technology, live coding, and physical computing in her work. *Set an Alarm* (2020) is a score for a performer and the Amazon Alexa personal assistant device (Sicchio, 2020). *Set an Alarm* was included in a project called Voices and Voids, a set of “performative artifacts to challenge AI and machine-learning technologies, and to examine automation through the prism of ‘ghost work’ that constantly support these systems” (Desjardins et al., 2019). Its movement score comes from Alexa’s spoken phrases generated by Google Assistant ghost worker data logs. Ghost work refers to how humans help make AI systems run. Most AI models learn to make correct decisions from supervised learning created from data sets labeled by people called ghost workers. Flagging content, labeling images, proofreading, and tagging text or video are ghost work used to create and improve AI models (Valentine, 2021). As part of the collaborative performance,

Sicchio's piece shows how a smart device can be demystified by revealing the human within an AI system.

Part of the social media algorithm to be exploited using parasitical resistance is the "like" or the "follower" function. Facebook's Instagram can be a lucrative market for social media influencers (Lansat, 2018). Influencers can achieve popularity on Instagram by being a celebrity or creating content that draws an audience. Some influencers purchase followers or likes to increase their online audience and visibility (Field, 2019). Dries Depoorter's *Quick Fix* (2019–2021) is an interactive art installation allowing social media users to purchase likes or followers for Instagram, Facebook, YouTube, and Twitter (Depoorter, 2020). By inserting money in the *Quick Fix* vending machine and choosing the social media platform and account information, the paid purchase adds auto-generated likes or followers to the social media account. The final purchase is saved in a database with the date and location of the exhibition. In this piece, Depoorter asks his audience to question the role of the influencer, social media algorithm values, and what we are willing to pay for status in society.

Jenny Odell is a multidisciplinary artist whose work involves close observation of objects. Some of Odell's work focused on the accumulation of objects and their eventually becoming trash. This has led her to investigate objects at the dump and the history and origins of her own personal objects (Odell, n.d.). Several of her pieces can be understood as event scores, replicable for other artists wishing to interact with FAAMG, like using Google Earth or Apple Maps to find locations important to you as an artist or art student (Dezeuze, 2002). In her piece *Where Almost Everything I Used, Wore, Ate or Bought on Monday, April 1, 2013 (That Had a Label) Was Manufactured, to the Best of My Knowledge*, Odell (n.d.) has created an Amazon-style webpage of all the objects she interacted with on April 1, 2013. In the final piece, Odell chose to use product photos like those on Amazon or Google Shopping "to highlight the alienation that occurs when one realizes that all of his or her possessions were not only made by strangers far away but are still afloat and available in the marketplace" (H. Smith, 2015, para 6). Odell's critique of FAAMG is the ease with which these platforms can encompass us, providing access to imagery of our planet, every travel route, and almost any product.

CONCLUSION

As Fisher described above, parasitic artistic practices do not overthrow these corporations, prevent surveillance capitalism, or eliminate disinformation. However, the more FAAMG’s practices are exposed, questioned, and explored, the more the public is informed. Media arts pieces critical of Big Tech have existed since the early days of the internet (Patton, 2011). A reckoning for the immense power FAAMG has over our digital lives is coming from increased public awareness and the need for government oversight. Many governments are positioned to challenge the power of these five corporations (Bonnard & Chognot, 2021). As artists and art educators, it is important our audience and students are aware of how FAAMG digital devices and platforms are collecting data and manipulating it for capitalistic purposes and to the detriment of democracy. Through parasitic artistic behavior, artists can actively engage with FAAMG technologies as an art medium or as an entry point for dialogue about global digital media. By allowing for the parasitic artistic behavior of FAAMG, global media arts audiences have the opportunity to develop a greater understanding and awareness of the surveillance capitalistic technologies around them and of ways to question, disrupt, and critique their power.

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Zooming In: Learning with Videoconferencing as Posthuman Pedagogy

Aaron D. Knochel

On January 6, 2022, actor and musical composer Lin Manual Miranda was video cast into an event on Capitol Hill in Washington, DC, to introduce his cast members from the musical *Hamilton* to perform the song “Dear Theodosia” (Pitofsky, 2022). The event was organized to commemorate the violent insurrection of the previous year at the United States Capitol building. As House Speaker Nancy Pelosi introduces Miranda, gesturing to a screen hanging in the hall where attendees are to direct their attention, there is a distinct sense of being nested within a tunnel of screens: I’m watching this from a C-SPAN Twitter video showing Pelosi’s introduction, which then jump cuts to Miranda in a home setting introducing the song within a regenerative democratic framing for the commemorative Capitol event, which then cascades into various screens in animated tiles that present the talented cast singing individual verses and harmonized choruses of various composition. The video of the song is

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composed of previously recorded video-cast performances that have been edited together, evidenced by the precise synchronization and layering of the actor-performing-video tiles that move and animate the screen in various grid and layer formations. Actors are casually dressed, sporting earbuds and headphones, emitting beautiful voices within everyday settings of domesticity: kitchens, family rooms, and backyards. A still image of the *Hamilton* stage production is layered within the animated video tiles as one of many layers, but mostly these people are at home occupying personal space broadcast to the world.

The cascade of screens displaces locations, providing video snapshots performed through mediascapes that have become all too familiar during a global pandemic. As the world navigated waves of the COVID-19 pandemic, responding variously through lockdowns and forced closures, people went to their homes and turned a camera on themselves. Outside of a wide array of vital workers that needed to go to work, many found themselves broadcasting from their couches: monitoring business meetings and kids' school schedules as everyone jumped on a computer to connect with spaces that were now a threat to their health. Among other things, the COVID-19 pandemic has highlighted a global digital communication network that permeates our commercial and social transactions. Take, for example, videoconferencing platforms: Zoom, a popular provider in this market, had ten million daily meeting participants in December 2019, which grew to three hundred million in April 2020 (Warren, 2020). Google Meet and Microsoft Teams have also experienced significant increases in daily participants during the pandemic (Peters, 2020; Thorp-Lancaster, 2020). With this explosion of growth, many business prognosticators have positioned videoconferencing, and its bundled potential with augmented and virtual reality, to be the future of work (Arruda, 2021).

And while the pandemic has catalyzed the use of videoconferencing throughout the world, research in education has been grappling with videoconferencing for quite some time. From Lynne Coventry's (1995) attempts to analyze the impact of videoconferencing within educational settings as they became more stable through advancing video compression and low-bandwidth integrated services digital network (ISDN) protocols at the time, there proceeds twenty-five years of scholarship on the topic. Much of this early work is focused on videoconferencing and its impacts on distance education (Motamedi, 2001; Osborn, 2001). However, as the field matures and the technologies advance, there is a more concerted effort to conceptualize innovations and impacts to pedagogy that appear

to filter into many forms of education well beyond distance-learning frameworks (Lawson et al., 2010). The major difference between these considered avenues for education exchange and the present is the sheer volume of adoption. The pandemic forced unprecedented numbers of students and teachers into a distance-learning environment. Teachers, with little time to prepare, were forced to be both instructional designers and pedagogical facilitators using technologies that few had experience using. Additionally, this phenomenon makes an impact at a notably international scale. From Peru (Del Rio-Chillce et al., 2021) to South Africa (Mpungose, 2021) to Vietnam (Nguyen & Nguyen, 2021), the 2021 educational research literature has remarkably similar empirical studies from around the world analyzing the use of videoconferencing during the time of the COVID-19 pandemic. In addition to this rapid and massive global adoption of videoconferencing during the pandemic, another aspect that makes this current trend unique is just how deeply it impacts primary and secondary education. While this surely was a global phenomenon, research literature coming out of the United States focused on K-12 schools points to a chaotic massive adoption of online and remote learning with many challenges, including lack of internet connection for students; ill-prepared teachers both poorly trained in online learning platforms and lacking a robust research literature to consult concerning videoconferencing and K-12 students; and the unknown impact of parental involvement, which became essential to home delivery of the curriculum (Huck & Zhang, 2021).

Minus the prognostications of Vincent Lanier's (1976) speculation that videoconferencing will replace in-person meetings of the National Art Education Association by 2000 (he was only 20 years off!), research literature in art education, in earnest, mirrors many of these same developments as a review of broader education focus—from early adopters speculating on the impact of videoconferencing technologies in education (Rogers & Irwin, 1997) to focused analysis that reflects the impact of videoconferencing on teacher education (Roland, 2010), videoconferencing in various arts such as dance (Parrish, 2008), and particular learning spaces in the arts such as museum education (Barbanell et al., 2003). Also evident in the recent literature is a strong global framing as to the impacts of the pandemic, distance or online learning and art education: from Iran (Bigam et al., 2021) to Turkey (Ergin et al., 2021) to Ukraine (Xie et al., 2021). Art education scholar F. Robert Sabol (2021) highlights threats to teacher health and safety and student social emotional learning in his

assessment of the impact of the pandemic to art education, but also highlights the lasting unknown effects of “the tornadic impact of the pandemic on [the] educational progress of students” (p. 6).

These aspects of videoconferencing present stressors that are manifest as a part of the designed environment of videoconferencing platforms like Zoom or Microsoft Teams, and it is on this designed software environment that I want to place our attention. Learning spaces, filled with human and nonhuman participants, have always been a matter of curricular and instructional design, but I am provoked by the radicalization of curriculum and accessibility when we take seriously our role as *designers*: how might we think curriculum anew as a totalizing architecture of the learning space that involves an assemblage of learners, teachers, things, and discourse when we forefront our role within an assemblage of designers in this process? And how might we learn from the massive and global adoption of videoconferencing that was a result of the unprecedented school closures of the pandemic about the assemblage of agencies that constitute curriculum design? I am parsing curriculum and instruction design as an integrated process that considers the course of content and materials (curriculum) with the methods and practices of delivery (instruction). And while instruction appears concerned with the practical and curriculum with theory and content, both have ideological entanglements that are important to consider (Petrina, 2004).

To better understand the role of videoconferencing in the “what” and “how” of teaching (Reigeluth, 1983), I follow a posthumanist analysis of videoconferencing platforms that have risen to such prominence during the pandemic. My logic and argumentation will continually assume a multiplicity of agentic forces at play within the worlding of learning and curriculum making. As learning is happening and when curriculum is conceived, facilitated, bargained, or revised, epistemological and ontological forces are at play, entangled in the making of *Bildung* or the totalizing effects of the learning journey as both knowledge negotiation and institutionalization. We, learners and curriculum designers and thinkers, are alike bound within these assemblages, negotiating active material relationships while roiling through the subconscious striations of making ideas as a creative, productive force (jagodzinski, 2015). The posthumanist perspective presented here situates research and practice as a nexus of the material-psychic world, offering humility in decentering anthropocentric conceptions (Petitfils, 2015). To theorize curriculum design in the media arts, this is a critical point: design is a nexus of posthuman practices

wherein humans and nonhumans manipulate immanent relations involved in the doing of education with particular import to the technological actants¹ that often populate and differentiate learning in the media arts.

The rationale for such an exploration comes from two threads of concern. First, theorizing posthuman perspectives in education relates variously to the critical project of negotiating our orientations to anthropocentric thought in how it may inform our relationship to the nonhuman world but also the ways that humanism has ideologically over-positioned us as inheritors of that world. Second, as a speculation specifically situated within discourses of media arts education and global perspectives, the massive and rapid adoption of videoconferencing on a global scale within education may be instructive for understanding emerging relationships in media and learning and help to highlight what the arts part of that assemblage offers. In other words, if virtually all education is now mediated education, what might the media arts offer? My attempts in the following will pursue videoconferencing as a suddenly vital member of this assemblage and to build a conception of its possible contributions to curriculum and instruction in the media arts and beyond.

METHODS OF SOCIAL ASSEMBLAGE

If we are to pursue videoconferencing within the posthuman assemblage of curriculum making, then the question becomes where to focus in the practical business of curriculum and instruction. What I propose is following boundary shifters (Pinch, 2008) that linger within the nexus of learning: the material agents that are doing something within a site/cite/sight (jagodzinski, 2006), where practices and performances of learning proliferate. In this chapter, I construct a social ontology (DeLanda, 2002) of videoconferencing platforms as boundary shifters for education in the spaces of online and hybrid learning. In this construction, I rely on actor-network theory (ANT) (Latour, 2005) to see videoconferencing as a network being: a constellation of social entities and experiences that are in complex causal and emergent relationships. Critical to my endeavor is understanding the strange and unfamiliar ways that videoconferencing platforms pedagogically perform as collaborators in the curriculum and

¹Actant is a term originating in literary theory and taken up in actor-network theory (Latour, 2005) to refer to human and nonhuman actors contributing to particular social formations and the dynamic interrelationships that are formed.

instruction design process, augmenting human relationships, materializing hidden curricula,² and compelling media arts educators to ask ethical questions that are a part of the pedagogy of art classrooms as techno-performative learning spaces.

However, understanding nonhuman pedagogies and their impact on curriculum and instruction design is difficult. After all, how might nonhumans be caught in the act of curriculum? Here I return to the notion of the network being as a notion of an actant composed of causal and emergent relationships, to develop a methodical attention to relationships of symmetry, anomaly, and durability. Following network beings is paying attention to actant successes and failures, being attuned to the weird and disorienting, and paying particular attention when things persist.

Reconstructing social ontologies of software environments such as videoconferencing platforms may suggest to some a startling displacement of human agency as the singular import in understanding media arts learning. After all, literacy discourses in media education have been defined by the humanist narrative of empowerment by accessing cultural power through media representation (Kellner & Share, 2005). Human agency, as a concept that frames human action upon the sociological structures of the world, is reconceived through this extended constellation of actants that includes nonhuman agential forces. As Tara Fenwick and Richard Edwards (2010) state, “ANT does not conceptualize agency as an individuated source of empowerment rooted in conscious intentions that mobilize action. Instead, ANT focuses on the circulating forces that get things done through a network of elements acting upon one another” (p. 21). ANT calls these relational effects translation (Brown & Capdevila, 1999; Callon, 1986), and it is the mapping of powerful translations that is central to understanding any network being.

ASSEMBLING NODES IN THE NETWORK BEING OF VIDEOCONFERENCING PLATFORMS

In the following, I offer three nodes in the social ontology of Zoom, my videoconferencing platform of choice in this assemblage, that may allow us to perceive its agentic contributions to curriculum and instruction

²The concept of a hidden curriculum acknowledges that what students learn goes far beyond what the teacher intends, often including replications of norms, values, and beliefs representative of broader social inequities (Giroux & Penna, 1983).

design. These do not provide an exhaustive view; rather, it is a capture of the prominent *doing something* of Zoom in the online spaces of media arts learning.

The Body and Zoom Fatigue

Videoconferencing augments our many interactions that are part of human communication, and not always in helpful ways. Many users experience mental and physical exhaustion, referred to as Zoom fatigue (Fosslien & Duffy, 2020; Ramachandran, 2021). Communication professor Jeremy Bailenson (2021) theorized four aspects of the Zoom platform that could lead to the psychological consequences of nonverbal overload that appears to cause this fatigue. These include sustained eye gaze at close range, increase in cognitive load, the effect of seeing oneself for sustained amounts of time, and reduced mobility that is a result of staying within the frame of the video lens. All of these aspects create glitches in human communication, and the technological mediation of these exchanges is frustrating that instinctual and finely tuned skill of human communication, which has evolved over time and helped us to survive. Zoom presents many complications to this communication exchange: inability to read body language, the dynamic stacking of the grid that has video feeds moving into different spots on the screen, chaotic multitasking that layers chat features to accommodate side comments, and transmission delays that hinder turn-taking. As associate professor at Virginia Tech and director of its Human-Centered Design Program Steve Harrison states, “You are always making a judgment about how much to speak and when it’s appropriate” (Morris, 2020, para. 12). And while this real-time and constant mode of evaluating when to contribute may be present in person-to-person interactions, Zoom adds so much interference within these transmissions that these stressors tend to compound one another. As journalist Kate Murphy (2020) states:

The problem is that the way the video images are digitally encoded and decoded, altered and adjusted, patched and synthesized introduces all kinds of artifacts: blocking, freezing, blurring, jerkiness and out-of-sync audio. These disruptions, some below our conscious awareness, confound perception and scramble subtle social cues. Our brains strain to fill in the gaps and make sense of the disorder, which makes us feel vaguely disturbed, uneasy and tired without quite knowing why. (para 3)

It is clear that Zoom fatigue indicates that pacing, scaffolding, and time on task will need to be negotiated differently than in-person learning environments, and understanding these impacts to learner's attention and engagement is vital.

In addition to these frustrations in human communication, Zoom translates the body in spatial and temporal qualities as well. Adding to the delays that augment temporal relationships and confound human communication, there is the synchronization of varying time zone differences that collapse within meetings that are composed of participants from different regions. I myself have been involved in many Zoom meetings where participants are joining the meeting from very different time zones, climates, and even days of the week. Zoom is nothing short of time travel and it creates a space that is literally without time, which again can be taxing on participants whose participation may fit outside of normal working hours. This may draw parallels with the anytime anywhere rhetoric of online and distance learning that poses these opportunities as advantageous to learners that need more flexibility, but this only rings true in asynchronous forms of online exchange. Zoom, a synchronous technology, demands real-time participation, and if your learning community extends across the globe this can prove very challenging to find the right time to meet.

Zoom also creates spatial metaphors that craft unique exchanges through virtual-embodied learning. The grid format that arranges the video feeds from different participants creates embodied relationships between users that can be disorienting as soon as you realize that everyone's screens are casting the grid assortment in unique ways to their device. Breakout rooms section off spaces within the communication exchange, often through an immediate switch from one room to another, without transition, that can be quite jarring. Other videoconferencing platforms have played with these rigid grid formations to present more naturalistic settings. Consider Microsoft's Together Mode in its Teams platform, which presents video feeds in a sort of lecture hall setting, ditching the grid, but essentially reinscribing a teacher-led lecture space right down to the assigned seating. Even though this environment attempts to situate the body in a more human setting, lighting cues from the silhouettes produce giveaways that everyone is somewhere else while simultaneously right here, adding to the disorientation that is so central to Zoom communication.

Zoom as Performance in Cinema and Terror

In the massive adoption of videoconferencing that occurred for many educators in the spring of 2020, I personally recall many conversations with my colleagues concerning the production value of our classes. Whereas previously, instructional sessions may have been engineered through activity segments that vary group and individual dynamics or carefully balance modes of teacher-led and student-led modalities, these new conversations tended to focus more on audio quality, lighting, and high-definition video feeds. Teaching has always been a production—in many ways, this is the essence of the instructional designer in making choices about what resources to bring into the learning space to provoke engagement and exchange—but never before has there been such a widespread emphasis on the production value of screen-based learning. In an era of social media and influencers, it appears that the teacher’s ability to create content is vital in breaking through to students’ lives.

And some were naturals at it. Assistant professor Ryan Ball, from the University of Michigan’s Ross School of Business, went viral after a student posted his unconventional lecture that opened with his face masked as a stock image of a potato with an arena-like jam of the tune “Let’s Get Ready To Rumble” playing. The spectacle was captured by student Amelia Charamand-Quelas and posted to the social media platform TikTok to eventually garner nineteen million views (Fowler, 2021). While Ball’s efforts appear to be more of an instance of letting loose to create a more fun atmosphere, others have taken the cinematic production of learning on Zoom to its extreme. Dr. Daniel Russell, an acoustics professor at Penn State, has created a treasure trove of parodied movie settings to entertain his Zoom classes. Using a complex array of Zoom virtual backgrounds and costumes, Russell has staged class lectures as Batman, Indiana Jones, Princess Leia, and Gandalf from the *Lord of the Rings* (Agarwal, 2020). These performing professors are taking the discourse of edutainment to the extreme within the era of Zoom, but they highlight a confluence of media landscapes that have slowly mutated students’ lives as well. Just as the role of broadcast media and pop culture forced teachers to grapple with a new era of engagement in twentieth-century media, now, in the twenty-first century, we are awash in social media streams, influencer content, and screen bits that fill up our day and fracture our attention or our ability to be attentive. While we should not see attention spans as a set universal that has declined in direct relationship to the rise of social and

mobile media—the effects are not that causal or that clear—there are effects to our attention as it is molded within the current media scape (Subramanian, 2018), and this will impact students' ability to participate in online learning. It appears that a part of combating a lack of attention may require that Zoom instructors take on more and more of the characteristics of the media-saturated environments that surround them and produce learning experiences like social media events.

Of course, all media events do not always have altruistic aims, and Zoom offers openings for these more nefarious objectives as well. It is important to emphasize Zoom's temporal arrangement in this regard: it is more like a live televisual experience than a cinematic one because participants gather within the synchronization of screens within a real-time event. While this may add to the emergent and comedic impact of such improvised stunts as Ball's dancing potato selfie, it can also be the ingredient to online forms of abuse and terror. Often referred to as Zoom bombing, forms of interventionist public performance in videoconferencing have introduced hate speech into the Zoom room by hijacking events through intrusions that often stage acts of violence, post sexually explicit content, or utilize forms of hate speech that promotes racism, antisemitism, and misogyny. Zoom bombing trolls collect in dark corners of the web, hosting servers and message boards that broadcast Zoom meeting information that has been gathered using various bots combing the internet and social media. The events that they attack vary widely from Alcoholics Anonymous meetings to commemorations at the Israeli Holocaust memorial (Meinech & Schwenn, 2020). University and school spaces are no exception, with a wide range of targets that involve even young children. My own university campus was assaulted in February 2021 when a meeting sponsored by the Gender Equity Center at Penn State, showcasing Black women activists against sexual violence, was taken over by a man dressed as former Minneapolis police officer Derek Chauvin, who reenacted the killing of George Floyd (Blackburne, 2021). It is clear that Zoom can create particular aesthetic events that in some sense capture audiences, either through technological and augmented narrative or through a kind of terror, and it is vital that these aesthetic events and the access and safety of participants be carefully considered.

ZOOM AND ALGORITHMIC BIAS

In September 2020, PhD student Colin Madland tweeted about an experience he was having with a Black faculty member in his Zoom events (Dickey, 2020). According to Madland (2020), whenever said faculty member would use a virtual background, Zoom would remove his head and instead find “a nice pale globe in the background [which] must be a better face.” When Madland tweeted to relay the case of algorithmic bias in Zoom, the Twitter algorithm for cropping pictures cut out the Black professor from the preview, compounding the erasure yet again. While this may seem like an isolated incident or series of random events, the fact is that algorithms have displayed bias throughout the history of computer science, a notoriously white- and male-dominated profession. From Google’s artificial intelligence (AI) labeling photos of Black people as gorillas (Hern, 2018) to Microsoft’s AI chatbot Tay being taken down within hours after its auto-generated tweets degenerated into antisemitic, racist, and misogynist messages (Paul, 2016), these events all point to the bigger issue of the prevalence of bad algorithms. These bad algorithms come at a tremendous real cost that goes far beyond a glitch in a Zoom meeting room. The United States National Institute of Standards and Technology (NIST) and Department of Homeland Security have both reported that darker skin challenges commercial facial recognition software, and NIST’s testing notes that Black women give the highest rates of false match rates (Simonite, 2019). These software systems are big business in national security systems, and their rapid adoption, despite these alarming inaccuracies, have raised concerns about the unfair treatment of people of color and women.

Despite recognizing the bias in algorithms, the issue is so systemic that it is difficult to anticipate or treat. The Brookings Institute, a prominent think tank in the United States, has set forward procedures for best practices as private and public sectors are increasingly turning to AI systems and machine-learning algorithms to automate simple and complex decision-making processes (Turner Lee et al., 2019). While these regulatory efforts are ongoing, the problem is deeply entrenched in the process in that machine-learning routines that produce bias in algorithms are using biased data sets (Buolamwini & Gebru, 2018), and creating a robust regulatory environment that can accurately audit these data sets proves very challenging with persistent ethical concerns (Raji et al., 2020). For

the Zoom classroom, there is little choice but to vigilantly avoid these entrapments: an all but impossible task.

CONCLUSION

In the above assemblage of Zoom, I reviewed three areas of translation pertinent to understanding the videoconferencing platform as an active designer in the curriculum and instruction of learning spaces. Zoom disrupts human communication pathways, layering in glitches in the form of delays and limiting body language that can frustrate and fatigue users. Educators must take into consideration these added stressors and make informed decisions about screen time and students' digital well-being. Zoom creates a cinematic environment that can augment reality and provide unique opportunities in storytelling and for bad actors to terrorize captive audience. Educators need to maintain a heightened sense of both students' characteristics of engagement within the edutainment spaces and create mechanisms to ensure safe spaces of exchange in videoconferencing sessions. Zoom functionality echoes the algorithmic bias that is a part of a much broader trend in facial recognition software, where people of color and women are treated differently. Educators must involve students in understanding the ubiquity of these impacts of algorithmic bias, as they are impossible to avoid, and silence is another form of denial. These eruptions in translation allow us to reflect on the instances of Zoom as posthuman pedagogy actively contributing to the learning space and to make ethical choices about our role within that collaboration.

We are in a unique time of confluence. Globalization is a trend that has various effects on our conceptions of the local, but software systems present unique instances of this phenomenon. When fast-food chains spread around the world, they often display slight mutations in menu items that are uniquely local. Software presents a different challenge for understanding what those instances of mutation may be, and as media arts educators we are compelled to grapple, along with our students, with these insights as to the nature of algorithms within our everyday lives.

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PART II

Reframing Global Media Arts:
Theorizing Innovation in New Media



Digital Making, Digital Breaking: Technological Dysfunction and a Postdigital Art Education

Robert W. Sweeny

Failure is an inevitable outgrowth of technological systems, whether they be communicational, educational, biological, or artistic. All complex systems incorporate some level of dysfunctionality. Dysfunctionality can be seen in complex systems such as linguistic forms of communication (Shannon & Weaver, 1964), human psychological states (Glover, 2014), and digital interactions (Baran, 1964). In this chapter, I will explore the relationship between digital art and postdigital art in art educational practices in higher educational settings. In the process, I will pay particular attention to the theoretical framing of the digital in art educational research and how notions of the postdigital potentially shift aspects of this research. I will propose that attending to the dysfunctional aspects of digital technologies can provide art educational researchers with a globally

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oriented theoretical framework through which the digital/postdigital dyad can be better understood and approached.¹

DYSFUNCTION

There are many ways to think about dysfunction as it relates to art. Each aspect of the creative process can be impacted by the influence of physical degradation and conceptual miscommunication, to name only a few examples. As I have written at length on this topic as it relates to digital art in *Dysfunction and Decentralization in New Media Art and Education* (Sweeny, 2015), I will speak more specifically about the concept here as it relates to the postdigital. It is, in fact, within theories of the postdigital that dysfunction itself is problematized, in a generative manner. As I have argued, dysfunction in new media artistic practices can be thought of through three concepts: overload, failure, and noise (Sweeny, 2015). Each type of dysfunction points out flaws in the technological networks that are being used. These flaws are important to consider, as digital technologies are often described and promoted as being more efficient than previous technologies.

When looking at the relationship between art and dysfunction, it is instructive to look to the work of French philosophers Deleuze and Guattari (1987), who propose that art is a desiring-machine that operates only as it breaks down. This concept is drawn from the psychoanalytic practices of Guattari, who theorized as to the machinic aspects of subjectivity and identity formation from a post-Freudian perspective. While Deleuze and Guattari were not specifically referring to digital works of art, these ideas bring much to bear when one considers new media works of art and dysfunction, as I have argued. Furthermore, Deleuze (1992) speaks to the influence of networked digital technologies in an essay titled, “Postscripts on the Societies of Control.”

In this essay, Deleuze builds upon the work of the French historiographer Michel Foucault (1975), who spoke to the parameters of disciplinary societies and the control that they exert over the individual in *Surveiller et Punir: Naissance de la Prison* (*Discipline and Punish: The Birth of the Prison*). For Deleuze (1992), the enclosures that Foucault analyzes are in a state of upheaval, particularly after World War II:

¹To these ends, I will identify the nationality of all artists and theorists who are discussed in detail.

We are in a generalized crisis in relation to all the environments of enclosure—prison, hospital, factory, school, family. The family is an “interior,” in crisis like all other interiors—scholarly, professional, etc. The administrations in charge never cease announcing supposedly necessary reforms: to reform schools, to reform industries, hospitals, the armed forces, prisons. But everyone knows that these institutions are finished, whatever the length of their expiration periods. It’s only a matter of administering their last rites and of keeping people employed until the installation of the new forces knocking at the door. (pp. 3–4)

Here we can see the influence of the previous description of the desiring-machine. Just as the desiring-machine is in a constant state of breakdown, so are the social groupings that make up the societies of control. The societies of control exert power over its subjects not through distinct hierarchical systems, but through continual modulation that takes the form of passcodes. This modulation shifts the traditional relationship between the individual and the mass, and creates what Deleuze (1992) calls the *dividual*:

In the societies of control, on the other hand, what is important is no longer either a signature or a number, but a code: the code is a password, while on the other hand the disciplinary societies are regulated by watchwords (as much from the point of view of integration as from that of resistance). The numerical language of control is made of codes that mark access to information, or reject it. We no longer find ourselves dealing with the mass/individual pair. Individuals have become “dividuals,” and masses, samples, data, markets, or “banks.” (p. 5)

In the dividual, we can see that subjectivity, the concept that is perhaps most central to modernism, is broken down through institutional applications of networked digital technologies. Dysfunctionality here is framed as a negation, as a lack, but in the desiring-machine that continually breaks down, there is a model for thinking differently about the self.

It is between these two concepts of dysfunction that art educators might find opportunities to rethink the use of digital technologies in the spaces of art educational practice. In order to explore these opportunities, I will now turn to a discussion of postdigital art. It is in postdigital art that art educators might find relevant examples for such rethinking.

POSTDIGITAL ART

... when speaking of the notion of the post-digital today, it is not for me a term that denotes the end of the digital, but rather a term that describes how a certain historic mobilization of the digital both as ideal and material has become subsumed in larger socioeconomic and global development schemes, where everything, to some extent, is already digital (and even analog entities are bound up with digital information flows). (Gansing, 2017, p. 30)

The concept of the postdigital has been discussed in new media art circles since the early part of the twenty-first century. The postdigital is closely tied to related sociocultural configurations, including but not limited to the posthuman (Hayles, 2001) and postmodernity. Each of these epistemological structures can be seen as relating to a temporal state: the postdigital references that which comes after the digital. But what does this mean when digital technologies still exist? Not only do they exist, but they continue to extend their influence over the daily lives of increasing numbers of global populations.

As Geoff Cox (2014) suggests, the postdigital can and should be read through its relationship to the modernist/postmodernist dyad. It follows that, when approached as theoretical frameworks, the digital and the postdigital can be seen as existing simultaneously, just as theorists such as Jameson have theorized the coexistence of modernism and postmodernism (Schulenberg, 2001). Within these epistemological frameworks, there are certainly points of contrast and contradiction, and while some may choose to see an end to modernism in the postmodern, it would be fascinating to consider what the end of the digital would mean in our current era. Such speculations are unfortunately beyond the scope of this chapter. However, I argue that it is relevant to maintain a level of uncertainty when attempting to define the postdigital, as this uncertainty can allow those involved in the discussion space to think about alternatives that are outside of a totalizing binary framework.

It is within this fluid relationship between the digital and the postdigital that art educational researchers might find a theoretical framework through which digital artistic processes and products can be better analyzed, understood, and taught. Theories of postdigital artistic production originated from the field of electronic music (Cramer, 2014). US musician and theorist Kim Cascone (2000) was one of the first to use the phrase, writing about the postdigital in reference to electronic musicians who

incorporate a variety of glitches in order to expand beyond the smooth spaces of digital sound productions. Florian Cramer (2014) identifies a particular paradox in these initial descriptions of the postdigital:

There is a peculiar overlap between on one hand a post-digital rejection of digital high tech, and on the other hand a post-digital rejection of digital low quality. Consider for example the persisting argument that vinyl LPs sound better than CDs (let alone MP3s)... In fact, the glitch aesthetics advocated by Cascone as “post-digital” are precisely the same kind of digital trash dismissed by “post-digital” vinyl listeners. (p. 15)

Here we can identify simultaneous temporal and atemporal readings of the postdigital in electronic music. Postdigital music used digital technologies to frustrate the narratives that digital technologies provided a superior, and perhaps perfect, listening experience. In that regard, they coexist. In the sense of the postdigital vinyl enthusiast, the postdigital is actually a return to an earlier, analog experience that is considered to be more “natural.” In this regard, the postdigital is a retrograde movement that returns to an earlier era.

If this is the case with electronic music, can we identify similar paradoxical situations within digital art? If postdigital art both frustrates the emphasis on perfection in digital media and represents a return to earlier techniques and themes, then might art educators be able to leverage these points of contrast to open up space for relevant conversations to be had? For these pressing questions to be explored, specific postdigital works should be discussed. Postdigital visual art might allow art educators to explore the generative possibilities inherent in digital making, as well as digital breaking.

DIGITAL MAKING, DIGITAL BREAKING

As identified in the previous section, postdigital art can be represented by digital art that challenges its own digital qualities, and it can also be represented by art that marks a return to earlier, predigital themes and techniques. First, I will discuss works that attempt to undermine the smooth surfaces and error-free operations of digital media, which can be demonstrated through the example of the glitch.

Glitch Art

Digital art makes use of a variety of technologies, both advanced and outdated, high-tech and low-tech, to speak to a host of contemporary issues and themes. Digital art also represents a form of visuality that has the capability to isolate and highlight the limits of technological progress, while pointing toward new and novel applications for digital technologies. As I have previously argued (Sweeny, 2020), new media art has the ability to leverage dysfunctionality as representation in ways that other disciplines cannot. In this section, I will focus on the concept of the glitch as an artistic tactic that opens up space for critical reflection and responses that relate to the postdigital.

A glitch is, simply put, an error in the normal functioning of a technical process or mechanism. Quite a number of theorists have taken up the concept of the glitch as digital technologies have assumed influence throughout many fields of thought. There have been discussions of the glitch in sociology (Berlant, 2016), in contemporary music (Prior, 2008), and with regards to racism in digital spaces (Nakamura, 2013). There have been calls for “glitch studies” (Menkman, 2011), and texts written specifically on “glitch art” (Betancourt, 2016; Mattos, 2015).

One of the best-known works of digital art that makes use of a technical glitch is American artist Cory Arcangel’s *Super Mario Clouds* (2002). In this work, Arcangel modified the original Nintendo *Super Mario Brothers* game cartridge so that when the game was started, it only displayed the iconic clouds, scrolling by as in the full game. This is an example of a glitch that is intentional; these types of hacks are related to DIY groups that repurpose outdated technologies such as video-game consoles and children’s toys, creating something new from something old.

An example of an artist who explores unintentional glitches is the Dutch artist Rosa Menkman (n.d.):

My work focuses on noise artifacts that result from accidents in both analogue and digital media (such as glitch and encoding and feedback artifacts). I think the resulting artifacts of these accidents can facilitate an important insight into the otherwise obscure alchemy of standardization via resolutions.

The standardization of resolutions is a process that generally imposes efficiency, order and functionality on our technologies. It does not just involve the creation of protocols and solutions, but also entails the obfuscation of compromises and the black-boxing of alternative possibili-

ties, which are as a result in danger of staying forever unseen or even forgotten.

Through this research, which is both practice based and theoretical, I try to uncover these anti-utopic, lost and unseen or simply “too good to be implemented” resolutions—to find new ways to understand, use and perceive through and with our technologies.

Menkman has used these accidents to develop an approach to studying digital media which is known as “resolution studies.” In *Beyond Resolution*, Menkman (2020) collects and expands upon many of her artistic works, developing a theory based on the concept of resolution. For Menkman, much can be gleaned from the ways in which our digital technologies frame our relationship with the world. It is through the glitches that are produced when one attempts to reproduce an object in virtual reality (VR), for example, that the limits of such reproduction are visualized.

In the second category of postdigital art are those works that represent a return to a predigital history. They are, as described earlier, similar to those music enthusiasts who are convinced that vinyl records simply sound better than more common digital formats such as compact discs and MP3 files. While there are many artists who speak to such points of view, I will focus on artists whose works are described by the term post-internet.

Post-Internet Art

The approaches used by artists who are considered post-internet artists are varied. This is not unique to artmaking, as artists have always borrowed from a variety of influences, and often combine media in a variety of ways. What makes post-internet artists unique is that the internet is treated as a medium. As Ceci Moss (2015) states: “Under the designation postinternet or internet aware, internet art was not required to be online, but rather referred to art enmeshed within an informational culture, online and off” (p. 155). In this enmeshment, the internet is not used as the principal medium—it is a medium that can be combined with any number of other media, traditional or not.

In this way of working, digital media is brought into the traditions of appropriation and montage that have been in operation throughout twentieth-century Western art, and specifically in avant-garde movements such as Dada. It becomes very challenging to describe the material aspects of post-internet work, especially when the references are numerous and

wide-ranging. This is also an important aspect of post-internet work: the access to previously unavailable information that the internet has provided has resulted in artistic practices that are expansive and, in some cases, unbounded.

Jennifer Chan is a Canadian artist, writer, and curator who engages with and employs post-internet artistic practices. Beginning in 2011, she worked primarily in digital video-based works including GIFs and YouTube videos. These works addressed “gender and race politics in reaction to the media’s promise of happiness” (Jennifer Chan, n.d.). In these video pieces, a wide variety of techniques and styles are combined in ways that are often jarring, and that reference an unskilled approach to video editing. Of these video works, Chan states, “Bad videomaking seemed sincere, effortless and convenient for the net. My older videos were inspired by fan culture on YouTube and could be lumped in with screen-recorded videos, unboxings, and reviews made by young videogamers” (as cited in Hirsch, 2014).

Her later work has combined digital video and interactive media with objects in installation-based works. For example, the work *Ally (Nice White Person)* (2018), which was featured in *Dude, Where's My Phallus?* curated by Kate Benedict at Bunker 2, Toronto, is composed of a Moomin stuffed toy sitting on an IKEA stool, its back facing the viewer as they enter the space. The work has been altered as such: the plush toy wears a bracelet with a miniature cell phone dangling from the bracelet. Across the back of the toy reads RESPECT, embroidered in varsity font. Embroidered on the front chest of the Moomin is a white ribbon.

To begin to analyze this work is to enter into a post-internet mode of art criticism. The Moomin characters were created by Finnish author Tove Jansson in 1939. Since the publication of the nine original Moomin children’s books, they have become a worldwide phenomenon (Shilling, 2017). The Moomin character is wearing a bracelet that reads “GOOD CSS.” This is a reference to computer coding practices. CSS, which stands for Cascading Style Sheets, “describes how HTML elements are to be displayed on screen, paper, or in other media” (W3Schools, n.d.). The field of computer coding is dominated by white men, a reference to which can be seen in the title of the piece. A further reference is the white ribbon embroidered on the chest of the Moomin. The ribbon is, most likely, a reference to the White Ribbon Campaign, which was started in 1991 in London, Ontario, as a response to male violence against women.

In these alterations, Chan loads the popular children’s cartoon character with numerous references to popular culture, including those from

digital technology use. In this manner, she is continuing her digital-video strategies of juxtaposition, but in a different medium. This type of approach is what makes her work representative of a post-internet approach to art-making, which should be considered a subset of the concept of the post-digital that has been previously outlined. The main difference is that post-internet work makes specific references and has a direct relationship to the internet, while postdigital art can be seen as more general in scope. Chan's work might be made of code, or it might be made of a modified store-bought plush toy. Regardless of the medium used, one can see similar strategies of appropriation and juxtaposition in her work. This is work that speaks to a cultural moment where networked digital technologies are ubiquitous, to the point where it does not seem that absurd that a plush toy would be wearing a charm bracelet that features a tiny cell phone.

The internet creates a flattening of previous cultural hierarchies and has also increased access to the means of production. Poorly made YouTube videos exist alongside professionally produced works. In works such as *Ally (Nice White Person)*, references to computer coding, cartoon characters, and violence against women are all brought into the same rhizomatic set of connections.

POSTDIGITAL ART EDUCATION

Now that I have analyzed specific works of postdigital art, I will conclude this chapter with a discussion of the implications for such practices in the field of art education. The use of the glitch by Arcangel and Menkman represents moments where digital technologies fail in ways that can be both frustrating as well as illuminating. In recent art education scholarship, Courtne Wolfgang et al. (2017) have argued for the glitch as an artistic form of feminist critique in the popular visual culture of girls. They describe the possibilities for creating glitches with art students that allow them to create potent forms of visibility and enter into discussions of gender, class, and race, influenced by the work of American new media artist Legacy Russell. As I have argued (Sweeny, 2020), the glitch as an element of postdigital art should be understood as an artistic tactic that is intentional, designed to test the limitations of a given system in ways that are not common within scientific, sociological, and/or technological disciplines.

This is the first aspect of postdigital art that should be addressed by art educators who use digital media. Postdigital work should be seen as

containing both critical and celebratory gestures. Often, when digital technologies are used in the visual arts classroom, they are presented as a medium that is ubiquitous in fields such as graphic design, product design, and marketing. It is this ubiquity that provides a rationale for the creation of digital illustrations, for example. But what of illustrations that critique the smooth surfaces of Adobe Photoshop and Illustrator? What about digital images that undermine their digital-ness? This is a paradoxical situation that could generate much dialogue in the public-school art classroom, for example. In the process, the conversations could lead to questions regarding funding for computers in schools, licensing fees that tend to be exorbitant, and the training of the teachers who use these technologies, to name but a few. The postdigital opens up spaces for self-reflexive conversations to be held, and for art to be made that both critiques and celebrates the digital.

The post-internet practices of Jennifer Chan identify a different set of concerns related to digital technologies and artistic production. Whereas the works by Arcangel and Menkman discussed here were primarily digital and intended to be viewed through a digital platform, Chan uses installation-based strategies to speak to issues that are relevant to digital technology use. Finnish art educator Tomi Dufva (2018) has explored possibilities for post-internet practices through research on coding with young people as well as makerspace-based practices.

In Dufva's work, the influence of digital technologies is placed within a larger framework of traditional media explorations, craft-based processes, and coding strategies and applications. Most importantly, Dufva's work is primarily with young learners. This is significant because the emphasis in much of the scholarship on digital media in art educational practice tends to favor older learners. The opportunities for learning through postdigital approaches do not necessitate an emphasis upon learners who are of a specific age.

This is the second point that should be emphasized when considering the potential impact of postdigital approaches on art educational practices. Most of the digital technologies that are used in the spaces of public schooling tend to require skill sets that younger learners might not have developed. These skill sets might be physical, in the case of fine motor skills or hand-eye coordination. They might also be cognitive, in the case of the higher-order thinking skills required in most coding applications. However, programs such as ScratchJr have enabled very young learners to participate in coding activities and rudimentary programming exercises.

These prerequisites are not necessary for engaging with postdigital approaches to making art. To create a glitch, one does not need to know much in the way of coding or programming. One simply needs to know how to push an image or a process to the point where it breaks. Certainly, many young learners know this strategy very well. In terms of post-internet art, many young people would relate to the use of the internet as one medium among many. Young people are generally very familiar with the internet and its related cultural formations such as memes and mashups.

The last point that I would like to make relates to a quotation from Australian art educators Judith Wilks et al. (2012):

Another common barrier appears to be equipment failure that is not attended to in a time-efficient manner. This has myriad implications for classroom management and curriculum planning. If the tools do not work or do not work efficiently, then they will be discarded for tools that are more reliable and less likely to fail. Art teachers who are discouraged by technological failure will turn back to their tried and true methods. (p. 61)

The authors are describing digital technologies as tools, which is not uncommon in the literature on digital media in art educational settings. However, the implication here is that the technologies are used by the artist to make the finished work. The technology is not the finished product, just as the tools used to craft the clay vessel or monoprint are not the work itself.

Wilks et al. (2012) identify four challenges that public-school art educators face when attempting to incorporate digital technologies: relevance and benefits; time and the crowded curriculum; resources and professional and technical support; and access and restrictions. Each of these frames the use of digital technology in a similar manner. Sometimes the technologies are described as tools that are used to make art, but more often than not they are tools that the teacher uses to teach. This is an important distinction to make, as dysfunction is a function of all digital technologies, regardless of use or intent. As such, art educators have the opportunity to make use of these various forms of dysfunction, whether they are dealing with a glitch in Photoshop, or an unstable video feed in a Zoom classroom.

In this way, the postdigital incorporates a level of dysfunction that has not been addressed by previous ways of using digital media in genres such as new media art. In new media art, dysfunction stands out in relationship to an ordered, well-functioning process or program. In postdigital art,

such assumptions are not made. The postdigital work of art might require that a particular program or process function in a specific manner, but they just as often assume that these programs will fail. The glitch work of Cory Arcangel and Rosa Menkman may function according to the intent of the artists, but this is not required for the piece to be successful. In fact, if the piece fails—if the Mario Clouds do not scroll across the screen, or if the glitch portrait is appropriated and reproduced as a piece of clothing—it is still operating within the boundaries established by the artists or, better yet, through the acknowledgment that the artist sets the initial boundaries, which are then augmented by the processes of the program or the marketplace.

Postdigital art raises these issues in ways that are unique to this genre. The simultaneous critique and celebration, the applicability to a wide variety of age groups, and a dysfunction that illuminates our dependence upon these technologies are what postdigital works of art offer for art educators who are engaged with digital media. The impulse to “turn back to tried and true methods,” as Wilks et al. (2012, p. 61) state, should be met by skepticism by art educators who are invested in exploring digital making as well as digital breaking.

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Emerging Technologies in Art Education: What If I Don't Want To?

Richard Jochum

There is widespread agreement that technologies are a vital part of today's art education, its teachers, and its students (Carpenter II. & Cifuentes, 2011; Delacruz et al., 2014; Dilger & Roland, 1993; Hsu & Lai, 2013; Jochum, 2017; Keifer-Boyd, 2005; Roland, 2010; Taylor & Carpenter II., 2002). Yet there is also widespread resistance—when faced with the realities of incorporating rapidly changing technologies into art education, the students, teachers, administrators, and even schools often display a reluctance that does not match their theoretical enthusiasm for technology-infused curricula (Black & Browning, 2011; D'Angelo, 1988; Delacruz, 2004; Heise & Grandgenett, 1996)

There are good reasons for this resistance. Many public schools in the United States cannot easily afford the expensive equipment or specialized staff necessary to provide up-to-date makerspaces that offer students access to newly emerging technologies. Administrators, even if eager and able to invest in makerspaces and the attendant digital fabrication tools,

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must rely on teachers who know what to do with them. Art education students and art teachers may be willing to try out new media yet lack the time and opportunity to educate themselves about the ever-evolving technologies being used in today's art practice, leading to lack of confidence and diminished enthusiasm for teaching their own students about them.

All of this resistance is understandable, but it is not inevitable. This chapter suggests four avenues for overcoming it, which derive from the way an old "new" technology, video blogging (vlogging), was taught years ago. I present an autoethnographic review of my journey into technology-infused art education from within a graduate program and use that reflection to lay out my present-future philosophy about teaching art education technology to the next generation of teachers.

VLOGGING: AN OLD TECHNOLOGY THAT CAN HELP US FIND A NEW WAY

In spring 2005, vlogging was fairly new, and at the time there were barely a hundred video bloggers (vloggers)—people using video as the main ingredient of their blogs. That is when former television producers Ryanne Hodson, Michael Verdi, and Jay Dedman (Simmons, 2014) offered a free vlogging workshop at Flux Factory in Queens, New York. I attended, and for me it marked the beginning of a long interest in creative technology education.

That workshop, in many ways, was like the field itself: a small, enthusiastic community thrilled to learn a new technology with enormous potential. The instructors were vlogging evangelists. True educators, they not only taught the participants the how-tos of vlogging but also emphasized its remarkable usefulness and affordability for anyone with a computer, an internet connection, a digital camera, the willingness to learn an emerging technology, and a commitment to posting videos to a blog on a regular basis. The vlogging workshops explained, step by step, how to publish video on the World Wide Web. With standard-definition digital cameras becoming ubiquitous and free editing software readily available, there was no longer any need to book an expensively outfitted production studio to make a video for public viewing. Verdi and Hodson (2006) explain:

Because videoblogging shares a lot of the visual language of television and film, people often consider it just a new twist on old, established media. But videoblogging is profoundly different from its relatives.... unlike conventional television and film, it's a medium that is open to anyone with a few relatively simple, affordable tools. (p. 189)

For little if any compensation, the instructors gave me and countless others a new, accessible dimension of storytelling and artistic expression. They not only offered workshops but also raised funds and material donations to bring vlogging and digital cameras to remote parts of India, Africa, China, and the United States, among others (J. Dedman, personal communication, 2008) and translated their free tutorials into several languages. Their main goal was clearly education, not monetization, and they were part of a larger, grassroots movement of participatory media that was revolutionizing digital production and maker culture. Like its predecessors in community radio and public access television, the new vlogger community aspired to put media production in the hands of the public, democratizing access to both its creation and its consumption.

The particular strength of vlogging lay in its connection to social media and a networked participatory culture in which producers and consumers converge (Jenkins, 2008). “Partly because of the accessibility and quality of digital editing and also because of the ease with which such material can be distributed online,” vlogging lifted digital technology from the marginalization of previous amateur filmmakers (Buckingham & Willet, 2009, p. 42). Also, while older media were limited to single tasks—in the case of television and radio, one-way broadcasting—citizen media like vlogging allowed a much broader, back-and-forth social involvement.

Importantly, vlogging had an innately artistic quality. As with any art practice, style revealed itself through sheer repetition. The new aesthetic of video blogs (vlogs) discarded some longstanding production techniques, including the use of tripods. Vlogs in their nascent state had a different kind of look—shaky, revealing that they were filmed from a cradled hand. It was now cool to shoot from the hip, experiment, and find one’s own style. Thanks to the growing number of vlogs and their audiences, their aesthetics became part of the larger visual culture, even affecting the style of feature films as production studios no longer had a monopoly on the rules.

That community—of creators and consumers—was key. The technology offered by educators such as Verdi, Hodson, and Dedman worked self-sufficiently, was built on free software, and enabled affordable access by, among other things, using free hosting sites. Vloggers often promoted each other’s work by linking to it, referencing it, and commenting on it, demonstrating real respect for each other’s work. A spirit of enthusiastic comradery pervaded the vlogging universe. As Verdi used to say at the end of his vlogs (I’m paraphrasing), “Don’t send me a comment. Send me a video response instead and add a hashtag so we can all find it.”

This was all part of “Web 2.0.” Verdi and Hodson (2006) observed that “instead of being a one-way communication from creator to consumer, like traditional media (not just movies and TV, but newspapers and magazines as well), vlogging is about creating conversations among members of a global community” (p. 189).

The World Wide Web of the 1990s had been one-dimensional: producers simply provided content for users. But with Web 2.0, access expanded, and so did the definition of who could be a producer. As companies began creating platforms for users to produce content of their own, the web also changed. New business models focused on public participation, and user experience (UX) began to dominate software development. Peer-to-peer models changed how we store knowledge (Wikipedia), travel (Tripadvisor), socialize (Facebook), access news (Twitter), shop (Amazon), search (Google), share (tags), credit (Creative Commons), and approve or dislike (user reviews).

This changed the way we taught new and emerging technologies, too. As online resources became widely available, step-by-step classroom instruction was no longer as important. This shift has long been recognized, as Don Krug (2002) noted twenty years ago:

New digital technologies are fast replacing analog forms of broadcast media (slides, video, overheads). Teachers and students are experiencing a shift from learning focused on instruction delivered by subject-area experts to interactive pedagogy that facilitates a self-directed and collaborative learning environment. (p. 36)

Likewise, learning has changed. Students learn not only from their teachers but from each other and from the technologies themselves. With electronic media and technoculture reshaping our notion of literacy and what students need to learn (Buckingham, 2007), media interfaces are designed to be instructive. Students today are used to wayfinding software by intuitively tapping their screens until a particular app reveals its next step. But this is as much a matter of learning from each other and those who came before, as it is of companies paying attention to UX. “Digital technologies have transformed how and what young people create” (Pepler, 2013) and, by extension, how they learn: in collaboration and learning cultures that are often informal. This has profound effects on the education of the art teacher. Technology-infused art education both requires and enables new literacies (Dilger & Roland, 1993).

TEACHING: THEN AND NOW

While I was excited from the beginning about the streamlined production, postproduction, and publishing skills I learned in the vlogging workshop, it took time for me to realize the potential those skills would have for my art practice. I had hired an expert editor to get my first arthouse video underway, but later built-in video editing software and blogging applications gave me unprecedented access with room to experiment and fail. Once the artistic and technical capabilities hit home for me—or, as Maxine Greene (2000) might have said, once my imagination was released—I was eager to bring this medium to other artists and art teachers. I soon began offering workshops myself and ultimately became a professor teaching about creative technologies more generally.

Looking back, I see a stark difference in the way I began teaching vlogging and the way I teach emerging technologies now. When I began offering workshops, the emphasis was on mechanics—I offered step-by-step guidance on topics such as how to select cameras; use software to capture, edit, and compress videos; establish blog sites, create a first post, and adjust settings; connect with media hosts and RSS software; and reach out to a community to bring the work to life. Dedman, Hodson, and Jordan provided very detailed instructions on a website¹ and through books filled with screenshots (Dedman et al., 2007; Verdi & Hodson, 2006), which my students and I found invaluable.

Over time, my teaching became more conceptual and part of a broader educational vision. I understood that to inspire future art teachers, new media needed to complement old media, not replace it—as some aspiring teachers feared it would. Art teachers, after all, often feel at home in traditional art materials. This is why I believe that new media can be best leveraged by combining new, digital materials, with old, more familiar materials. I also learned that to capture the students' interest, I needed to make room for peer learning. Instead of introducing each new medium entirely myself, I learned to give my students the opportunity to become digital stewards so they could explore, present, and activate the classroom on their own, often tapping into a youth culture that is steeped in new media practices.

The importance of collaboration can hardly be overstated. With generation after generation—and youth culture—being more immersed in

¹The website, which I helped translate into German, still exists: <http://www.freevlog.org>.

technology practices (and bringing with them deeper and more diverse backgrounds in media production, design, programming, digital fabrication, social media, etc.), instruction must change. Vlogging, social media, games, and chats are all part of a participatory culture that “shifts the focus of literacy from individual expression to community involvement. The new literacies almost all involve social skills developed through collaboration and networking” (Jenkins, 2009, p. xiii). I learned to pay attention to challenges such as how to give voice to youth culture through digital storytelling or how best to leverage collaboration in the production of vlogs, only to discover that these questions have importance for technology-infused art education—and art practice—writ large.

Art education students bring vastly different skills—in graphic design, social media, and more recently, in digital fabrication and coding. To cater to different levels of learners, I encourage students to see technology as a language, where a loss for words matters less than the ability to circumscribe; I have also learned to give them choices that leverage both their freedom to create and their ability to learn from each other. For example, rather than teaching students every detailed step for creating a blog, a short recap for students who are less advanced often suffices, in combination with student teamwork and collaboration. Technology-infused art education requires, especially at a graduate level, differentiated instruction, tailored to individual students’ needs; and while step-by-step guides might make little sense for advanced learners, they can have a place for beginners as well as in dealing with yet unknown, emerging technologies, which doubtlessly will take time to explore.

While some of these changes may be part of my own teaching journey, I believe they are also the result of overarching changes in technology-infused art education. Art teacher education has undergone so many technological changes in such a short time—“It seems technology is changing at a pace quicker than public schools can find effective ways to integrate it before it changes again” (Hess, 2014, p. 38)—that it has become necessary for educators to step back and think more critically about how to integrate technology in meaningful ways without getting lost in tech fads.

I DON’T WANT TO: RESISTANCE TO CURRICULAR INCORPORATION OF CREATIVE TECHNOLOGIES

Today’s art teachers have extraordinary resources at their fingertips, such as YouTube, Kadenze, Khan Academy, LinkedIn Learning, and image-based, next-generation search engines. But they also have extraordinary

responsibilities. They have to familiarize themselves with a dizzying number of creative technologies in addition to traditional media. For example, I have frequently taught a new media survey class focused on audio, video, computer, digital photography, digital painting and drawing, and other media. Since I began teaching the course in 2011, the number of technologies it covers has doubled to include, among other things, 3D printing; computer numerical control (CNC), laser, and vinyl cutting; creative coding; circuitry; augmented reality (AR); virtual reality (VR); and robotics.

Implementing these technologies in the classroom is also a challenge for teachers, who “must not only come to be users of a tool, but also to design usage of the tool by learners” (Laffey, 2004, p. 362). While the proliferation of technology has multiplied the possibilities of using technology creatively in the curriculum, teachers have to learn how to operate more complex tools and to understand the role of creative technologies in artmaking that is increasingly characterized by media convergence and hybridization. As the two art and design scholars Zhang and Funk (2021) note, “for creatives, the ‘difficult thing’ is the invention of meaning and purpose out of a large set of options, constraints, and relations” (p. 4).

Art teachers are expected to engage with prevailing concepts in education such as STEAM, equity and inclusion, and sustainability, and to distill them in a way that is useful, meaningful, and age appropriate for their own students and their learning ecologies, which may vary significantly. Moreover, the increased emphasis on interdisciplinary learning means they are expected not only to be on top of the rapid technology changes within their own field, but also to have the communicative power and competence to collaborate across disciplines.

At the same time, art teachers and art education students—like all of us—are operating in a highly monetized technology culture that has transformed many of the characteristics reflected in the vlogging workshop I attended in 2005. For example, when Google bought YouTube the year after for an expectation-shattering \$1.65 billion, putting video onto the web went mainstream, and the small, tightly knit community of vloggers became part of a niche and was later subsumed. Web hosting also became more expensive. The initial hosts—such as OurMedia, blip.tv, FeedBurner, and the Internet Archive—had been smaller, free, or focused on the public good but became progressively unsustainable.

Art education students today are taking their place in the art education world at a time of disillusionment with social media and certain other

forms of creative technologies, including computer vision (with its surveillance culture) and machine learning (and its use for deepfakes). With attention being increasingly paid to online abuses such as disinformation, cyberbullying, and harvesting of user data, questioning the value of such technologies has become more commonplace. Jonathan Rauch, in an interview by Peter Wehner (2021), puts the onus for a recent uptick in disinformation on polarization and technology:

We had a major information revolution in the form of internet, digital media, social media. And those turned out to be designed much better for propaganda and disinformation and “canceling” than they were for truth. They did not evaluate truth in transmitting information. They simply evaluated addictiveness, which means they prioritized outrage and enticing the false conspiracy theories over truth.

A similar critique is put forth by *New York Times* columnist Farhad Manjoo (2021) in his opinion piece on the negative effect of technology on global cooperation.

While the shift in the public sentiment has led to domestic debates about breaking up Big Tech to rein in abuses, education, too, has become reflective of a more critical mood. A recent visit to semester presentations at New York University’s Interactive Telecommunication Program shows how even students who have enrolled in expensive graduate education to become creative technologists are embracing media and technology critique. Their riposte seems to mirror the critical voices and recent whistleblowers within Big Tech themselves (e.g., Edward Snowden and Frances Haugen). A recent article by human-computer interaction researcher Susan Lechelt et al. (2020) is indicative of the mood swing among curriculum designers and instructors: it is not enough to bring principles of sensor technologies and computer science to students; they also, and perhaps more importantly, need to learn critical thinking skills. While this argument is not new, the urgency of a more critical mindset is undeniable, even among frontiers of today’s tech culture (e.g., Lanier, 2019). Concerns around the use of technology have become as pervasive as the technology itself, especially regarding the unquestioning tech dependency of Generation Z. Nonprofit founders Mokowitz-Sweet and Pelavin (2019), however, observe from their interactions with over 21,000 students from US elementary, middle, and high schools over the years that this generation of digital natives “are remarkably perceptive about the ways that

technology has changed their world and have a much more nuanced view than adults give them credit for.”

Finally, the remote learning necessitated by the COVID-19 pandemic has—almost overnight—changed the way art education is learned and taught. If at the beginning of the pandemic many educators seemed convinced that teaching studio art online was anathema to studio art learning, the cold hard fact of the global pandemic forced us to rethink our position. The emergency highlighted previously unanticipated benefits of technological advancements such as video conferencing software in conjunction with propped-up learning management systems. Many worried, however, of using such technologies due to their constraints and a mental health crisis in its taillight. The pandemic also provided harsh insight into how unevenly distributed access to the internet, digital imaging software, and computational hardware really is, and how deep the digital divide still runs. Far-distance learning has been around for some time, with ample scholarship that reflects powerful ideas. However, it is the pandemic that has made us aware of how little we understood online teaching.

Even after two years of pandemic teaching, it still strikes me how some of the models that scholars came up with to explain technology integration—such as the insightful Substitution, Augmentation, Modification, and Redefinition (SAMR) model by Ruben Puentedura (2006)—do not necessarily reflect the real-life experiences that people have made and continue to make. Technology is no panacea, not in the current moment nor in the past; instead, it generates problems of its own, including a split-screen type of teaching in which on-site students are paired up with online students who dial into courses remotely. We only start to take inventory of what has been lost when we move through the progressive stages of implementing large-scale online teaching, registering that an unexamined optimism for progressive technology integration can leave parts of our humanity aside. The education community’s laudable efforts to continue teaching during a public health emergency in good faith do not predict with any certainty what the return to a new normal might look like. Rather, this has been an example of an emerging technology that some were able to use haphazardly, others creatively, and others grudgingly.

Under the circumstances, it is no surprise that art education students are exhibiting resistance to the incorporation of creative technologies into their curricula. Resistance is not necessarily a question of familiarity. Even digital native students show ambivalence about the use of technology in art education (Jochum, 2017, p. 33). In her study on preservice teachers,

Sarah Southall (2012) finds their status as digital natives is of little advantage; on the contrary, they are nervous about using technology and, “while this group of preservice teachers has grown up in the digital age, their practice and, more importantly, their fundamental understanding of integrating technology into their instructional practices is limited” (p. 204).

Resistance can take on different forms, beginning with apathy based on a lack of interest or indifference (“I can’t take on one more thing”), passive resistance (“The limited hours of an art curriculum should be spent on drawing, painting, and traditional work”), active resistance (“Pupils already spend too much time on their screens”), or aggressive resistance (“Technology has no place in an art class”), and can escalate from the level of individuals to whole groups. Studies have shown (Lapointe & Rivard, 2005, p. 484) that if resistance is not addressed where it occurs, it can lead to permanent resistance or become politicized and managing it becomes more difficult. This is why it is important for art educators to address resistance early on.

Often, future art teachers are overwhelmed and fatigued by tech-infused curricula for understandable reasons. What can we do about this?

A PATH FORWARD

The early days of vlogging hold some valuable lessons for addressing the technology resistance of today’s art education students (and the teachers and administrators they become). Resistance is not just an attitude from students; it also reflects a more general resistance from within the field of art education, which makes it particularly difficult to tackle. Many programs or schools have enthusiasts in their midst who are happy to drive the field forward; yet, if technology integration is limited to a few tech-centric courses but not part of education more broadly, the ability of preservice teachers toward mastery will be limited (Laffey, 2004, p. 377). The following four aspects of the early vlogging experience could help rekindle enthusiasm for emerging technologies.

Community and Collaboration

The early vlogging community was, for the most part, small, respectful, and supportive, with participants actively promoting each other’s work. While the large number of users of any one present-day emerging technology is likely to preclude duplication of this with respect to that particular

technology, educators can replicate the community experience in the classroom. While countless experienced teachers already steer their classrooms to think collaboratively every day, creating this kind of classroom community requires intentional dedication and the willingness to give up control and embark on a pedagogy that is generative and interactive. Instructors should consider how they can provide a respectful space that fosters shared excitement about the topic being taught and reward students for supporting each other's work. Creative experimentation and collaborative advancement can easily flourish in that kind of public-minded environment.

Recent teaching during the pandemic further exemplified this lesson: successful adaptation of new technology is not a matter of good will on the part of teachers alone but also a learning experience that encompasses both students and teachers. While distance learning has been around for a long time, and so has writing about it, many teachers understand little of it in practice. When teachers were forced to teach online during the pandemic, most had to learn to teach in the new online format from scratch. Students were in a similar position: they didn't yet know how to learn online. By learning collaboratively, however, students and teachers together become a learning community. In order for technology to meet its promise, it needs a culture that accommodates all:

Our challenge is not to sell the promise of technology to already overworked art teachers. Enough teachers are capable and willing to engage new technologies, given the chance. Our challenge is to convincingly demonstrate how to engage new technologies in authentic ways that accommodate teachers' values, work conditions, time constraints, and school cultures. (Delacruz, 2004, p. 17)

The demand that teachers remain one step ahead, which has been the underlying principle of traditional curriculum design, has outlived itself in the face of technology in flux and a learning culture that is interdisciplinary. Interdisciplinary learning practices pose a big burden for teachers. "I will always be a dilettante" will be a difficult attitude to bear for a teacher who is supposed to take control of teaching, learning, pedagogy, students, curriculum, and school culture. Creating new models that are collaborative at heart relies on new approaches to teaching and to teacher education. While the underlying paradigm has been described before (Davidson, 2017; Thomas & Brown, 2011), a teacher-education culture and bureaucracy that emphasizes control over all aspects of the curriculum is, in my view, antithetical to collaboration.

Collaboration is central to teaching and learning in the face of emerging technologies. The trick will be to find the right circumstances for embedding technology in learning cultures.

Do-It-Yourself Learning

Thanks to the efforts of people like Verdi, Hodson, and Dedman, those interested in early vlogging were introduced to the skills they needed to weave videos into blogs through step-by-step instruction; the students then repeatedly put those skills into practice on their own blogs. That was empowering and effective. Without the benefits of the intuitive templates and adaptive software of today, early vloggers were forced to know code, experiment, and troubleshoot, either on their own or with the help of their peers.

While today's art education students generally need not learn the specifics of video compression, they can benefit from a similar do-it-yourself learning experience. Given the plethora of creative technologies relevant to art education as well as the many resources for learning discussed above, it would be unrealistic and unnecessary to attempt to provide this experience with respect to each and every such technology. Technology change is too pervasive for anybody to comfortably master all new technology, even in a subdomain. That does not, however, mean that educators ought to give up on do-it-yourself learning entirely. Rather, even in a survey course, they can choose to go in depth on one medium, providing both step-by-step instruction and the opportunity for students to put the skills they learn into practice. Understanding how a particular technology works and how to solve problems that may arise will teach students not only how to use that particular medium, but also that they have the ability to become fluent in other creative technologies that interest them. Lack of confidence in the ability to truly understand emerging technologies—to achieve mastery—can understandably lead to resisting them altogether; where students learn and practice the mechanics of a particular technology, however, they become empowered to repeat that experience in different contexts on their own.

Playfulness

Early vlogging was fun. Once early vloggers had gained the skills they needed to share videos on their blogs, they were eager to try them out. Thanks to inspiring teachers, a supportive community, shared enthusiasm

for the potential of a new technology, and their own creativity, early vloggers played around with their blogs only to discover their own visual language, themes, stories, and style.

Playfulness is important in teaching art education students any emerging technology. Playfulness supports motivation and releases our imagination. These students have chosen a creative field aimed at helping others enjoy the artmaking they themselves enjoy, so enjoyment is key. Students should learn in an environment that allows for experimentation, mistakes, and fun. Students are far more likely to resist technologies approached as by-the-book drudgery than those that allow them the opportunity to play. This applies even to seemingly prescribed processes like coding. A good example comes from Deren Guler, who invented the Bluebird, a microprocessor and visual programming language, to teach kids about the Internet of Things (IoT). Before diving into the visual programming language itself to operate the input/output rich microprocessor, she encourages students to work with “ideation cards.”² From a stack of cards, students choose a Mission that instructs them to connect a Thing that tells a Thing to operate an Action if a Sensor is Triggered. While students play with the cards, they playfully enter the IoT mindset. Once they understand the logic of programming through this playful, clever game, they understand the gist of programming.

Creative Resource Sharing

One of the great gifts of the vlogging workshop was the instructors’ free sharing of their expertise. There are analogous options for art education today. Lack of access can be a real obstacle to technology integration, but open-source graphic software like GIMP or Inkscape can substitute for some of the expensive corporate gateway applications on which art and design education frequently relies.

And while a high-end makerspace can be desirable within an innovation-based paradigm of education, it is expensive to maintain. Expensive machines need expert staffing. Safety protocols create their own hurdles. An alternative approach is to rely on a more flexible approach, such as using “art carts” and equipment sharing and making them accessible across classrooms, districts, or campuses. In addition to lowering expenses,

² See <https://www.teknikio.com/products/iot-ideation-cards-v1>

resource-sharing options in many instances are more environmentally sustainable as well.

This approach has the added benefit of expanding the classroom beyond its four walls. The sharing of resources encourages increased student agency and co-creation, providing opportunities for learning and collaboration that do not necessarily depend on the teacher.

Creative resource sharing can be particularly valuable for teachers working in public education, where access to resources is unevenly distributed. Sharing resources makes them available for free or at a low cost, thus allowing teachers to introduce new technologies in a way that does not break the bank and that models a culture of inclusion. This approach is particularly valuable because this is a field devoted to teaching art: it strengthens the creative muscles by teaching resourcefulness and the importance of partnership, bringing to life a vision of art practice that is participatory, community-based, and social.

CONCLUSION

The inclusion of ever-emerging technologies, online instruction, and interdisciplinary practices in art education, while vital to educators trying to stay up-to-date, has been met with both enthusiasm and resistance among art students, teachers, administrators, and schools. Preservice teachers, despite being millennials, surprisingly often do not see themselves as “digital natives” (Prensky, 2001), that is, raised with and fluent in digital media practices. Schools can’t easily afford expensive equipment or specialized staff for high-end makerspaces. Administrators, while eager to invest in makerspaces and digital fabrication tools, are reliant on teachers who know what to do with them in a curricular setting. Teachers, while willing to try out new things, are challenged to integrate and lack time to develop implementation. Art education professionals are struggling to keep up with a rapidly changing and ever-expanding field. And technology enthusiasts, caught up in their own devices or virtual environments, are often not helping. Neither is an internet culture that is either owned or exploited by corporations.

At a time when the United States puts its hope in STEM education—with some art and design educators expecting it to “solve the challenges the world faces today” (Norris, 2021)—the arts may “serve as a counterbalance to the infusion of new technology into our daily lives” (Dilger &

Roland, 1993, p. 3). But it's not that easy. With education being a public activity expected to follow a narrow set of expectations, teachers are scared of stepping outside their comfort zone. While the nation embraces technology integration and looks fondly at STEAM education as a means of teaching employable skills, teacher education continues to struggle. But teaching has always involved taking on changing learning landscapes, as recently illustrated by the pandemic. It is a question of balance, and some resistance may actually be quite useful for maintaining a balance in an environment that otherwise is quite enthusiastic about technology change.

Over time, my own enthusiasm for tech-infused art education has grown more tempered. This has much to do with our society's technology saturation as well as dismay over the perhaps overblown expectations and fears surrounding evolving technologies such as data mining and artificial intelligence. I am also disillusioned by the promises of a Big Tech driven by consumerism and colliding with sustainability efforts (Chapman, 2021). In hindsight, I realize that the sense of discovery I felt during the early days of vlogging has diminished. This may be because of the increasing enmeshment of internet culture and corporate culture, but it might also be the product of having taught technology for a long time.

And then there was the pandemic, which upended teaching and learning as we knew it. Despite the research that has existed about online learning and teaching, none of us really knew what it would be like when we as a society were thrust into online teaching based on emergency rather than planning. More than two years later, after an educational tech experiment larger than any school could have anticipated, we are transformed. With the pandemic, we had no choice. But usually, incorporation of technology into art education is a choice—and sometimes, schools, administrators, teachers, and art education students seem to choose “no.” In examining that resistance to creative technologies, as well as my own increasing resistance, I found unexpected inspiration in my own experience as an early vlogger.

Creative technologies will continue to evolve, and so will the question of how to teach them. But we already have some of the answers. The principles underlying the early days of teaching vlogging—community and collaboration, do-it-yourself learning, playfulness, and creative resource-sharing—are still valuable today.

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Digital Media and Art Education: The European Digital Competence Framework

Teresa Torres de Eça and Ângela Saldanha

Education is intended to “equip learners with agency and a sense of purpose, and the competencies they need, to shape their own lives and contribute to the lives of others,” as stated in an influential position paper of the Organisation for Economic Co-operation and Development (OECD, 2018, p. 2), which presents the first results of its project, “The Future of Education and Skills 2030.” The OECD (2018) also recognized that “education needs to aim to do more than prepare young people for the world of work; it needs to equip students with the skills they need to become active, responsible and engaged citizens” (p. 4). Great strides have been made by curricular authorities in each OECD member country to predict the knowledge, skills, attitudes, and values students need to

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thrive and to shape their world, but such efforts are always limited by the unpredictability of the future (OECD, 2018, p. 2).

Education stakeholders have embarked on this decade with a pressing agenda: at the top of the list is urgent action and adaptation to environmental change, climate change, and the depletion of natural resources. Second, economic and financial interdependence at local, national, and regional levels has led to global supply chains and economic crises. It appears that new economic, social, and institutional changes are needed to reduce the political instabilities and huge inequalities in life across the globe and in our own communities (United Nations, 2015). Third, scientific and technological innovations are raising numerous issues—for example, advances in biotechnology and artificial intelligence are challenging anthropocentric epistemology, and global communications are circulating data on a macroscale, raising issues of surveillance and control (Zuboff, 2019). Fourth, the nomadism and increasing social and cultural diversity of our societies—through migration, gentrification, urbanization, and virtualization—are reshaping human geography (Miller, 2018). Space and distance seem to be evolving into new configurations, and we need to be able to adapt to these new living conditions in a sustainable way.

Students are expected to actively engage in all dimensions of life and navigate through uncertainty, across a wide variety of contexts: in time (past, present, and future), in social space (family, community, region, nation, and world), and in digital space (websites, social channels, web games, entertainment and edutainment interactive platforms, distance education platforms, and other smartphone applications). The OECD (2018) position paper and the United Nations Educational, Scientific and Cultural Organization (UNESCO) publication, *Transforming the Future: Anticipation in the 21st Century*, edited by Riel Miller (2018), have announced new directions in education, promoting collaborative learning environments and learner agency. Agency implies a sense of responsibility to participate in the world and, in so doing, to influence people, events, and circumstances. But, despite all these macro recommendations, we are witnessing in the Western world huge cuts in the humanistic areas of education (Atkinson, 2018). The schools and curricula are not yet revising their curricular spaces to explore humanistic knowledge and plural literacies fundamental for fostering and engaging citizens in contemporary society.

Over the last few decades, the concepts of digital competence and digital literacy have been increasingly discussed in educational policy

documents. In Europe, we observed an increase of technology in all levels of education by offering more time and tools for the acquisition of digital competence in schools and in professional development programs. The Recommendation of the European Parliament and of the Council of 18 December 2006 acknowledged digital competence as one of the eight key competences for lifelong learning. In addition, in 2008 the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008) launched the information and communication technology (ICT) competency standards for teachers, with a focus on teacher education and digital literacy. In Portugal, the Ministry of Education launched a national strategy for more digital formats and training of teachers in 2010. With remote learning measures increasing in 2019 and 2020 as a result of the COVID-19 pandemic, these efforts have been significantly accelerated.

The European Framework for the Digital Competence of Educators (DigCompEdu) is a framework developed by European educational experts, defining what it means to be digitally competent. It provides a general reference frame to support the development of educator-specific digital competences in Europe and is directed toward educators at all levels of education in formal and nonformal learning contexts (Redecker, 2017). DigCompEdu recommendations were crucial for schools and teachers all over Europe to introduce more ICT content in their practices. Following the publication of the first version of the European Digital Competence Framework for Citizens, known as DigComp, in 2013, a second version called DigComp 2.0 was launched in June 2016, “updating the terminology and conceptual model, as well as showcasing examples of its implementation at the European, national and regional level” (Carretero et al., 2017, p. 6). The 2017 version, DigComp 2.1, “expand[s] the initial three proficiency levels to a more fine-grained eight level description,” with examples of use (Carretero et al., 2017, p. 6).

In the next section, we will describe the key components of DigComp and its influence on Portuguese education, in guidelines for curriculum development by the Ministry of Education and in school projects. We will introduce a practical example of the application of digital competence in art education: the international project Soundscapes. We will also provide other examples from research conducted with doctoral students in Portugal to raise the idea of agency of children and young people in the maker culture and illustrate how digital competence is approached in art educators’ teaching practices. This chapter concludes with a discussion of

digital competence in art education and the need to apply digital and media arts to foster critical thinking and civic participation.

DIGITAL LITERACY

The concept of digital literacy is related to cognitive abilities and social practices (Novakovich, 2016; Stordy, 2015). Allan Martin (2006) explains it as

the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process. (p. 155)

For Peter Stordy (2015), digital literacy is plural, including “abilities a person or social group draws upon when interacting with digital technologies to derive or produce meaning, and the social, learning and work-related practices that these abilities are applied to” (p. 472). Thus it is more about abilities to access, critically understand, use, transform, and create information through digital media in engagement with others. In education, digital literacy is often associated with the skills that enable multimodal discourses using digital technologies (e.g., the ability to communicate in an interconnected world via the internet using ICT). This includes a series of competences and skills to use digital devices to receive, understand, transform, and produce written, visual, and audio messages.

DIGITAL COMPETENCE

In a project started in 2010, the European Commission’s Science and Knowledge Service built DigComp (Carretero et al., 2017). **DigComp 2.0** and **DigComp 2.1** listed twenty-one competences and eight proficiency levels using the metaphor of “**learning to swim in the digital ocean**” (Carretero et al., 2017, p. 14). The framework has been used by the Portuguese Ministry of Education and the Spanish Ministry of Education, as well as other European countries, as a strategic support document for further professional development for teachers. As summarized on the European Commission’s (n.d.) EU Science Hub website, **DigComp 2.0**

identifies the key components of digital competences in five areas (Table 9.1).

We recognize that many steps and measures have been in place in many countries of the European Union to introduce digital literacy and digital competences in public education by, for example, releasing substantial documentation and frameworks to introduce digital skills in teaching and learning. In Portugal, we have observed an increasing interest in digital literacy in education and in art education. For example, about an extracurricular workshop named “Animation Forms,” teachers Sara Pereira et al. (2012) stated, “the learning process and the exercise of citizenship have changed profoundly due to the new digital environments” (p. 110). The teachers conducted a study between 2010 and 2012 in a Portuguese primary school with a group of eleven students, aged between 10 and 13 years, aiming to promote creativity, critical thinking, collaborative

Table 9.1 The DigComp conceptual reference model (European Commission, n.d.).

Information and data literacy	To articulate information needs, to locate and retrieve digital data, information, and content. To judge the relevance of the source and its content. To store, manage, and organize digital data, information, and content.
Communication and collaboration	To interact, communicate, and collaborate through digital technologies while being aware of cultural and generational diversity; to participate in society through public and private digital services and participatory citizenship; and to manage one’s digital identity and reputation.
Digital content creation	To create and edit digital content; to improve and integrate information and content into an existing body of knowledge while understanding how copyright and licenses are to be applied; and to know how to give understandable instructions for a computer system.
Safety	To protect devices, content, personal data, and privacy in digital environments; to protect physical and psychological health; to be aware of digital technologies for social well-being and social inclusion; and to be aware of the environmental impact of digital technologies and their use.
Problem solving	To identify needs and problems; to resolve conceptual problems and problem situations in digital environments; to use digital tools to innovate processes and products; and to keep up-to-date with the digital evolution.

learning, problem solving, decision-making, and expression of thoughts and feelings using multimedia arts on a digital platform (Pereira et al., 2012).

In Portugal, the curriculum is centralized by the state. The Directorate General of Education (2017) launched curricular guidelines for education based on humanistic values, defining student outcomes at the end of secondary school and identifying complementary and transversal areas related to all subjects for the development of multiple literacies and the use of ICT.

In the next section, we reflect on the contribution of media arts to digital competences, by introducing a 2012–2013 project called Soundscapes, which we carried out with several art educators and art education researchers (Delgado et al., 2015).

THE SOUNDSCAPES PROJECT

The Soundscapes project aimed to develop local intercultural actions in educational settings using soundscapes, a multimodal art concept using image and sound. The project, which extended from November 2012 to June 2014, involved five researchers, twenty-five teachers, and six hundred students aged from 3 to 18 years from schools in Greece, Portugal, Brazil,¹ Spain, and Sweden. We used action research methods and collected data through reports from teachers, focus group interviews, and questionnaires. Digital tools and interactive media were used for communication and content creation to share students' micro-narratives about their different identities, spaces, communities, and sites where they lived. Authorship of the video narratives was kept, and consent forms were signed by all the participants to publish the produced works on the project website and in other publications. The project objectives were influenced by European recommendations to foster digital literacy, such as DigComp and OECD (2018). The students in the project learned to articulate information needs in order to create soundscapes; to search for data, information, and content in physical and digital environments; and to access and navigate between them. They created and updated personal search strategies and

¹The project, although conducted mainly in European countries, was not restricted to the European continent. Teachers from Brazil, who heard about the project call through the Portuguese Association for Teachers of Visual Expression and Communication (APECV), were asked to join—despite the different geographical contexts, the contributions from students in Brazil were very similar to those from Europe.

learned how to analyze, interpret, and critically evaluate audiovisual and written data, as well as information and digital content. Students were helped by the teachers to organize, store, and retrieve data, information, and content in a structured digital environment to build collaborative narratives about their living contexts (Delgado et al., 2015).

Teacher Rita and students in one primary school in the north of Portugal learned how to digitally record and edit sound to interview grandparents about forgotten rural rituals of their villages. Visual arts teacher Fernanda and students from another Portuguese primary school discovered the daily sounds of their homes to build a richer awareness of their surroundings. They learned how to digitally record with a smartphone, and through simple audio mix software they explored sound narratives in the tablets and computers using the concept of soundscapes. Visual arts teacher Tiago worked with secondary school students in Guarulhos, São Paulo, Brazil, to explore the five senses through several walking exercises in the school—by avoiding vision, students were more aware of sounds. Through a sponsorship for the project, Tiago was able to provide a tablet to each student one day, to record sounds and images in the courtyard of the school. Later, students made a collective digital map with all the sounds and images collected during the walking exercise. Also in Brazil, Carla and her students, in a secondary school in Belo Horizonte, recorded through photography the social landscape of the city to make a collective digital interactive panel about the city, where each photograph was linked to a sound. In Diadema, Brazil, visual art teacher Ariclaudio and his students explored the school environments through observational drawings and recording sounds with smartphones. In Greece, teacher Maria and her students developed digital photography to produce a narrative about the city of Thessaloniki in a narrative platform. In Spain, teachers Carmen, Alfredo, MariPaz, Isabel, and Maria involved students from teacher training in the University of Jaén and public schools in the region to record, understand, and remix the soundscapes of children’s preferred places in the city of Jaén (Torres de Eça & Moren, 2014).

In creating the collective soundscapes, students learned how to record and transform sounds and images, and they reflected on the places, their history, and their cultures to construct a collective narrative that they shared with students from other locations and countries in the project blog. The project developed Martin’s (2006) goal “to communicate with others using digital means, in order to enable constructive social action; and to reflect upon this process” (p. 155). In the process of constructing

the narratives using sounds and images of the places, students gained great awareness of their history and culture and reflected on ways to preserve and take action in their communities. The students also understood the legal literacy aspects of digital communication, such as right to privacy, copyright, and licenses and permissions for the use of content and software. Thus, through this art project, teachers helped students to develop all the DigComp skills. In addition, by using digital media, the students were able to gain greater appreciation for the places where they were living, developing a sense of belonging and respect, which is vital for civic engagement and participation toward more sustainable societies.

DIGITAL MEDIA ARTS PROGRAM

As we have seen in the Soundscapes project, teachers have an increasing interest in new media and digital arts, which they realize can offer many learning and experimental situations for the development of digital skills (Martin, 2006). To address artists' and art teachers' need for specific knowledge in digital media arts, a PhD program was developed in 2012 by the University of Algarve & Open University of Lisbon, Portugal, on new media and digital arts.² Called the Doutoramento em Médiá-Arte Digital (DMAD), the program includes many students who are practicing art teachers from Portuguese-speaking countries (Portugal, Brazil, Angola, Mozambique, and Cabo Verde). It is a distance education program over three years, with online classes and a collective artist residence each year, where all doctoral students have the opportunity to develop digital media artwork in groups. The program is now in its fourth edition.

The program goals are to train professionals in digital media arts for diverse working areas (research, education, art, and information technology). The modules are designed to explore skills in computer technologies, communication sciences, and artistic and intercultural agency. Students are expected to acquire skills to create innovative aesthetics discourses, and to exploit the informative and sensory expressiveness of multimedia content, technological interfaces, and interaction. The final work of the program is the construction of digital or multimedia artifacts for creative industry, education, or entertainment.

We believe this program is helping to change the way art teachers introduce digital technologies in their classrooms. In the following sections, we

² See <https://www.ualg.pt/en/curso/1714>

will describe two projects developed by art teachers enrolled in this program: The Pixel Project, created by a group of students at the end of the program, and another project created by a student who had completed their PhD in the first edition of the program.

The Pixel Project and Intergenerational Collaboration

The Pixel Project was conducted in 2017 during a DMAD course as a collaborative experience between doctoral students, students in the Master of Arts in Education at the Open University of Lisbon, and their students in public primary and secondary schools. Doctoral students developed a call for collaborative work using the concept of the pixel as a metaphor to develop creative work using an installation and performance event in a gallery of the university. The project was carried out both remotely and in person. Doctoral students created an installation using the shape of a pixel as an architectural module and invited other participants from the master's course to develop performances to be integrated in the collective installation with their primary and secondary school students. The main objective was to create a collaborative and intergenerational artistic action.

In group conversations, the doctoral students addressed new digital media, contemporary art, and different forms of communication. The concept of the pixel was explored and students were invited to reflect on the definition and its role in digital technology and as a metaphor. The children and their teachers (the master's students) then developed their collective works to bring to the installation in the gallery. A group of younger students built clothes made of dots (pixels), becoming hybrid elements, between digital and physical. They performed dressed as pixels, during the opening day, as living works of art, a concept inspired by Brazilian artist Hélio Oiticica in the 1970s (see Fig. 9.1). Another group of secondary school students produced a performance using bodily expression to interact with the installation.

This collaborative project, developed over several months, addressed important issues of digital literacy, helping teachers and students to reflect on their relations with the digital world through the exploration of contemporary art processes. During the group conversations to create the performance, they were able to think about and critically analyze the dangers and benefits of the digital communication. For the final event in the gallery, for an audience of professors from the university, artists, family, and friends, children explained their views about the topic Pixel. This was



Fig. 9.1 Performance during the opening of the installation *Pixel* at In Vitro Gallery, Open University of Lisbon, Palácio Ceia, May 2017. Photo by Ângela Saldanha.

the culmination of the project and made visible the voices of children in the university.

Young people's voices are not very often taken into account by educational developers. However we must recognize they already have acquired knowledge and skills that may be integrated in the school learning projects. In the next section, we will explore the idea of agency of children and young people in the maker culture.

Augmented Reality and Collaborative Virtual Learning

In Portugal and Spain, students from medium/high-income families very often learn alone or in collaboration with others using the internet. Normally they look for video tutorials and learn through making in a digital/virtual makerspace. Several popular computer games are designed grounded on the idea of makers, such as Minecraft, and the maker culture emphasizes learning-through-doing (active learning) in a social

environment. Makers are interested in using and learning practical skills and then applying them creatively to different situations in both traditional and digital art practices. Digital makers create, design, and play with visual content, using creative and technical abilities through open-source software and platforms (Schön et al., 2014).

Some educators and teachers, acknowledging these ways of learning and making, are integrating gamification strategies in their teaching methods. In Portugal, educational game-based activities, augmented reality (AR), and geo-referencing applications have been used by some art educators as effective strategies to enhance the learning process. For example, music educator José Gomes, one of the first DMAD students, explored AR and mobile computing in his teaching practice. He merged mobile computing devices and AR as a means to engage students in collaborative learning toward the aesthetic periods of music history. With groups from a secondary school, Gomes promoted the use of mobile computing devices (smartphones/tablets) in a digital game. Students have to find eight stations scattered in a set location, and then use their music literacy skills to find the correct answer in each station. Collaborative work was required to find the stations and the answers to the clues (Gomes et al., 2017). Gomes advocates for more ludic models of assessment, using AR games in smartphones, and argues that assessment must be a fun and rewarding activity. Gomes's teaching practice is an example of the impact of European recommendations about integrating digital competencies in the curriculum, such as DigComp.

Summary

These two examples show the move in art education toward using digital tools and technologies to create knowledge and to innovate processes and products. However, we believe it is important to emphasize that using technology per se is not an emancipatory or transforming tool in education for citizenship to achieve a sustainable future. To respond to DigComp aims such as engaging students individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments (Carretero et al., 2017), we need more holistic, humanistic skills that allow the development of critical thinking and students' agency by connecting digital literacy with other literacies across the different learning areas (see, e.g., Directorate General of Education, 2017). In that sense, Media Arts in Art Education is one of the

subject areas where critical thinking and students' agency can be developed. Educational strategies directed to the exploration of skills to make digital products in virtual collaborative environments, developing media and digital artistic projects, may be consistent toward a curriculum that fosters informed global citizens. Like any other communication media, digital tools offer possibilities to develop system thinkers (Scherling, 2017). The teacher may facilitate situations and the problem-solving skills to raise questions and stimulate interconnections, where participants handle "tensions, dilemmas, and trade-offs, for example, balancing equity and freedom, autonomy and community, innovation and continuity, and efficiency and the democratic process" (OECD, 2018, p. 5). Some technologies such as cell phones with internet access are becoming more common and accessible, but still many problems exist in terms of literacy and social censorship, which can prevent their use for self-learning and emancipatory purposes, as noted in a UNESCO report on cell phones and literacy (Belalcázar, 2015). The report analyzed case studies conducted in nine rural communities in sub-Saharan Africa (three projects: Niger, Senegal, Somalia), Asia (five projects: Afghanistan, Cambodia, Pakistan, and two projects in India), and in the Arab states (Morocco). It concluded that although all the participants acquired entrepreneurship skills with the possibility of self-learning with access to global information and networking possibilities outside their villages, the project was more successful in terms of critical literacy, where the learning process was facilitated by a teacher in a collaborative process with the communities. Communities and their social interactions can hinder access to cell phones and their use as learning or empowerment tools, yet they also can facilitate such use through peer-to-peer support and collective learning strategies (Belalcázar, 2015). Critical literacy is understood as the extent to which literacy empowers learners to bring about change within the "problematics of power, agency and history," as Paulo Freire stated (Freire & Freire, 1997).

MEDIA ARTS EDUCATION GIVES A NEW PERSPECTIVE FOR DIGITAL LITERACY

For us, Freire's approaches to education as transformation and student's agency are very important. Education generates transformation in the way it gives critical skills and agency to deal with power manipulations, such as fake news and manipulated images, and the excess of unprocessed

information in the discourses vehiculated by information technologies. For the Italian philosopher Francesco Tonucci (2008), school should be the place where students learn how to use and control information technologies, but we need to acknowledge that students also learn in other places, and have access to a vast range and amount of content on the internet. Discipline knowledge alone is not enough to equip students with the skills they need to become active, responsible, and engaged citizens in societies where the flux of information is digitally embedded in images and sound.

In the Soundscapes and Pixel projects, students explored how to interpret and use new media within art subjects. As Lind and Hellman (2020) point out, “the visual and digital productions of young persons, articulate and elicit the virtual of the presence and questions about what worthily worlds will be” (p. 79). Artistic processes of inquiry and creation help the learners to question the sources; play with materials and contents; cut and paste; transform; and form collages, new interpretations, and a critical lens toward available information. Although the European DigComp framework integrates safety and problem-solving issues, we believe educators, and especially art educators, need to push it further in terms of civic participation through the creative use of digital media to raise questions and take action on urgent global issues such as social justice, ecology, and sustainability.

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The Significance of Media Arts Education from a Cognitive Science Approach

Osamu Sahara

The development of the internet has changed our awareness of places, things, and time. This cognitive transformation has caused strange distortions in our social reality (Narita, 2015).¹ More than ever before, our subjective reality can be constructed by symbolic reality rather than objective reality. This research focuses on how media arts education can play a role in our twenty-first-century knowledge-based society. Japan has included image media education in the national art education curriculum since 1998 (see Ministry of Education, Science, Sports and Culture,

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¹All translations from Japanese texts in this chapter are my own.

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1998).² In 2021, twenty-three years on, several points to consider have emerged regarding image media education in Japan.

The core philosophy of art education in post-WWII Japan has been to aim for personal individuation and mental growth based on the inner expression of oneself (Keitoku, 1999, p. 3). Therefore, cultivating *kansei* (aesthetic sensibility) has been regarded as the central value for the national art education curriculum since 1989. Since then, art education researchers in particular were concerned that image media education was not in line with the central values of Japan's art curriculum. Image media was considered to contribute negatively to the healthy development of children. For example, the experience of fire cannot truly be understood only through image media. Art education researcher Okada (1993) especially argued that art education should emphasize direct experience to cure children's carelessness for vital phenomena caused by indirect experience. Behind this, there is an idea, as the cognitive linguist George Lakoff (1987) says, that humans accumulate various concrete experiences through physical activities in daily life, and they ideate a mental representation called image schema in their brains and conceptualize the world. Lakoff (2014) has also mentioned that it is essential to focus on physical somatosensory perception to conceptualize the highly abstract concepts important to human social activity.

Although direct experience is undoubtedly valuable, it is not always achievable. Our generation has acquired the most knowledge through digital images compared to any other time in the past. Looking back on how image media has been included in our national curriculum and considering several art educators' discussions on this topic, a unique and characteristic viewpoint emerges. This viewpoint is about how we can humanize image media, according to the Japanese art education researcher Mitsuru Fujie (1993), who notes that focusing on connecting visual images and tactile sense is vital for (media) art education—that is, human perceptions, including somatic sensations, can be ideally expanded with new digital technologies. Therefore, I have been researching how image media can richly conceptualize through ideating somatic perception and raise

²According to the media arts curator Tomoe Moriyama (2002), image is something that concerns presented or projected visual matter and does not refer only to moving images such as animations and movies. The Japanese national art education curriculum has specified media technology as photography, video, computers, and so on (Ministry of Education, Science, Sports and Culture, 1998). Therefore, in this paper, image media is defined as a medium that expresses, records, reproduces, and delivers presented or projected images.

interest and a sense of reality for the context of visual images through interactive manipulation, such as enlarging details, colorizing, and editing footage repeatedly (Sahara, 2013a, 2013b, 2016, 2018a, 2018b, 2018c, 2020, Sahara et al., 2020). I have defined this phenomenon as visually triggered ideated somatic knowledge (V-TISK) throughout this research.

This chapter focuses on clarifying how visual stimuli activate tactile sensations in our brain and how visual image manipulation is related to these sensations. Near-infrared spectroscopy (NIRS) is used to measure the activities of image media perception on students' brains. This chapter begins by summarizing discussions of the educational principles that led to the inclusion of image media, which is generally synonymous with media art, into art education. It then focuses on V-TISK, which is deeply related to such discussions, and describes its educational practices and effects. Finally, the mechanism and condition of V-TISK are empirically clarified by measuring brain function with NIRS, and through follow-up semi-structured interviews.

MEETING POINT OF IMAGE MEDIA AND ART EDUCATION

The definition of the word “image” contains two aspects. One is the image as part of the real world we see with our own eyes, and the other is our imaginative perception of it in our mind. In other words, our thinking is captured in a bidirectional relationship between the outward and inward. According to the *Online Etymology Dictionary*, this meaning of “reflection in a mirror” dates back to the early fourteenth century, and the mental sense, in Latin, appeared in English in the late fourteenth century (Harper, n.d.). Furthermore, the “sense of ‘public impression’ is attested in isolated cases from 1908 but not in common use until its rise in the jargon of advertising and public relations, c. 1958” (Harper, n.d.). This essential bidirectional relationship might be one reason the affinity in art education toward visual media is so high. Art education is also a subject that cultivates the aesthetic filter between the real world we always see with our eyes and the image in our mind through creation and appreciation processes.

Especially after the media developments of the twentieth century, we, as human beings, have come to understand diverse images not only through the world in front of us but also through various types of image media such as photos, films, TV broadcasting, and more, which we constantly encounter throughout our day. This diverse image perception forms our ideas about the world in our minds. Moreover, this has

increasingly expanded through online culture development in the past three decades or so. Conversely, we also have the power to imagine an ideal world, visualize it, and share it with others through image media. This bidirectional image exchange always occurs inside and outside the body, like breathing. Art education is the only subject in the public school curriculum that deals with visualizing and forming knowledge richly in this way. As access to mobile devices and the internet is now also increasingly common among children, it is not difficult to see how image media is significantly impacting children's ideas and knowledge. We know about more things than ever in our history. We have excellent opportunities to obtain new information and ideas through the internet and other media. However, if we only perceive these concepts through indirect experience, we might know a lotus flower, for example, by sight, but not know the scent or feel of it.

In Japanese art education, this increase of indirect experience was one of the background concerns leading to the introduction of the image media field into the national standards for art education in 1998 (Ministry of Education, Science, Sports and Culture, 1998). As Fujie (1993) noted, focusing on connecting visual images and tactile sense is very important for (media) art education. All three types of visual arts textbooks currently certified by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) introduced interactive video artworks as student reference works based on this idea (see Mitsumura Tosho Shuppan, 2009; Nihon Bunkyo Shuppan, 2009; Nihon Zōkei Kyōiku Kenkyūkai, 2009, 2016). These reference artworks enhance the connection between the visual image on a screen and physical operation. In one example, a camera is set into a kaleidoscope and the kaleidoscope is physically rotated to see the image on a TV monitor (Nihon Bunkyo Shuppan, 2009), which shows that students enjoy operating the kaleidoscope reflected on the monitor through the camera.

Another major influence on these movements is that of media artist Toshio Iwai, who is introduced as a representative artist for the image media field in every art textbook (Mitsumura Tosho Shuppan, 2009; Nihon Bunkyo Shuppan, 2009; Nihon Zōkei Kyōiku Kenkyūkai, 2009, 2016). In 2009, Iwai conducted a workshop to connect the body and the image at an elementary school, broadcast as “ETV Tokushū: Mezameyo Shintai, Kankaku no Uchū” (ETV Special: Awaken the Body, the Universe of Sense). In this program, Iwai (2009) calls attention to the importance of connecting tactile sense to images:

As a media artist, I find that there are moments that I, myself, am twisted by using a variety of technologies such as computers and cell phones. I don't think it can be passed on to children as if it is definitely a good thing. Communication through the human body in real space and communication in the virtual world such as the internet are completely separate, and I feel that this gap is the cause of various incidents happening in the world. However, today's children are very much surrounded by such technologies and media. It may no longer be very interesting to set up classes by focusing on the traditional approach. That is why the class content I thought out this time is important.

As Iwai emphasizes, the gap between communication through the human body in real space and communication in the virtual world is crucial for teaching media arts. In other words, this is a matter of how media arts education contributes to raising the social construction of reality. This social reality concerns the distance of social elements from direct experience (Adoni & Mane, 1984). Hitoshi Sakurai (2013) from the NHK Broadcasting Culture Research Institute also pointed out that social reality has become a situation in which images are overflowing. In this situation, people have started to hide their anxiety inside their deep consciousness and minimize their physical expression (Sakurai, 2013).

Focusing on the interactive process of connecting visual images and tactile sense is very important for gaining a heightened sense of reality. To do so, the manipulation process of interacting with images through such actions as projecting, enlarging/reducing images, manipulating time, copying, overdrawing, and listening or adding sound will be one of the keys for teaching image media in art education.

I have been working with this type of introduction activity that connects tactile sense and image in my media arts classes. An image can be projected on the wall by shining a flashlight toward oneself and collecting the reflected light with a magnifying glass. When experiencing the moment that a projected image is born and recognizing its direct connection with themselves, most students respond with comments such as "It is not black and white"; "It feels so strange!"; or "What a surprise, it's so real!" The students seem to capture a sense of reality in the images and their connection to them (Sahara, 2017). My research results show that connecting tactile sense and visual images through the interactive manipulation of video images raises students' interest and heightens their sense of reality, and they start to care more about the context of image media (Sahara,

2016). Such practices would be very effective as an introductory stage for the image media field in art education. When students are given a heightened sense of reality, they care more about the world. Art education may be the only educational subject field to train students to obtain this type of knowledge, which is defined as V-TISK (Sahara, 2017). Thus, fostering V-TISK is one of the purposes for teaching media arts education in Japan.

WHAT IS V-TISK?

I have been advocating V-TISK based on the history of research of how tactile sensation is connected with visual matter (Berenson, 1948; Bruno, 2002; Fujie, 2012; Kaneda 1984; Riegl, 1966). According to Berenson (1948), “ideated sensations ... are those that exist only in imagination, and are produced by the capacity of the object to make us realize its entity and live its life” (p. 74). Berenson defined ideated somatic sensation as life enhancement and the communication of humankind’s energy, vitality, and excitement. In the Japanese art education context, Fujie (2012) summarized this type of ideated sensation as part of integrated knowledge, which is physically possessed through the student body. He insisted that somatic knowledge from the perspective of cognitive psychology will support the idea of physicality in art activities.

Since the 1990s, Japanese art educators have considered physicality a crucial element for the inner expression of a student’s self for cultivating personal individuation and mental growth (K. Shibata, 1993). Indeed, when we see visual matter on the monitor, the tactile sensation will be ideated based on our past experience, and technology such as image media always requires the viewer to have an analogical somatic interaction, just like breathing. When playing a game, for example, the visual and physical senses are closely connected, and it often feels like our body is moving in conjunction with the movement of the screen. Also, many readers may be familiar with the experience of salivating when seeing an image of juicy lemons. We tacitly project our somatic sense to images, and we perceive the physical sensation of images smoothly and richly. It is not a unitary sensory interaction but a whole-body sensation and therefore accumulates as knowledge. In art education, it is possible to draw out rich and aesthetic sensibilities and ideas and form knowledge by actively aiming for lesson plans that encourage students to ideate somatic perception from visual images through image media creation and manipulation. Therefore, V-TISK, or visually triggered ideated somatic knowledge, refers to a

process in which a physical sensation is implicitly or actively projected onto the visual senses through the act of appreciation or creation of visual images, and their perception and comprehension.

METHODOLOGY FOR UTILIZING THE MATERIAL CHARACTERISTICS OF IMAGE MEDIA

In a Japanese art class, it is often considered an essential process to cultivate rich ideas and knowledge of the target subject by observing and touching. Especially in the 1990s, image media was considered to give only indirect experience. However, considering V-TISK, image media is a new tool to observe the target subject and provide a new type of experience. Image media tools, such as the camera and monitor on smart devices, are not only limited to visual observation but can also be used for a tactile perception approach. The process of generating somatic sensation through observing the detailed texture or kinetic movement of an image is a new type of observation experience that only image media can provide. Therefore, cultivating V-TISK can also be used as a strategy to seek more profound insights into images and the target context.

In a media arts class, activities such as stretching time in video images and observing the details of motion, repeatedly playing back the video to check the continuity of the motion, and magnifying the details of the texture features can be considered a process for fostering V-TISK. These activities are also reasonably possible with smart devices. In other words, V-TISK is a way to obtain knowledge through the analogy of physical connection, which will expand students' ideas about the physical object beyond the normal recognition process. The V-TISK method can be effectively used as an additional observation method for traditional art classes as well. Given that image media has been included in the revised curricula for junior high schools and senior high schools (Ministry of Education, Culture, Sports, Science and Technology, 2017, 2018), it is essential to connect physical and embodied experiences with visual images as the basis of various practices.

AN EXAMPLE MODEL OF THE V-TISK LEARNING PROCESS

“Looking at the world through photo colorization” is one of my class activities in senior high school and above, which includes the V-TISK learning process. Students collect personal media, such as old black-and-white photos, from their relatives and local residents. The class focuses on a project that repeatedly works on a detailed photo colorization and interview process. Students conduct interviews with elders in the community who know the context of the era. The main goal is for students to learn about their roots and local social context through photos (Fig. 10.1). In this case, the photo colorization process works as a V-TISK protocol (Sahara, 2018a, Sahara et al., 2020). Students are naturally required to observe the photos’ details repeatedly. They also naturally magnify the texture features’ details to colorize the photos many times.

According to the semantic differential scale survey (Sahara, 2018a), which compares photo impressions before and after the class, tactile senses such as warm and cold impressions were inevitably heightened after the photo colorization process. In addition, students indicated they felt a greater sense of reality from the colorized photos. In a follow-up interview after the class, some of the students mentioned that they could feel the scent of the things in a photo. Some others who worked on their family photo said, “the soul is back,” and many students mentioned that they felt as though they had revived their relatives. Furthermore, while working on this process, some students mentioned that they could smell the scene in an old photo, and others could feel the temperature from one. It is



Fig. 10.1 My demonstration work for a photo colorization class in February 2020: A New Year family reunion in Toyohashi, Aichi Prefecture, Japan, in 1941.

interesting to see that some students ideate somatic perception and reality beyond physical objects such as photos.

IS V-TISK REALLY HAPPENING IN OUR BRAIN?

As mentioned above, connecting tactile sense and visual images through interactive manipulation, such as enlarging details, colorizing, and editing footage repeatedly, will cultivate V-TISK and raise students' interest in the visual images. It also gives students a heightened sense of reality, so they will care more about the world. This raises the question of whether such a process actually takes place in our brains. Therefore, this research focuses on clarifying how a visual stimulus activates tactile sensations in our brain and how visual image manipulation is related to these sensations.

For that purpose, NIRS was used to measure the targets of Brodmann area 5 (BA5) and Brodmann area 7 (BA7) in my university students. NIRS has been used for the noninvasive monitoring of oxygenation in living tissue since 1977 for the purpose of studying brain functions (Jöbsis, 1977). Brodmann areas were originally defined based on the cytoarchitectural organization of neurons by Korbinian Brodmann in 1909. BA5 is involved in somatosensory processing by integrating tactile sensation through Brodmann areas 3, 1, and 2, which are involved in the primary somatosensory cortex. BA5 thus receives extensive projections from the somatosensory cortex and input from the vestibular system. Also, BA7 is visuomotor coordination that is involved in locating objects in space (Haines & Mihailof, 2017).

It is well known that a patient who has lost a part of their body in an accident feels pain in that part. In clinical practice, pain within nonexistent areas is alleviated by using a mirror to give the illusion that a body part exists (Ramachandran et al., 1999). In other words, a visual stimulus may activate BA7 and even BA5. Nevertheless, until the early 2000s, it was thought that only a somatosensory sensation was projected in the postcentral gyrus, where the primary somatosensory center is located in the foremost part of the parietal lobe (Iwamura, 2006). However, reports show that the posterior or intraparietal sulcus region of the human somatosensory area is multisensory, and visual and somatosensory stimuli activate it (Blakemore et al., 2005; Haggard et al., 2003; Keyzers et al., 2004; Oouchida et al., 2004). As these findings have not yet spread to media arts education research, there is no research on how the educational activities of media arts affect such brain function. Therefore, NIRS was used to

investigate to what extent BA5 and BA7 are activated by visual stimuli using photo colorization as a sample activity of media arts classes.

In 2020, I conducted an initial experiment with a twenty-year-old student who had taken my photo colorization class in the preceding year. The student was shown various images in a quiet, dark room while sitting on a chair. Measured by NIRS, a total of sixteen images were presented, one every 20 seconds. Two of the images were those the student had spent three days colorizing. Other images were nonexperienced photos for this student. The results of the experiment confirmed that visual stimulation activates BA5 and BA7. Although it is considered that the experience of image operation tends to stimulate significant activation of the tactile function in BA5 and BA7, accurate confirmation of this required an increase in the volume of data.

Consequently, I repeated the experiment with twelve students in 2021. BA5 and BA7 were activated for seven students by nonexperienced photos, and for eight students by experienced photos. BA5 and BA7 were activated for six students by both experienced and nonexperienced photos, whereas three students did not respond to either experienced or nonexperienced photos.

Therefore, it is assumed that there are four stages in ideating tactile sensation from images. In the first stage, it is difficult to recall any tactile sensation with any images. In the second stage, if we gain some experience in operations such as the colorization of a photograph, we will be able to experience tactile sensation in images that we have experience with. In the third stage, the tactile sensation of the experienced image is saturated by the operational work, and the tactile sensation is found in the nonexperienced image. In the fourth stage, we will recall a tactile sensation for any image. On top of that stage, such tactile sensations could be observed as a characteristic of individual brains, and it is assumed that these types of skills can be developed through media arts education.

During this experiment, it was discovered that two students have aphantasia,³ which means they have never been able to recall images in their mind, and I confirmed that their visual cortex did not activate when they were asked questions that recall images while being monitored by NIRS. At this time, all the other students' visual cortexes were activated by a prompt such as "imagine hot green tea." In other words, it can be

³Aphantasia is defined as "the inability to form mental images of objects that are not present" (Lexico, 2021).

seen that these sensory characteristics of the brain are significantly involved in how individuals perceive the world. Media arts educators need to pay careful attention to this phenomenon when considering these perception types and stages.

CONCLUSION

By incorporating the iterative image operating process of media arts education, such as enlarging the details of an image, colorizing, and editing footage repeatedly, there is a tendency to experience the tactile sensation cognitively as if one were touching the image, even though one might only be seeing the images visually. I have defined this process as V-TISK, the existence of which has been confirmed by this research from the perspective of cognitive science. The results suggest its potential for learning and its relationship to complex perceptual conditions such as aphantasia.

Media arts education may be the only educational field to cultivate this type of knowledge in students. Image media only gives indirect experience, which is generally shown to be cut off from a sense of reality. Such a loss of reality slows down the development of sensibility in many situations. As media artists and art educators have pointed out, it is important in art education to provide a physical experience to activate all one's senses and cultivate aesthetic sentiment and artistic skills. Tactile stimuli are especially essential. Recent research clarifies that "different types of stimuli activated each corresponding primary sensory cortex, and, in newborn periods, tactile stimuli resulted in broader brain activation compared with other types of stimuli" (M. Shibata et al., 2012).

This study shows that it is also exceedingly important to increase tactile sensitivity to visual images through media arts education. We obtain information through image media more than any other people in history. Therefore, media arts education must focus on connecting indirect experiences and tactile senses to develop a kind of aesthetic sensibility that helps students better perceive the reality of visual images. This discovery can be a robust rational reason for teaching media arts education in general education. It also suggests that this V-TISK process is beneficial in various fields, such as reminiscence therapy for dementia patients using photo images in medical institutions because the tactile stimulus is also associated with various memories and aesthetic sensibilities.

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Entanglements in AI Art

Tomi Slotte Dufva

The world of artificial intelligence (AI) and art is crowded with hyperbolic questions ranging from the role and death of art to the proclamation of AI art as boring and not actually art (Audry & Ippolito, 2019; Jones, 2019; Mazzone & Elgammal, 2019; Reich, 2019). AI has also been introduced as a hallucinatory, deep dreaming engine (Apprich et al., 2018), or for instance, as a medium to make “visually beautiful” paintings (Zylinska, 2020, p. 11). How, then, are the discussions around AI and art formed? What does AI art mean to media arts education, and what kinds of future paths might AI art pave besides these often highlighted and hyped pictures of it?

These questions bear a similarity with the general discussion around AI, where the meaning of AI is often ambiguous, a mix of realistic views and unrealistic hopes (Cave et al., 2019; Selwyn et al., 2020). These ideas are often amplified by the media, creating an image of AI as both commonplace and at the same time extraordinary (Cave & Dihal, 2019). Furthermore, studies suggest that popular media lift the voice of a limited homogenous group of high-ranked white males and do not challenge the

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status quo, limiting the discussion around AI (see, e.g., Chuan et al., 2019; Fast & Horvitz, 2017; Slotte Dufva & Mertala, 2021).

In this chapter, I examine the issues of AI and art through a feminist phenomenological and technological feminist framework in order to situate AI art in the sociocultural context of the current era, where AI is entangled with everyday life and embedded in the societal infrastructures (Crawford & Joler, 2018; Hayles, 2017). Can art challenge the status quo of AI and, if so, what kinds of alternative figurations could it offer? The feminist phenomenological framing offers a way to examine AI from the context of subjective perception. At the same time, feminist phenomenology accounts for the sociocultural, economic, ideological, and political figurations of how something, in this case, AI, is made visible (Fielding & Olkowski, 2017a). Similarly, the technological feminist theory inspects the multiple challenges within AI as complex entanglements (Bassett et al., 2019; Hayles, 2008, 2017). In the context of AI art and education, this framework allows both for the tangible, material nature of AI, the AI as an artmaking medium, to be discussed without dropping the complex social challenges of AI from the discussion. Embodied knowledge and critical abstract thinking are uniquely combined in art education (Efland et al., 1996; Räsänen, 2000), enabling interesting places to study AI.

This chapter is structured as follows: The following section introduces and clarifies feminist phenomenology and technological feminism. It also lays the groundwork for thinking about and evaluating AI. The next section positions AI in the context of contemporary art and presents artists working with AI. By highlighting the work of artists, it aims to pave possible paths for AI art. This chapter closes with a discussion of future paths for AI art, especially in the context of global media arts and education.

THEORETICAL FRAMEWORK

At least for the last century or so, one of the dominant ways of comprehending the world is through the human subject: how the world revolves and manifests around us and how we engage with the world. The phenomenological method has been significant in helping us to understand how we embody the world and how the knowledge of the world is in relation to our (bodily) being (Heidegger, 1967; Merleau-Ponty, 2012). The phenomenological attitude has also been significant in many theories relating to arts and crafts, for instance, in bringing forth the significance of making by hand (Kojonkoski-Rännäli, 1998; Sennett, 2008) or making

art (Chaplin, 2005; Parry, 2010). However, many researchers have criticized phenomenology because it accounts for the human subject as neutral and value-free, whereas it may be argued that the neutral is often associated with the dominant conservative view and not value-free at all (Fielding & Olkowski, 2017b; Neimanis, 2017). Moreover, concentrating solely on human subjects' relation to the world may disregard the complex socioeconomic and cultural spheres the human subject exists in. Recent discussions of the climate crisis and the Anthropocene have further questioned human centeredness (Fielding & Olkowski, 2017b; Haraway, 2016; Neimanis, 2017; Shabot & Landry, 2018). In short, the human subject is not a simple unit with defined borders, and it does not exist in a void. Furthermore, the ubiquitous nature of digital technology has abstracted the perceived world by decentralized and often invisible processes that are hard to grasp (Dufva et al., 2020; Dufva & Dufva, 2019). Searching for the nearest cafeteria with a smartphone, for example, incorporates satellites, data centers, and complex algorithms into a complex entanglement of human and nonhuman actors and therefore, in part, challenges the anthropocentric embodied comprehension of the digital and physical world.

However, in this chapter, I highlight the importance of embodied being, not only as a way to talk about AI as a material and medium for artmaking but also as a broader societal question of grasping AI. In earlier work, I have proposed “digi-grasping” as a method for the intentional and embodied meaning-making of a world that is both digital and physical (Dufva & Dufva, 2019). Here I will move further and use the framework of feminist phenomenology to account for the embodied human existence and the gendered-situated subject. Feminist phenomenology displaces the man from the center and the whole notion of the center, allowing for more situational, intertwined, and overlapping possibilities for encounters (Fielding & Olkowski, 2017b).

Together with feminist phenomenology, my views on AI are influenced by the broad spectrum of technological feminism. AI is not neutral and is involved in many processes that accelerate bias and discriminate against divergent thinking and marginalized and minoritized groups, as well as individuals, and accentuate the dominant view and status quo. Therefore, feminist approaches to any technological question are crucial and such is the case with AI as well (Bassett et al., 2019; Bishop et al., 2020; Feigenbaum, 2015; Jarrett, 2015; Sollfrank, 2018). The challenging issues of AI are not limited to questions of gender but reach much further into,

for instance, racism (Dietering, 2019; McQuillan, 2019), control and power dynamics (Apprich et al., 2018; Brundage et al., 2018; Lynch, 2017; Williamson & Eynon, 2020), and sustainability (Crawford, 2021).

Before delving more closely into AI art, a short clarification of AI is needed. Researchers Stephen Cave et al. (2019) assert that AI is a mixed bag of hopes, fears, and reality. They suggest that one reason for the muddled comprehension is that AI is both an agent and an artifact, raising confusion and thus stretching the conventional conceptions of subject and object. Furthermore, AI makes decisions that could be classified as ethical or moral, without AI being a conscious or moral being. Ali Rahimi and Ben Recht (2017) compare AI as something alchemical, referring to both the exaggerated hopes regarding AI's capabilities and its sometimes black-boxed nature—referring to the fact that many current machine-learning algorithms function in a way we humans cannot comprehend, as we can only set the beginning parameters and wait for the end results.

Researchers categorize AI into three categories: weak (narrow), general (strong), and super AI (Fjelland, 2020; Naudé & Dimitri, 2020). Weak AI is domain-specific, meaning that AI might be efficient in a particular task, but this capability cannot be generalized. For instance, AI, such as Google's BigGAN (Brock et al., 2019), can produce photorealistic images of people's faces. However, the same AI cannot then be tasked to create a sculpture or write about the people, nor can it extend the face into a whole human body. Its "intelligence," therefore, is restricted to a narrow area of finding the best-optimized algorithm from vast sets of data, as McQuillan (2018) notes. All the AI we are currently encountering is located within the category of weak AI. However, as Nancy Katherine Hayles (2017) notes, this does not mean that such AI would not have a significant impact, but it does mean that AI cannot take over the world or understand art in a human context.

The two other categories represent the expectations and wishes for AI. General AI is an AI in which capabilities can expand beyond a specific domain. In this sense, it is thought to be more akin to human intelligence, capable of applying what it has learned into new things and domains. If general AI can expand its capabilities, it can then make a better version of itself, and it can make this better version faster. With enough iterations, the AI will then explode into a super AI with capabilities beyond human skills. Some advances in machine learning, especially in deep neural networks, are seen as the first steps from narrow to general AI (Lyre, 2020). However, even as super AI remains a science fiction fantasy, the

speculations behind general and super AI are influential and can be seen affecting, for instance, many big tech companies as well as general opinions (see, e.g., Kurzweil, 2005; Makridakis, 2017). Thus, general and super AI are significant in showing how they work in the background, forming our beliefs and expectations of the future of AI.

The expectations and experiences of AI form a crucial role when discussing AI. It affects the way AI is discussed and experienced. Commonplace machine-learning algorithms, such as intelligent assistants, chatbots, or social robots, may be thought of as more intelligent than they are. The human willingness to imagine machines smarter than they are (see, e.g., Lanier, 2010; Turkle, 2011) further accentuates that comprehension. Such an ambiguous comprehension of AI, one filled with hopes, fears, and actuality, undoubtedly affects thoughts on AI art.

A large mesh of different actors and processes play a crucial role in the comprehension of AI and, maybe more significantly, in the construction of society and culture (Apprigh et al., 2018; Williamson & Eynon, 2020; Zylinska, 2020). Hayles (2017) notes how AI incorporates different components—such as sensors, actuators, process, storage with distribution, and networks that are both digital and physical, human and nonhuman—forming complex systems that affect, bias, and construct thinking as well as social, cultural, and economic structures. These entanglements of AI are far-reaching and include factors that are hidden and challenging to grasp (Hayles, 2017; Slotte Dufva & Dufva, 2020), such as the inner workings of AI or the actual material cost of AI (Crawford, 2021; Crawford & Joler, 2018). Similar challenges can be seen in the educational uses of AI, where AI is often seen as a cost-saving factor, creating inequality, uncomfortable power relations between schools and companies, and even simplifying what education, learning, or teaching is (Williamson, 2016, 2018; Williamson & Eynon, 2020).

Even though this text cannot discuss or even allude to all of the related issues within AI, it is worth mentioning that they affect how artists use AI in their art and comprehend it. Moreover, the effects technological structures have in general—how they are entangled with politics, culture, and society (Johnson & Wetmore, 2009; Mackenzie & Wajcman, 1985), for example—remain current in AI as well. Issues such as gender discrimination (Bassett et al., 2019; D’Ignazio & Klein, 2020), colonialism (Couldry & Mejias, 2019), and racism (Devlin, 2017; Dietering, 2019; McQuillan, 2019) are not new but are still evident in AI. All these are significant materials for artists in their practice.

BECOMING WITH ROBOTS, BECOMING WITH EARTHWORMS

Significant and fascinating themes lie behind the facade of AI capable of making art or the denial of AI art. Artist, curator, and researcher Joanna Zylinska (2020) connects AI art to broader questions within art, media, and technology, and asks whether AI art differs from the earlier media arts practices of computer or net art. Researcher and artist Lev Manovich (2019) resonates with this in suggesting that much of the AI-driven art is just a continuation of technologically oriented artist practices, which some argue are more invested in aesthetic visualization than what is usually defined as contemporary art (Hicks, 2019; Kelly, 2019).

However, both Manovich (2019) and Zylinska (2020) agree that AI has the potential to bring about new ways of making art and that AI art may be used in artistic practices to display thoughts that might be difficult to do otherwise. This chapter participates in the discussion by highlighting a feminist phenomenological view based on embodied art practices and complex entanglements of AI.

Intelligence as Material

How does AI differ from other technological artmaking media? Is it just a question of the difference in the degree of technological involvement in the artmaking process (Zylinska, 2020), or is AI art inherently different? Finnish AI artist Hannu Töyrylä (2020), for instance, sees AI first as an augmentative tool in artmaking, referring to AI as an active participant in the artmaking process while at the same time arguing against AI as an autonomous artist. For Töyrylä (2020), AI can “enable, facilitate and encourage experimentation and exploration, while allowing the user to follow her path and direction.” AI then becomes an artmaking material, but it is a material that takes part in the artmaking process.

Töyrylä’s idea of AI as augmenting the artmaking process coincides with a recent ongoing research project that surveys artists’ relation to AI (Lundman, 2020, 2021). The survey highlights the participatory, or augmentative, role of AI in artmaking: it shows that AI was seen as a tool that is playful and demanding at the same time. Furthermore, AI was thought to require a level of technical and experiential knowledge, a sense of how the AI works, to get exciting results. Such a view highlights how artists value materiality even when using AI—being able to grasp how AI might behave and how AI feels bears a significant role in AI art.

The material feel of AI highlights the importance of an embodied comprehension of AI. Moreover, artists also make the AI processes and entanglements visible by focusing on AI's material processes and functioning. Geographer Riina Lundman's (2021) survey mentions how artists have a crucial role in bringing about alternative ways of thinking about AI, highlighting AI's ethical challenges. Such a role is imminent in many works by AI artists, such as Trevor Paglen (Crawford & Paglen, 2019; Paglen, 2016, 2017), Lauren McCarthy (*Lauren McCarthy*, 2021), or Joy Buolamwini (*Joy Buolamwini*, 2021). Common to these, and many other artists working with AI, is the focus on the broad array of ethical challenges from biases of data sets to the misuse of algorithms and the trouble generating facts from data sets. The view of AI as material highlights the importance of comprehending AI in artmaking. By grasping the process, artists also make the ethical questions visible.

Artificial Stupidity and Earthworms

In a recent talk, researcher and artist Janelle Shane (2019) compared the current computer power of AI to earthworms. In a blog post, she continues to say that “The neural network, after all, is a computer program with about as many neurons as an earthworm” (Shane, 2018b). However, what does that mean? In one sense, making art with AI could be compared to making art together with an obedient earthworm. Contrasting the number of neurons in an earthworm to a digital neural network that is only loosely based on biological neurons (Russel & Norvig, 2010) is vague at best. However, for Shane, this opens up opportunities to inspect the weirdness of AI. From flirting AI—“Are you a candle? Because you're so hot of the looks with you” (Shane, 2021)—to inventing new colors—“Sindis Poop” (A kind of greyish green) (Shane, 2017)—she tests the limits of AI and focuses on the failings and edge cases of current AI algorithms. While hilarious, her work lifts up significant challenges in applying AI into social, cultural, or economic structures.

Similarly, Berlin-based artist Hito Steyerl uses the term artificial stupidity (AS) instead of artificial intelligence. Steyerl echoes Shane's work in highlighting how the current practices of (narrow) AI are not really intelligent but nonetheless effective. For instance, Steyerl names bot armies affecting voters' decisions as one way AS manifests itself. According to Steyerl, the intelligence level is shallow, but the effects can still be devastating (Basar, 2019). Moreover, Steyerl argues that AS shows distressing

amounts of arbitrariness and is prone to errors (Crawford & Steyerl, 2017). Steyerl counters the techno-fantasies of super AI led by rich white men in Silicon Valley by turning the discussion toward discussing how AS is changing our thinking and culture already (Crawford & Steyerl, 2017; Manatakis, 2018).

Shane (2018a; Eyeo Festival, 2018) ties the failings of AI with current research and development of better algorithms and the cultural implications of AI, whereas Steyerl connects her AS with various political and ideological issues—she wants to make visible how AS is tied with neoliberalism, racism, and gender bias (Crawford & Steyerl, 2017). While they both use AI in their art, it is more of a phenomenon than artmaking material.

Becoming with AI

Many artists have shifted the focus from the doer-centric perspectives of AI to concentrating on figuring favorable futures and possibilities to become with AI. However, these views of coexisting with AI differ significantly from the fantasies of the super AI mentioned earlier, where AI grants eternal life or ends the life (of humans). These artists want to think about coexisting with AI from the posthuman perspectives of comprehending life from a broader perspective: in which ways can life be sustainable overall, and what are the relations of different actors if we do not automatically place humans in the center? Moreover, they are interested in how AI is developed and which kinds of future worlds (values, cultures, myths) are favored in these visions.

Soungwen Chung explores the space of human and robotic collaboration by creating and working together with robots. In her work *Omnia per Omnia* (2019), she reimagines the traditional landscape painting by painting together with a swarm of robots whose movements are in part based on surveillance data. By placing herself in the middle of the robotic swarm and data, she engages with the robots in what she calls a “multi-agent body” and asks, “What does it mean to collaborate with the spaces we inhabit, the tools we build? Where does ‘I’ end and ‘we’ begin?” (Chung, n.d.-b). *Omnia per Omnia* brings forth the complex and entangled relationship we have with AI and the challenges and questions arising from the embodied experiences of coexisting with intelligent systems.

Chung’s (2019) prize-winning project *Drawing Operations* goes further into the posthumanist feminist territory of coexisting and kinship.

Inspired by researchers such as Donna Haraway, she investigates human and machine interconnections and entanglements or, as Haraway (2016) says, “It matters what worlds world worlds” (p. 35), signifying the need to discuss the premises and preconditions with which we comprehend AI. Chung’s *Drawing Operations* is significant in how it re-poses the embodied experience of making and simultaneously questions how we become entangled with AI, and how AI becomes entangled with other actors and us. Her recent work moves forward with these ideas by investigating symbiotic arrangements between humans, machines, and ecologies (Chung, n.d.-a).

Similar interrogations can be found in the works of Holly Herndon and Jenna Sutela. Both artists are working at the intersection of arts, science, and technology. Herndon’s album *Proto* introduces AI into the music-making process, not as a human replacement but as part of musicians (Claymore, 2019). By working together with AI, Herndon wants to broaden how we think about AI and work against the dystopian futures of the current corporate-led paths (Claymore, 2019). In an interview, she quotes Mark Fisher that “it is almost easier to imagine death than life post-capitalism” (Claymore, 2019), highlighting an interest in bringing forth alternative figurations of AI.

Sutela’s works look at AI as alternative intelligences and consider how to tell different stories with AI. Her work *Gut-Machine Poetry* (2017) is based on the interaction between fermenting kombucha tea and a text database, exploring the idea of a biological computer system and the possibilities of collaboration with more-than-human actors. Herndon and Sutela’s collaboration (with Lily Anna Hayes) on the song “Extreme Love” from Herndon’s (2019) album *Proto* exemplifies the feminist use of storytelling and speculative figurations (de Lauretis et al., 1980; Haraway, 2016) and challenges individualist and anthropocentric thinking by telling a story from the perspective of a macroorganism. As such, their work challenges the status quo of current white, Western, male-centric ideas of AI (Cave et al., 2019; Slotte Dufva & Mertala, 2021). Overall, Chung, Herndon, and Sutela treat AI as a collaborator and actor in the artmaking process, focusing on the possibilities of mark-making or becoming together with AI. Moreover, they simultaneously present a critical introspection into the sociocultural, economic, and political entanglements of AI.

CONCLUSION

The discussions around AI art are diverse. Whereas mainstream media tends to focus on the hype around AI art, artists have found multiple ways to work with AI. From treating AI as material to becoming with AI, the critical and ethical issues around AI are significant and resonate with artists' work. Moreover, the need for embodied comprehension of the AI processes is seen as significant. However, as this chapter has only briefly examined a few artists' works, the intention here is not to define what AI art is and how it is used but to suggest a few interesting paths into AI art.

In general, the comprehension of AI is ambiguous; it is both everyday reality as well as fantasy. AI discussions are full of expectations, future potential, and politics. Looking at AI through art can be helpful as it enables multidimensional introspection. AI can be seen as a concrete material entity like Töyrylä and Steyerl suggest and be envisioned as various future becomings similar to Chung, Herndon, and Sutela. Such views are significant in education, as they allow alternative ways of thinking around AI. Moreover, as AI becomes increasingly more commonplace, being able to critically comprehend AI is crucial.

The artist's views on AI highlight how artmaking can increase comprehension of what AI is and surface alternative possibilities on the future of AI. Through making and critical thinking, art education could be seen as an effective method in thinking about the future outcomes of AI and grasping how AI feels and functions.

Thinking about AI art through the feminist phenomenological framework highlights how the experiential nature of being in this body and experiencing things through this body are still significant: we comprehend our surroundings through ourselves. However, when working with AI, one might not understand it. Notable though is that, even without intellectual comprehension, it seems to be possible to grasp or feel the AI taking place. Moreover, feminist phenomenology lifts how many of these processes do not happen into the same physical space we are located in. By doing so, it offers interesting new ways of thinking about our surroundings that are at the same time digital and physical, locational and global.

The feminist stance in this text is not (only) focused on gender issues (which are inherent in AI) but also on the discussions of the normative thinking around AI and how AI is represented in these views. As Haraway argues (2016), it is crucial to think about how the discussions and the thoughts behind them are formed.

Zylinska and Manovich both argue against using AI as mimicry of human artmaking and instead propose that AI could be used to explore making art in ways that would otherwise be impossible. Manovich (2019) sees that AI could be used to overcome the human limitations of our bodies or brains. Zylinska (2020) expands on this and sees AI art's role in forming futures that might otherwise be difficult to envision. I hope this text joins the discussion by showing the diverse and significant ways artists use AI in their art.

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Artificial Intelligence, Ethics, and Art Education in a Posthuman World

Patti Pente, Catherine Adams, and Connie Yuen

This study explores intersections between, and quandaries mobilized by, the growing emergence of artificial intelligence (AI) in society and art education. For the purposes of this chapter, our working definition of AI is any computational system that is able to “perform tasks commonly associated with intelligent beings” (Copeland, 2021), such as carrying on a conversation, detecting a disease, or driving a car. While AI can be as simple as an algorithm composed of IF-statements, ethical controversies surrounding AI today are primarily driven by the autonomous decision-making capabilities of machine-learning (ML) technologies. ML technologies include supervised learning (training an AI to predict via an organized or labeled big data set), unsupervised learning (training an AI to predict

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based on patterns it discovers from an ill-defined or unlabeled big data set), and reinforcement learning (training an AI to act intelligently via interacting with its environment by reward-based trial-and-error).

Our research into AI, ML, and art education stems from a curiosity about smart technology as an artistic material, creative process, and social force. Employing a theoretical frame of posthumanism, we view human-AI relations as integral aspects of an equitable, evolving, and sustainable worldview. How do artists understand and creatively engage with human-AI systems? What ethical issues are provoked by these new human-technology configurations that pertain to art education in particular and society in general? Objectives for this chapter include a theoretical inquiry into art and AI with respect to critical posthuman thought. We consider some global initiatives regarding AI and its ethical implications. We then identify two artists who work at the intersection of human-AI relations for creative social commentary and who focus on the ethical implications of AI technologies. Finally, we reflect on the potential implications of AI for art education within the context of the global media arts.

POSTHUMAN FRAMEWORK

Our study is informed by posthumanism, which highlights a symbiotic, evolving relationship between human and nonhuman entities (Adams & Thompson, 2016; Braidotti, 2013; Keeling & Nguyen-Lehman, 2018; Pente, 2018; Snaza & Weaver, 2014). Posthumanism's fluid hybridity stands in sharp contrast to the static Cartesian dichotomies that have anchored much of Western thought in humanism. While humanism privileges a radically detached and agential human being at the pinnacle of a hierarchy within the material world, posthumanism emphasizes the ongoing entwinements and reconfigurations of human becoming with nonhumans or more-than-humans, as emergent constructs characterized by malleability and change. As humans are increasingly combining with AI, this chapter argues for a more co-constitutive theoretical stance to engage with new ethico-onto-epistemological (Barad, 2003) possibilities for being and becoming. Through taking human-nonhuman relations into account, posthumanism helps avoid oversimplified, deterministic approaches to ethical quandaries. In this way, it challenges artists, researchers, and practitioners to grapple with the complex assemblages and distributed networks of human-AI encounters and thereby bring digital objects (such as AI) out of the background and into critical inquiry (Adams & Thompson, 2016).

Posthumanism can nonetheless benefit from anti-racist, decolonialist, and social justice interventions (Ellis, 2018), such as attending to Indigenous ways of knowing. Much Indigenous storytelling is characterized by humans entangled with and in relation to nonhumans, derived from long, generational histories based on close observations of the processes of nature (Cajete, 2020). Like posthumanism, Indigenous ontologies do not embrace the Eurocentric humanism that separates and elevates the human above all other matter (Rosiek et al., 2019). However, tensions exist between posthumanist and decolonialist thinking (Sendberg, 2014; Zembylas, 2018). For example, Juanita Sendberg's (2014) account of the Anglo-Eurocentric influence on posthumanism gives pause to consider Western epistemic biases and ontological habits. She notes that structures of Enlightenment dualisms identified within the posthumanist critique, such as self/other or nature/culture, are assumed to be universal. She thus cautions against reproducing colonialist ways of knowing. Here, Jason Edward Lewis and colleagues (Lewis, 2020; Lewis et al., 2018) offer a corrective by studying AI through Indigenous ways of knowing to expose the hidden humanist bias within algorithmic creations. By acknowledging the many generations of such knowledge, we can expand and enrich ethical and ontological understandings of human-AI interactions.

Within the context of education, Siân Bayne highlights the dualisms of humanist thinking as inappropriate for the "age of algorithmic cultures," and she asks, "Where does the human teacher leak into the algorithm, and where does the algorithm leak into the human teacher's practice?" (Bayne & Jandric, 2017, p. 23). In educational contexts, normalized structures based on humanism are becoming increasingly untenable as the reach of posthumanism continues to more accurately reflect the realities of contemporary life. Finally, while posthumanist perspectives bring new theoretical methods for grappling with human-AI relations and knowledge networks, attending to social justice concerns about algorithmic bias may serve to ratify many teachers' shared interests in identifying and dismantling technologies of power.

THE ETHICS OF AI

One approach to addressing technoethical concerns about AI is via policy development. Developing policy typically aims at regulating the humans who design, develop, and subsequently deploy and use these technologies. This decidedly humanist or instrumental approach to ethics assumes

autonomous, agential humans who may need guardrails to act in good ways. Other technoethical approaches involve examining human-AI relations, new distributions of agency, and the evolving co-constitution of humans-in-the-world through their technologies. Such posthumanist interventions are the purview of much AI art. Through unique queries, artists' material explorations are opening hitherto unknown and/or unnoticed linkages among disparate entities. Reckoning with shared distributions of agency within such relations recognizes the entangled permutations of particular ethical issues and can result in a change in attitudes to AI policy within different groups. Both humanist and posthumanist technoethical approaches are called for. We begin by reviewing current global AI ethics policy development that focuses on education, before turning to the responses of two artists.

Current Landscape of Global AI Ethics Policies

Growing public concern over the potentially harmful societal effects of AI has prompted a flurry of publications of AI ethics guidelines and policy documents by national and international government agencies, academic consortia, and industrial stakeholders (Dignum, 2021). AI ethics policy development and partnerships have also been developed globally by public and corporate organizations. For example, Amazon, Google, Facebook, IBM, Microsoft, Apple, and one hundred international nonprofit organizations, industries, and academic institutions are members of the Partnership on AI (2018), a group dedicated to researching and developing best practices in AI technology for the workplace (Vincent, 2017). In addition, some AI artists are asking about the ways that consciousness, creativity, and collaboration are reconfigured as AI advances within the arts (Miller, 2019). The nature of policy development, whether public or private, requires an understanding that multiple ethical issues surrounding AI are concurrently at play. Artists can and do address many of these issues in their work with AI and, consequently, act as public pedagogues within the social sphere.

Jobin et al.'s (2019) scoping review of eighty-four AI policy documents found that geographically, the greatest number of AI policies focused on ethics were developed in the US (24%) and Europe (24%), followed by Japan (4.8%). Key ethical principles revealed in their policy documents include transparency; justice and fairness; nonmaleficence; responsibility; privacy; beneficence; and freedom and autonomy. None of the documents

included AI ethics policy guidance for education. Guidance specific to kindergarten to grade 12 (K-12) education has lagged behind, even though the ethical issues involving AI in the classroom are equal to, if not more pressing than, those in our larger society (Luckin et al., 2016). For example, big data is essential to ML, but student data requires extra levels of protection, including parents’ consent and children’s assent.

In an effort to reveal ethical principles underlying current AI policy development for K-12 education globally, Adams et al. (2021) analyzed five such documents: Institute for Ethical AI in Education (IEAIED) (2021), Southgate et al. (2019), World Economic Forum (2019), United Nations Educational, Scientific and Cultural Organization (UNESCO) (2019), and United Nations Children’s Fund (UNICEF) (2020). Adams et al. (2021) concluded that while current AI ethics policy development in K-12 education shares many of the principles uncovered by Jobin et al. (2019), four additional principles appear to be informing these policy frameworks: pedagogical appropriateness, children’s rights, AI literacy, and teacher well-being (see Table 12.1).

Pedagogical appropriateness refers to a complex of educational values such as child-centeredness, differentiated and personalized learning, and evidence-based school practices. The inclusion of children’s rights—as

Table 12.1 Summary of AI ethics guidelines in kindergarten to grade 12 (K-12) education

AI Ethics Guideline Document	Southgate et al. (2019)	World Economic Forum (2019)	United Nations Economic Scientific and Cultural Organization (UNESCO, 2019)	Institute for Ethical AI in Education (IEAIED, 2021)	United Nations Children’s Fund (UNICEF, 2020)
Ethical Principle Constituency	Australia	International	International	UK & beyond	International
Pedagogical appropriateness Keywords: appropriate use, alignment with learner needs, child-centered AI	Learning with AI	Algorithms for children, assessment and evaluation	AI for learning and learning assessment, monitoring, evaluation and research	Achieving educational goals; forms of assessment	Create an enabling environment for child-centered AI
Children’s Rights Keywords: children’s rights, child rights	Human rights	Child rights	In preamble, aligned with the <i>Universal Declaration of Human Rights</i>	(addressed under other categories)	Empower governments and businesses with knowledge of AI and children’s rights
AI Literacy Keywords: AI literacy, formal and informal AI education, present and future preparedness; AI education; responsible AI	Learning about AI	Public education	Development of values and skills for life and work in the AI era	Informed participation	Prepare children for present and future developments in AI
Teacher Well-being Keywords: teacher well-being; teacher workload; teacher empowerment	(addressed under other categories)		AI to empower teaching and teachers	Administration and workload	
Table Legend:	Major category				
	Subcategory				
	Principle addressed under other categories				

Adapted from Adams et al. (2021)

opposed to human rights—acknowledges the special rights that apply globally to all persons under the age of eighteen. Of the five documents examined, two (UNICEF, 2020; World Economic Forum, 2019) advocate strongly for children’s rights as a unique guiding principle. While UNICEF (2020) focuses on children’s rights and welfare in twenty countries, results show that most are lacking in their understanding and/or appreciation of the unique significance that AI holds for children. AI literacy in education underlines the importance of children and youth learning about AI so that they may be critically informed, and it also speaks to the need to build teacher knowledge capacity and parental awareness. As an extension of digital literacy, AI literacy refers to the “knowledge [of] basic AI concepts and data literacy, [including] skills such as basic AI programming, [as well as the] attitudes and values to understand the ethics of AI” (UNICEF, 2020). This suggests the importance of integrating AI literacy into mandated school curricula, a process that can often take years. Teachers’ well-being includes attending to workloads, allocating time for ongoing professional development and lesson preparation, and technological unemployment due to AI. AI and other digital technologies change teacher practices, including how student-teacher relations are convened and developed, sometimes with unintended, potentially negative consequences. The ethical implications of the findings in this table suggest that new methods for bringing greater awareness to the ways that AI shapes education are needed.

Posthumanist Ethics and the Work of AI Artists

Artists whose work involves the influence of AI on society can expand the knowledge base of teachers and raise awareness about ethical concerns through alternative visual and creative means. Such art projects can help teachers and students develop awareness of the ethics involved with AI. AI artists and art educators practice at the intersection of public perception and technological innovation. We look to AI artists to provide evidence of creative interactions and tensions with respect to AI to address the educational provision required to respond to new human-AI competencies and ethical frameworks.

Artists have expanded the debate over AI ethics on many fronts and provided alternative narratives, from social justice issues to data privacy and security practices. Luke Stark and Kate Crawford (2019) interviewed thirty-three artists on their approach to AI ethics and social tensions

related to the use of big data and artistic creation. They identified artists' shared preoccupation with the political economy of data, their discomfort with the normalization of surveillance, and their evolving role in the interpretation and approach to art. Other researchers (e.g., Audry & Ippolito, 2019; Hong & Curran, 2019) have contemplated the question of artists' roles now that AI machines are becoming increasingly capable of generating novel works of art.

Ethical concerns related to algorithmic cultural and racial bias and the negotiation of conflicting values within technology regulation are two issues offered for consideration. Highlighted are artists whose creative posthuman research in AI positions them as leaders in these debates: Sarah Newman and Stephanie Dinkins. It must be noted that there are many more AI artists whose work demonstrates innovation and the ability to address ethical concerns.¹ These two artists were chosen to sample the variety of creative responses that are possible when working with AI. Furthermore, they are highly effective pedagogues, with the ability to articulate the ethical consequences of their targeted issues.

Sarah Newman (2020a) focuses on the nature of agency as fleeting, emergent, and contingent in the mutable entanglement of human-AI relations. Key to her work is the ethical problem of negotiating multiple and often conflicting values about AI. Through her creative workshops, she ponders the broad range of values people hold with respect to their digital relationships. As director of art and education at Harvard's meta-LAB, Newman works at the intersections of education, art, and AI. Her interactive installation *Moral Labyrinth* is a gallery exhibition with an online community presence that is integral to the piece (Newman, 2020b). To develop the labyrinth in the gallery, participants are invited to go online and ask questions about AI. These queries are integrated into the physical space, and the labyrinth builds. This combination of a shifting gallery exhibition contingent upon input that is available to everyone online is a structure that highlights the embodied and extended nature of human-AI relations. It also mirrors a way through siloed, personal values by combining all comments together in—appropriately configured—a labyrinth. This piece establishes a democratic, creative, and educative opportunity for people to consider their own and others' values with respect to AI in their lives.

¹ See, for example, <https://AIArtists.org>

As Newman (2020a) remarks,

Moral Labyrinth is an interactive art installation that ... is a meditation on perennial—and now particularly pressing—aspects of being human. Engaging with the difficult task of aligning values, it gently reveals the gravity of the problem, and creates an open space to reflect on questions. (para. 3)

More recently, the metaphor of the labyrinth has morphed into that of a knot (see Newman, 2020b). This version of the ongoing project takes into account the events of 2020, with emphasis on the COVID-19 pandemic, and the deep divisions within the US populace. The knot is an effective metaphor for the conflicting values exacerbated by current global uncertainty and fear. The computer screen acts as a 3D space, and the curious result is movement reminiscent of an imagined algorithm scanning and gaining snippets of data. The problem of negotiating contrasting values within the populace, while not new, takes greater ethical consideration because of how exposure to alternative worldviews is algorithmically curtailed online (see Schmeiser, 2017). Newman's labyrinth and knot are telling in this regard.

In the second example, the work of AI artist Stephanie Dinkins (n.d.) questions algorithmic cultural bias. Through her creative process, Dinkins shares her emergent understanding of the ways that AI can better include the underrepresented within the technology sector and society in general. Her work stems from the

worry that A.I. development—which is reliant on the privileges of whiteness, men and money—cannot produce an A.I.-mediated world of trust and compassion that serves the global majority in an equitable, inclusive, and accountable manner. People of color, in particular, can't afford to consume A.I. as mere algorithmic systems. Those creating A.I. must realize that systems that work for the betterment of people who are not at the table are good. And systems that collaborate with and hire those missing from the table—are even better. (“Five Artificial Intelligence Insiders,” 2018, para. 25)

Dinkins' work investigates the ways that AI could become more culturally inclusive. Her continuing project *Not the Only One (N²TOO)* focuses on the oral traditions of storytelling, a form of shared communication that is culturally specific. She has created an ML sculpture that converses with gallery participants. In this first iteration of the project, Dinkins (n.d.) notes that *N²TOO* is conversing at a two-year-old level. Dinkins (n.d.)

continues to document the development of this piece on her website so that her process of creation is transparent. In commenting on this project, she notes:

Here, storytelling, art, technology, and social engagement combine to create a new kind of artificially intelligent narrative form. This project works toward the creation of culturally-specific, natural language-based AI that reflects the goals of the communities making them. By centering oral history and creative storytelling methods, such as interactivity and verbal ingenuity, this project hopes to spark crucial conversations about AI and its impact on society, now and in the future. (Dinkins, [n.d.](#), para. 4)

Ethical engagement with issues of equitable cultural representation within AI development is vital. Dinkins' contribution is in the form of an artistic and coding experiment that is also an educational example of artistic AI methodology. Included in these recent explorations is the development of an avatar that is based upon the continued conversions that develop within the gallery space (Dinkins, [n.d.](#)). Boundaries shift among avatar, artist, storytelling, and gallery participants through conversations with *N'TOO*, as data creates iterations that bring into being culturally sensitive AI possibilities.

IMPLICATIONS FOR ART EDUCATION

It is essential that children, youth, parents, and teachers develop ethical sensitivity to the complexities of technology-mediated educational practices that can extend from art to other areas. As is evident from these two artists' commentaries, the proliferation of AI artistic experimentation as public pedagogy can support this aim. The creative AI practices of artists can enrich school art practices, providing art educators with opportunities to impress upon students the importance of being informed so that they might influence policymakers in the future, as more AI infiltrates society.

Art education research has a robust history of investigating the effects of technology on creating and learning. For over twenty years, scholars have been calling for equal access to technology (Congdon, [1997](#)), greater cultural representation within/or in using technology (Bae-Dimitriadis, [2020](#); Suarez, [2000](#)), and limitations with respect to privacy and control (Chung, [2010](#); jagodzinski, [2015](#)), to name only a few of the many issues of ethical concern. Although the contemporary context has expanded to include complex online environments, many problems have continued to

emerge and flourish since the early nascent critiques into the inequities and ethical dilemmas around technology in the art classroom. With respect to privacy, for example, Duncum (2015) suggests that all art educators can do is remind students of the trade-off that is part of creative collaboration online, whereby their data is collected in return for their use of the media. What is evident from our present research and these two artists' investigations is that much more work on AI in the art classroom and in the greater public realm is required.

Much of AI art is limited to simple, aesthetic manipulation of images, with little to offer on human-AI relations and other social issues. This kind of instrumentalism does much to entertain but little to educate. Granted, the manipulation of images using ML algorithms such as generative adversarial networks (GANs; see Baraniuk, 2017) is one entry point into AI art for school-based art programs. However, without an awareness of AI issues, attitudes, and biases, preparing the next generation for the challenges of AI-human relations is significantly inhibited—AI art should be coupled with ethical questions that encompass a global reach.

In this vein, scholars call for underlying theoretical shifts to support AI-related pedagogy that values a critical posthuman process. As Alyssa Niccolini and Nancy Lesko (2018) poetically muse, “If algorithms fatten as they learn from our varied textures, what might happen if we look into their textures and touch back?” (p. 632). In one instance of “touching back” through a model that focuses on GPS, movement, and mobile devices, Karen Keifer-Boyd et al. (2018) theorize how art educators might consider a human-AI entanglement. Coined as “posthuman movement art pedagogy” (Keifer-Boyd et al., 2018, p. 25), this theory addresses the nature and quality of shared agency within the GPS-human encounter. Key to this shift is the way that the human-AI relationship has moved far beyond a user-tool relationship.

Nicholas Leonard (2020) reimagines art pedagogy toward “entanglement art education” (p. 23) to highlight this theoretical shift of subjectivity into posthumanism. In an attempt to operationalize posthumanism within the classroom and within aesthetics, the necessary inclusion of non-human creative actions as emergent with human creative activities opens possibilities for students and teachers to think deeply about their subjectivity with respect to their technology. As Aaron Knochel (2016) writes, “visual technologies need not be assessed simply as the hardware of socio-logical determinism and technique mastery, but as the *software of social practice*: unbounded, relational, and heterogeneous to the impacts of

learning and the performances of pedagogy” (pp. 72–73, italics in original). The move toward posthuman perspectives for art teachers can align with a greater prominence of AI art in school art curricula, so that the nature of “co-figured agency” (Keifer-Boyd et al., 2018, p. 25), which describes the enmeshment of human-AI, is broadly enacted. In order to prepare the upcoming generation to endorse more inclusive, responsible, and ethical AI global development, posthumanist and decolonialist framings should be taught and integrated in conjunction with new media art practices and through exposure to more AI artists.

CONCLUSION

Human-AI relations will continue to develop, morph, and evolve at accelerated rates; ethical challenges will multiply and solutions to these challenges may not keep up with these changes. Renegotiated (inter) subjectivities are emerging in the midst of new human-nonhuman assemblages, hybridities, and fluid reconfigurations. AI art has the potential to support the navigation of shifting ontological grounds. Meanwhile, AI policies continue to advance on a global scale across private and public institutions. Humanist instrumentalism within policymaking can and should be expanded to include posthuman approaches to understanding human-AI relations. Posthuman perspectives can be mobilized through leveraging the educative potential of AI art.

In this chapter, we identified two artists whose work critiques and confronts new ethical issues concerning AI-human entanglements. The art of Newman and Dinkins directs attention to the negotiations of conflicting values and the inequities of cultural representation in AI. Such artists can speak to current global AI ethics policies and be part of the discourse on school art and public art. The opportunity to think differently about our human-digital selves is here: AI art has the potential to contribute to notions of truth, democracy, and intelligence, which will continue to be reinscribed upon future ontologies.

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PART III

Engaging Difference in Global Media
Arts: Cultural Diversity and
Empowerment



Decoding Stereotypes in Child-Oriented Media toward LGBTQ+: Preservice Art Teachers' Perspectives

Kevin Hsieh and Meng-jung Yang

Many of our students learn about LGBTQ+¹ issues indirectly. Rather than from interacting with LGBTQ+ people or from their schools or parents, they absorb messages from different media such as television, fashion magazines, advertisements (Chung, 2007), or even magazines that are specifically published for LGBTQ+ people (Hsieh, 2016). Cognitive

¹In this chapter, we use LGBTQ+ as an acronym to describe Lesbian, Gay, Bisexual, Transgender, Transexual, Queer, Questioning, Intersex, Ally, Asexual, and Pansexual (LGBTTQQAAP) people and communities.

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psychology has explained that individuals use past experiences and learned knowledge to process or make sense of new information (Coxon, 2012) and visual image schema (Lakoff & Johnson, 1980). The images shown in magazines published by local LGBTQ+ communities could “mis-represent the visual culture related to LGBTQ[+] populations” and “might unintentionally promote biases toward the LGBTQ[+] community or reinforce stereotypes” (Hsieh, 2016, p. 123). In addition, media arts such as visual images (Han & Handrick, 2010) and children’s full-length animated films that have used a gender transgression approach—such as queering the characteristics of characters as chaotic, deviant, and villainous—play a role in “limiting and reinforcing heteronormative gender roles and promoting negative associations about [LGBTQ+ people]” (Li-Vollmer & LaPointe, 2003, p. 89).

Acquainting preservice art teachers with pedagogies for incorporating lessons on guiding their students to critically examine, decode, and deconstruct stereotypes embedded in media is essential to training in media arts and art education. In co-author Kevin Hsieh’s (2016) survey of 146 preservice art teachers in an urban college in the southeastern US, all the study participants were found to be willing and ready to incorporate LGBTQ+ issues into their teaching so that they could help kindergarten to grade 12 (K-12) learners² to “reduce prejudice, stereotypes, discrimination, harassment, and bullying” in the classrooms (p. 125). Yet while they were willing, they lacked the requisite knowledge for implementation. Thus, we sought to determine where those knowledge gaps existed.

In late 2019, we implemented a cartoon character design project with twenty-nine preservice art teachers after we introduced filmmakers’ approaches to producing animated films that include queer-coding,³ queer-baiting,⁴ and queer characters. After collecting twenty-nine cartoon characters designed by the teachers, we found that no participant had

²In the US education system, K-12 includes kindergarten, elementary/primary, and secondary (middle/junior high schools and four-year high school/senior high school) education (National Center for Education Statistics, 2011, Fig. 13.1).

³Queer-coding means characters, relationships, or dynamics that are associated with queerness in media, which may be created intentionally or unintentionally as well as positively or negatively.

⁴Queer-baiting is a scheme for attracting and entertaining audiences by insinuating homoerotic scenarios as a deliberate arrangement that exploits queer codes to attract queer audiences. While it entertains non-queer consumers, it never intends to actualize homosexual relationships on screen.

designed an LGBTQ+ character and most characters showed no specific gender attributes. We wondered why they tended to avoid addressing specific gender attributes or simply chose objects or animals as the inspirations for their designs. We conducted this study to investigate this question further.

LITERATURE REVIEW

Media Literacy

Individuals living in many countries have become increasingly dependent on visuals and their capacity to communicate instantly and broadly. The explosion of visual images leads to the issue of visual consumption, which has been broadly discussed in educational research (e.g., Chung & Kirby, 2009; Giroux & Pollock, 2010; Schroeder, 2002). Aside from analyzing viewers' behaviors of consuming images, researchers and educators have pointed out that cultivating students' media literacy is now imperative because visual media has become an inseparable part of students' everyday lives (Metros, 2008). Media literacy indicates an individual's ability to access, analyze, evaluate, and transmit various media contents (Aufderheide, 1993). Media literacy aligns with the concept of visual culture in art education, which emphasizes visual spectacle and its representation, interpretation, manipulation, and construction (Freedman, 2003). As visual messages influence an individual's decision-making and shape their self-concept, incorporating media literacy in media arts curricula is of utmost significance for educators and educational institutions. For instance, Maria José Borges et al. (2009) state that integrating media literacy into a visual art class is an appropriate and effective approach that helps students develop critical thinking/understanding and activates participation through visual message interpretation. Moreover, scholars have called for greater attention to and prioritization of developing preservice teachers' media literacy to cope with the challenges within rapidly changing visual and media-saturated societies (Çelik et al., 2018; Gretter & Yadav, 2018; Yavuz-Konokman, 2020).

As one of the most significant issues in education, identity formation is also an important aspect of the visual culture in the art curriculum (Freedman, 2003). Individuals consume the characteristics of visual representations from media arts, and consciously or unconsciously internalize those representations as a description of themselves or others. For

example, Meredith Li-Vollmer and Mark LaPointe (2003) claim that the media impacts our understanding and reaction to concepts of gender, sexuality, and transgression. Children may adopt gender norms and representations from the media to form their own identities. Additionally, studies on the effects of media exposure suggest media consumption can lead to unrealistic perceptions of gender roles and race (Bergstrom et al., 2018). To confront the challenges that come with visual consumption, teachers should proactively utilize various forms of media in approaches to teaching content, and foster students to become critical consumers who actively engage in creating new forms of media representation (Metros, 2008). As Sheng Kuan Chung (2007) suggests, “media literacy art education offers art teachers and their students an opportunity to nurture their aesthetic sensibilities, social awareness ... to resist and challenge prejudiced, dehumanized or unjust social practices” (p. 98). In other words, incorporating media literacy into art curricula can empower students to become critical and autonomous thinkers who can proactively promote social justice issues, advocate for systemic change, and challenge the systems that produce media messages (Bergstrom et al., 2018).

Explicitly incorporating media literacy exposes preservice teachers to issues of inaccurate and stereotypical depictions of minority groups, including sexual minorities, in media and further demonstrates the need for approaches to analyzing and critiquing media messages that impact their future classrooms. Sarah Gretter and Aman Yadav’s (2018) research reveals that insufficient media literacy interventions during preservice training have resulted in preservice teachers’ lack of confidence about teaching media literacy to their future students. Research on media literacy interventions shows that college-aged participants are more likely to understand the impact of unrealistic media portrayals of minority groups (Bergstrom et al., 2018). Those stereotypes of minority groups are circulated on social media and can result in cyberbullying. Robyn Cooper and Warren Blumenfeld’s (2012) research indicates that LGBTQ+ and allied youth are often targeted recipients of cyberbullying; indeed, 48.7 percent of LGBTQ students have experienced electronic harassment (Kosciw et al., 2018). Although social media usage comes with risks such as cyberbullying (Livingstone & Brake, 2010), it also brings opportunities for youth. For instance, Shelley Craig et al. (2015) point out that the increase in the representation of the LGBTQ+ community and LGBTQ+ role models may positively influence LGBTQ+ youths’ identity formation.

Also, LGBTQ+ youth can share advice and support with peers and allies through social media.

In addition to gaining a critical lens to analyze media messages, another crucial task of media literacy intervention is to empower students to engage as active participants who advocate for social justice. Compared to traditional offline sources of media (e.g., television), new online media (e.g., social media) allows LGBTQ+ youth to have greater access to a diversity of LGBTQ+ representation (Craig et al., 2015). In addition, social media enhances social emotional learning, such as identity, friendship, expression, empathy, and activism (Török-Ágoston, 2017). Much research shows that media, especially social media (e.g., YouTube, Facebook, Instagram, and Tumblr), empowers LGBTQ+ youth to feel stronger through positive and resilient representations (e.g., Castro, 2012; Craig et al., 2015; Hobbs, 2019; Lucero, 2017; Shin, 2016).

Social media forums provide an outlet for the LGBTQ+ community to produce, distribute, and reproduce images and stories of themselves. When LGBTQ+ youth actively participate, interact, and communicate with each other on social media, it not only changes how they consume and produce information (Shin, 2016), but can also foster LGBTQ+ youth communities. Furthermore, Leanna Lucero's (2017) research shows that LGBTQ+ youth prefer to use social media to explore and express their gender and sexual identity over face-to-face settings. In other words, because social media has become the dominant source from which youth receive information (Lucero, 2017), educators should encourage students to utilize media as a vehicle to empower themselves, stand up for others, and find community. As Rebecka Török-Ágoston (2017) claims, the mechanism of social media is more interactive and complex than traditional mass media and has changed the educational endeavor of media literacy. The mechanism of social media and how individuals produce, circulate, consume, and reproduce visual representation may enlighten a new aspect of media literacy in an ocular-centric social media era.

Queer Representation: Queer Main-Text and Queer Subtext

Children are immersed in a visually rich environment where media circulate and distribute representations of cultural groups. While children and youth are developing their sense of others, they will likely misconceptualize LGBTQ+ people if they are constantly exposed to stereotypical representations of the LGBTQ+ community (Chung, 2007; Gomillion &

Giuliano, 2011). Gender identity is established and sustained by circulated ideology and visual representation, which is socially constructed and performed; schemas of gender, sexuality, and sex interact with and constitute one another, and continually portray themselves into a norm (Butler, 1990, 1993). Research shows that the hidden message of patriarchal, heteronormative norms from child-oriented media (e.g., film, cartoons, animations) can shape how children portray themselves and perceive others (Li-Vollmer & LaPointe, 2003). This phenomenon raises concerns regarding how media might indoctrinate children into overgeneralized, or sometimes even negative, queer representations, such as demonized queer villains or queer victims (Li-Vollmer & LaPointe, 2003). Because children are susceptible to social messages from media arts, they might unconsciously internalize stereotypical gender-related messages, which construct their social identity and impact their performance of gender.

Under a heterosexual-dominated atmosphere, the lack of diverse and positive queer representation makes LGBTQ+ children and youth even more vulnerable. Without sufficient resources about LGBTQ+ in schools (Greteman, 2019; Kosciw et al., 2018), and without positive queer representations in the media (Li-Vollmer & LaPointe, 2003), hostile and discriminating media environments make LGBTQ+ identity development extremely difficult for queer youth. To confront these challenges, Craig et al. (2015) suggest that increasing the representation of LGBTQ+ people in media may positively foster identity formation and inclusiveness. Also, social media allows LGBTQ+ youth access to diverse gender representations that can reduce the impact of stereotypical queer representations in traditional media (Craig et al., 2015). In the Global Education 2030 Agenda, the United Nations Educational, Scientific and Cultural Organization (UNESCO) adopts seventeen Sustainable Development Goals (SDGs) for eradicating global poverty. SDG 4 aims to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (UNESCO, 2017, p. 18). This clearly points out the importance of human rights, diversity, and inclusion in education.

Queer representations in media have the potential to foster self-esteem and well-being in LGBTQ+ youth as well as to encourage their critical thinking abilities (Craig et al., 2015). Sheng Kuan Chung (2007) suggests using LGBTQ+ stereotypes in the media to examine explicit and implicit messages that refer to the issue of heteronormative values to nurture individuals’ social awareness and resist and challenge prejudiced and stereotyped social issues. Positive queer representations in media not only make

the LGBTQ+ community visible, but also offer potential role models and promote tolerance. Negative queer representations can also be used as examples for metacognitive analysis and critical content analysis in class, which could extend to cultivating critical thinking abilities, inclusiveness, and empathy. Li-Vollmer and LaPointe (2003) claim that educators should take queerness as a curricular perspective to contribute to a broader conversation about gender and sexuality roles. Through practices of revealing problematic representation and its hidden messages and producing diverse representations, students may become critical viewers and visual activists. Furthermore, analyzing and identifying queer representations in media allows audiences to lay bare prejudices and opens conversations of queer discourse in the media arts and art classroom (Yang & Hsieh, 2020).

Queer representation in media can be categorized into queer main-text and queer subtext (Yang & Hsieh, 2020). Queer main-text refers to the characters who are explicitly presented as queer; queer subtext refers to characteristics and messages in the form of signs that insinuate queerness (Yang & Hsieh, 2020). Queer subtext can be further divided into two subcategories: queer-coding and queer-baiting. Characters, relationships, or dynamics in media that are associated with queer are queer-coding, regardless of whether those codes are created intentionally or unintentionally. Although queer codes can be positive or negative, most queer codes in media tend to be negatively presented (Halperin, 2012; Li-Vollmer & LaPointe, 2003; Mallan & McGillis, 2005). For example, Li-Vollmer and LaPointe's (2003) analysis of villains in ten full-length animated movies uncovered a pattern of negative queer representation that reinforced heteronormative gender roles, such as the gender performances of male villains expressing stereotypically feminine qualities. Aside from queer-coding, queer-baiting is a tactic that aims to attract and entertain queer and non-queer audiences by insinuating homoerotic scenarios as a deliberate arrangement (Yang & Hsieh, 2020). Joseph Brennan (2018) criticizes queer-baiting for reinforcing negative connotations about queer by treating queer characters as a tool for entertainment.

Young audiences, especially LGBTQ+ children, may be more vulnerable to the implicit messages in queer subtexts because they are drawn to social media that is dominated by heteronormative messages while they are exploring their gender identity and developing media literacy. Therefore, it is imperative to cultivate students' viewing sensibilities and encourage diverse conversations and creations about queer representation in education.

STUDY DESIGN AND RESEARCH METHODS

We developed the cartoon character design project for our preservice art teachers to explore different media arts as instructional resources and then investigate how to incorporate media arts into their teaching practices to enhance students' learnings about the LGBTQ+ issues.

Participants

There were thirty-five participants for this study, all of whom had been accepted into the art education teacher-education program at an urban university in the southeastern US (n=35), including sixteen undergraduates (45.7%) and nineteen graduate students (54.3%, Master of Arts in Teaching). Fifteen of the graduate students held provisional teaching certifications⁵ and were working toward being certified as K-12 visual art teachers. We conducted this study in spring 2020 when participants were enrolled in an art education methods course called Visual Presentation and Instructional Technology. We used their initials for quotations in this study.

Design of the Project

We describe the five segments for this cartoon character design project below. Participants spent four hours of class time to complete the design of their cartoon character.

Initial Viewing (Selecting Films and Media)

With some foreknowledge of media literacy approaches and LGBTQ+ topics, participants viewed animated clips. We chose Disney films for this project because our participants were familiar with them. The preselected clips and characters included *Aladdin* (Genie and Jafar; 1992), *Beauty and the Beast* (Cogsworth and Lumiere; 1991), *Frozen* (Oaken; 2013), *Hercules* (Hades; 1997), *The Little Mermaid* (Ursula; 1989), *Mulan* (Li Shang; 1998), *Pocahontas* (Ratcliffe; 1995), *The Lion King* (Scar, Timon, and Pumbaa; 1994), and *Wreck-It Ralph* (Felix and King Candy; 2012).

⁵The provisional teaching certification in Georgia is a temporary teaching certification provided to candidates who do not have official teaching certifications. The provisional teachers have a period of time, usually up to three years, to obtain an official teaching certification before their provisional certification expires.

Participants freely discussed the clips with each other and expressed their thoughts during the viewing segment of the project. We did not intervene in their conversations during this segment and only took notes based on our observations.

Introducing Approaches to Queering Art Education

After showing the clips, we introduced approaches used by filmmakers to produce animated films, including queer-coding and queer-baiting. Participants then specified several parts of the clips that corresponded with these approaches to demonstrate their understanding.

Group Discussion with Prompts

We randomly divided the participants into seven groups of five and had each group leader draw a card with the title of a particular animated film on it. Participants were then instructed to discuss their film with regard to three guiding questions: What approaches were used in this particular film? What stereotypes toward LGBTQ+ people were embedded or misrepresented in the film? And how would you guide your students to decode/deconstruct these stereotypes in animated films? Conversations could, of course, expand beyond these questions if time permitted.

Creating a Cartoon Character

After the group discussion, each participant designed and created a cartoon character. We encouraged participants to use any materials and medium for their design as long as the character was in a human form. This was mainly to prevent them from avoiding the use of any gender attributes, based on our experience with most participants in our previous project in late 2019. Therefore, this new requirement was introduced to encourage participants to navigate deeper in terms of stereotypes toward or misrepresentations of LGBTQ+ people. Participants were also allowed to use their imaginations to freely design their characters, such as appearances, outfits, accessories, gadgets, or superpowers.

Individual Reflection on the Designed Character

We asked participants to write down their inspirations, rationales, and descriptions about their designs. Participants also explained how they would incorporate the design project into their teaching. We then collected the images of the characters with statements and analyzed the data for this study. In addition, we conducted informal interviews with

thirty-three participants to seek clarifications about their designs. We used email to communicate with two participants after the switch from in-person to virtual classes due to the pandemic in late March 2020.

Research Methods

Using a mixed-method research design, we collected both qualitative and quantitative data for this project. There were thirty-five cartoon characters with narrative descriptions about the design and notes from our observations, as well as interviews collected for the content analysis. As Stokrocki (1997) explains, “content analysis is used in discovering concepts (abstract ideas) and themes” (p. 41). After analyzing the thirty-five cartoon characters and design statements, we discuss our findings in terms of four categories: challenging binary categorization and misrepresentations, practicing critical and divergent thinking, designing and teaching an inclusive art curriculum, and becoming allies and advocating for equality and diversity.

DISCUSSION

Challenging Binary Categorization and Misrepresentations

A binary categorization of gender could unintentionally reinforce gender stereotypes and “potentially marginalize those who do not share the common gender attributes or who do not conform” (Hsieh & Yang, 2021, p. 372). May Ling Halim et al. (2017) explain that biased gender attitudes can “perpetuate gender segregation which may result in increased gender stereotyping and gender-stereotypical behavior” (p. 882).

During the project, we observed participants facing challenges designing the appearances and outfits for their characters after learning about queer-coding, queer-baiting, and gay character approaches because they were trying to break the gender binary and avoid LGBTQ+ stereotypes. One participant explained that “after learning about queer coding and [queer] baiting, I understood the intention behind what was occurring when I would watch a TV show and pick up on cues that caused me to guess a character’s sexual orientation or gender identity—I felt both guilty and manipulated,” and the “cues I would try to decipher included voice tone, mannerisms, clothing/hairstyle, and scenes of what appeared as sexual tension between characters of the same sex—all while subconsciously

playing into learned stereotypes” (MP, personal communication, October 15, 2020). Through limiting our participants to designing a human cartoon character and not an object or animal, we compelled them to think carefully about how to avoid the reinforcement of misrepresentations or stereotypes of LGBTQ+ people in their character design.

MP’s character was a silhouette format of a person with no gender attributes, which challenges binary categorization (see Fig. 13.1). She explained:

The silhouette format also supports the idea that outward appearance should not be relied upon when it comes to learning about an individual, outward appearances and details often being used to form stereotypes. The paint palette brain has multiple colors as a subtle connection to the pride flag, but more importantly, the flag’s represented concept of diversity. (MP, personal communication, October 15, 2020)

Fig. 13.1 MP’s character is in a human silhouette form with both common art imagery and art concepts. It creates an element of anonymity and universality.



Practicing Critical and Divergent Thinking

During the small group discussion portion of the project, participants shared other media and films containing misrepresentations of LGBTQ+ people. They discussed what queer-coding and queer-baiting approaches were used in the media and film production, as well as what processes they would use to decode these hidden misrepresentations or stereotypes. We challenged participants to reevaluate their existing perceptions and attitudes in terms of promoting diversity and inclusion, even if they thought they were very open and inclusive.

We asked them questions such as why they never thought about designing a queer character, and JM (personal communication, October 20, 2020) responded:

Before this project, I never thought of making a queer character. As a Black woman, representation has always been important to me, so I would always try to be diverse when it comes to skin tone and race. On the other hand, it never dawned on me to create a gay [queer] character or think of what a gay [queer] character would look like.

The small group discussion and investigation not only invited our participants to question the hidden misrepresentations of LGBTQ+ people and decode stereotypes embedded in different films (Freire & McCarthy, 2014), but also prompted them to think critically. BV (personal communication, October 13, 2020) said, “growing up, I never noticed [the] cultural pervasiveness [of what we call the villain-as-sissy archetype in animations and movie produced by film studios], and recently, I have started to notice these tendencies in Disney movies.” JM (personal communication, October 20, 2020) further explained:

Many times, the media portrays an LGBTQ+ male or woman in a specific way. These representations can enforce negative stereotypes by creating the impression that all gay men or women act or look a certain way. The media also tends to enforce gender on things like cartoons and animal characters. By making the character have a stereotypical personality or appearance because of its gender, race, or sexual orientation, these negative stereotypes are exposed to the person or child watching them.

Critically reexamining one’s comfort zone with visual experiences might have been a challenging task for the participants. Still, this

experience activated their awareness and sensibility concerning how stereotypes and misrepresentations are formed and used through the mechanism of visual consumption.

By relating their artworks and reflections with their experiences and the issues they care about, the participants critically articulated that stereotypes can influence all groups and communities, and no one is exempt from the influences of such social phenomena.

Designing and Teaching an Inclusive Art Curriculum

All participants agreed that developing LGBTQ+ inclusive curricula or lessons is important, and they are planning to implement anti-bullying or harassment-free policies in their future classrooms. Through the processes of film viewing and character design, participants answered why and how they would implement the design into their future teaching. MP (personal communication, October 15, 2020) explained that she would like to adopt this character design project in her future teaching because it will “help students to recognize [their] internalized stereotypes that they unknowingly incorporated into their character and which ones they consciously avoided.” In MP’s work, she did not specifically indicate her character was a gay character, but she did include a common LGBTQ+ symbol in her character design (see Fig. 13.2):

This paint palette also helps to support visibility of this world symbol (the pride flag), even if in a disguised and indirect way. The greyscale image background within the outline of the head relates to the concept of stereotyping and how it as a tendency promotes an oversimplifying “black and white” and “this or that” classification mindset. Rather, individuals exist on a spectrum—there are infinite ways of being and living, just like a greyscale with its many tones and shift[s] in value. (MP, personal communication, October 15, 2020)

Becoming Allies and Advocating for Equality and Diversity

Hsieh (2016) points out that an art classroom can be a safe space for all students to freely express themselves, especially LGBTQ+ students. Art teachers also play an important role in promoting equality for all learners through teaching LGBTQ+ inclusive lessons or helping students to develop discussion groups. Hsieh (2016) further explains, “with the

Fig. 13.2 “Seeing a character in pink and purple spandex with a rainbow afro might help those queer students feel like they have a character they can look to who is queer but also emits strength, intelligence, and respect” (XJ, personal communication, October 25, 2020).



development of such groups, LGBTQ+ students would have a welcoming space.... more importantly, small groups will become self-efficacy advocates and lobby the school administration to prevent bullying and harassment at school” (p. 131). We encouraged our participants to develop LGBTQ+ inclusive lessons (programming) and decode the different misrepresentations/stereotypes of LGBTQ+ people embedded in media (intervention) as a response to the misuses of queer-coding and queer-baiting monopoly. JM (personal communication, October 20, 2020) wrote:

We must be mindful of the harmful programming we are forcing on our students at such a young age. Explaining to them how everyone is unique and there is no right or wrong way to act or dress will be critical in helping break these stereotypes in the future.

MP (personal communication, October 15, 2020) described how she would implement her character design (see Fig. 13.2) into her classroom teaching in a conservative school environment.

I would plan to place [my] character in different parts of the classroom—for example, the character stating the class expectations in a speech bubble as a wall display. I might also include small images of the character in lesson PowerPoint presentations and handouts, perhaps in an “I Spy” or “Where’s Waldo” fashion as little reminders of the concepts it represents. With regard to teaching in conservative schools, I designed the character with this in mind. The character at first just appears as a human head with a paint palette brain (totally expected imagery for any art classroom). I think my character’s power within a conservative setting lies within this intentional quality of discrep[an]cy: visibility despite subtlety.

In another example, XJ’s character, Rainbow Ross (Fig. 13.2), was inspired by football player/activist Colin Kaepernick and featured symbols of supporting LGBTQ+, diversity, and inclusion. XJ (personal communication, October 25, 2020) explained, “I took a more masculine pop culture icon and sprinkled in some gay sparkles to introduce to children that queerness can be exciting and powerful and to start rewiring our anti-gay upbringings.”

While all thirty-five participants acknowledged the importance of including LGBTQ+ issues in their future teaching, at least three participants expressed their concerns if they were teaching in a more rural or conservative school. From MP’s and XJ’s examples, we observed the strategies that our participants used also reflected this concern. MP decided to design her character with gender markers to great abstraction to encode gender neutrality, whereas XJ’s approach was much more about provoking controversy to catalyze a conversation in her teaching practices.

During the project, we encouraged our participants to make sure their future classrooms are bullying-free if they are teaching in conservative schools. Through building on a safe and bullying-free learning space, they could gradually promote LGBTQ+ equality in their classrooms or beyond. The processes of decoding misrepresentations and stereotypes in the media could be an effective approach for art teachers to teach media literacy and critical thinking.

LIMITATIONS, RECOMMENDATIONS, AND OPPORTUNITIES

There are two limitations of this study. First, the thirty-five participants were from urban and metropolitan areas, which might not reflect the perceptions and attitudes toward LGBTQ+ topics of those preservice art teachers who are from rural areas or with different demographic backgrounds. Modifications of the project might be needed for teachers from such areas or conservative schools. For instance, starting with a classroom guardian design could be an option—art teachers could develop a lesson on it and emphasize the protection of all students from bullying and harassment of any form. Yang and Hsieh (2020) suggest teachers could incorporate LGBTQ+ content as it relates to social justice, bullying, self-identity, stereotypes, empathy, or diversity.

Secondly, participants' character designs were submitted right before the university shut down due to the COVID-19 pandemic. Participants did not have the chance to share their designs with the class for post-design discussions or classroom implementations. We do believe that participants would have shared and gained more practical strategies in terms of classroom implementations. We suggest that a follow-up discussion could be very beneficial for participants to learn from each other. Utilizing online collaborative applications such as VoiceThread or a Google Jamboard could be an alternative way for group critique or feedback exchange.

CONCLUSION

Students learn through seeing visual images and different media. Helping learners to decode hidden messages, misrepresentations, and stereotypes embedded within these images and media arts becomes critical in K-12 classrooms. It is our goal to educate future generations to be more critical in their thinking and more willing to stand up against social injustice. As Amelia Kraehe and David Herman (2020) emphasize, “we hope the field of art education will not ignore or half-heartedly participate in the most significant, potentially world-changing events of our time that just might move the country [the US] toward its unfulfilled promises of liberty and justice for all” (p. 7).

Integrating consumer media such as films, animations, movies, and cartoons into the teaching of the media arts and visual art curricula could have a positive long-ranging effect on our society. Developing and

teaching inclusive lessons that address diversity and equity is not just to inform preservice art teachers about the development of youth identities, especially identities and sometimes stereotypes toward certain groups of people such as LGBTQ+, but also to help educate students to value individual differences. Last but not least, showing support of the LGBTQ+ community is as important as promoting the meaningful learning of learners. Art educators can be powerful allies of LGBTQ+ students in school. A rainbow sticker on the teacher's laptop or an equity logo on the teacher's sketchbook can be a quiet yet powerful tool for showing support of the LGBTQ+ community.

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Creating Social Dialogues through a Media Arts Education Project in the Canary Islands

Noemí Peña Sánchez

This chapter presents an art educational experience developed with preservice teachers enrolled in the Grado de Maestro en Educación Primaria (Degree in Primary Education) at the Faculty of Education in Universidad de La Laguna (ULL) in Tenerife, one of the eight Canary Islands in Spain. Surrounded by the Atlantic Ocean, the islands are located close to the African continent, just one hundred kilometers from Morocco and Western Sahara. This geographical position makes the Canary Islands the gateway to Europe for migrants who hope to reach the shores by sailing across the ocean in a *cayuco*.¹ According to a study published by the Ombudsman (Defensor del Pueblo, 2021),² the Canary Islands set a new record for the arrival of migrants in 2020, and this upward trend has led

¹ This is a type of flat-bottomed boat hollowed out of a tree trunk. In 2006, the migratory situation was known as the “cayuco crisis.”

² The Ombudsman is known as *Defensor del Pueblo* (“public defender”) in Spanish.

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to a migration crisis similar to that of 2006, which has collapsed the islands' reception capacity. Issues such as life expectancy, climate change that forces the displacement of the population to avoid extreme poverty, and the current COVID-19 pandemic have had a significant impact on the migratory flows of the population toward Europe. Especially in the Canary Islands, this has become an everyday reality that does not go unnoticed in the landscape. From the educational context, it is necessary to make this crisis visible and work to raise awareness in order to promote the integration of migrants into society.

This initiative in art education is part of the educational innovation project "Art and Diversity in Primary Education," funded by ULL. Its general objectives are (1) to promote cultural diversity through art education, enhancing the vision of art for social change; (2) to create digital learning environments that promote the use of the English language and innovation in educational technologies; and (3) to encourage the use of mobile devices by combining mobile applications as tools for learning and artistic creation.

This initiative is one of the key actions of the above-mentioned innovative project that promotes an artistic education that goes beyond developing artistic skills and techniques with mobile devices. The vision of arts education aims to engage students with the social problems that are present in our environment. Ricard Huerta Ramón (2015) highlights the positive impact of dealing with these social issues that not long ago were forbidden on the streets and in the classroom. In fact, he states how art education can promote social change, considering that contemporary artistic practices, increasingly porous and participatory, are suitable for reflecting on the reality that surrounds us. This statement leads us to conceive art education as a practice committed to social reality, which scholars such as Dennis Atkinson and Paul Dash (2005) also emphasize: "Developing a critical understanding of the diversity and disparity of social existence through art practice has become an important pedagogical project for art education in the early twenty-first century" (p. xiii).

The ULL's art educational initiative was developed through visual media with two purposes in mind. First, it aimed to support the use of mobile devices in the classroom, working with alternative teaching methodologies (Peña Sánchez, 2019) while incorporating other visual media resources as creation tools. Second, it explores social issues based on art education and cultural diversity, inspired by many artists whose projects advocate for the diversity of cultural identities.

THE COMPETENCE-BASED ART EDUCATION CURRICULUM IN THE CANARY ISLANDS

The Spanish educational system, currently immersed in its latest legislative reform, *Ley Orgánica de Modificación de la LOE (LOMLOE; Jefatura del Estado, 2020)*,³ is based on a competence-based curriculum model introduced in 2006 for all educational levels. This model implies that the learning achieved is transferred to different contexts of reality and its complexity increases throughout the educational stages. Jacques Delors (1996) states the acquisition of a competence “enables people to deal with a variety of situations, often unforeseeable, and to work in teams, a feature to which educational methods do not at present pay enough attention” (p. 21), while Miguel Zabalza (2009) describes competence as a construct understood as the set of knowledge and skills that people need to develop some kind of activity: the ability to act effectively to achieve a goal (p. 8).

The seven competences (see Ministry of Education, Culture and Sports, 2015) of Primary, Secondary, and Baccalaureate Education in Spain play a fundamental role in the curricular design of each subject. The cross-curricular nature of the competences means that each subject contributes to the acquisition of different competences. Reviewing the Primary Education curriculum in the Canary Islands (Ministry of Education, Universities and Sustainability, 2014), art education, owing to its interdisciplinary nature, is one of the curricular subjects that most contributes to the development of competences.

The initiative is an innovative way to combine a cultural and creative education by fostering competency in cultural awareness and expression, social and civic communication, and learning to learn, as well as digital competence.

For competence in cultural awareness and expression, it is essential to take into consideration the creation of a cultural identity as a citizen who is aware of the variety of cultural practices that exist. Precisely from the cultural diversity approach, we intend to pay attention to those works that generally remain outside the conventional artistic circuits. In this sense, it is expected that students look critically at those visual images that are brought into the classroom. These artworks should be understood as cultural productions and make them think about the issues they are dealing

³LOMLOE is the most recent policy approved that has come into force gradually from 2020 to 2021 and will be fully implemented from 2023 to 2024.

with. Dennis Atkinson (2005) affirms how contemporary artists deal with issues such as social and cultural identities and human interrelationships, ranging from everyday practices to global political issues, while Fernando Hernández (2012) remarks that artists are increasingly linked to the culture of the media and affected by the problems of everyday life, which consequently connect with the reality that surrounds them.

Competence in social and civic communication promotes values such as tolerance and respect, and fostering equality and inclusion in society, thus avoiding discrimination based on gender, sexuality, race, or culture. Communicative skills are crucial for promoting reflection on attitudes and behaviors toward diversity through the use of different languages of expression. Creative processes, in contrast, foster motivation and help students to understand that mistakes are part of the learning process and strengthen it, which is part of the learning to learn competency.

Finally, digital competence is understood as a way of creation and communication through the use of technology, and it calls for a critical attitude toward what can be found on the internet. Technological resources in art education are becoming increasingly popular in the classroom because of the variety of creative tools available and their versatility for both learning and content sharing in networks.

Therefore, there is a normative intention to incorporate other visual and audiovisual media through digital tools for art education (Delacruz, 2009), but there is still some difficulty to go beyond developing specific skills for the mastery of the new technology. This means that the inclusion of digital tools alone is not enough to develop art practice if our educational objective is based only on the mastery of visual media technology. As Michael Butera (as cited in McGuire, 2012) argues:

Media should not supersede the art it is working within; rather, media becomes a part of the educational process within the art form. This description of media's function in the arts classroom marks its use not as content, but rather as a tool. (p. 120)

Having contextualized this project within the current educational framework in the Canary Islands, I will now describe an art and cultural diversity approach as a committed art education, which integrates the competences mentioned above.

ART AND DIVERSITY FOR AN ENGAGED ART EDUCATION

The goal of this project is to conceive an art education involved with the cultural and social reality that surrounds us, taking advantage of the possibilities of artistic practice as a way of exploring cultural identities. Many artists are concerned with social and cultural identities, such as Lula Gómez (2019) on gender, Evgen Bavcar (Peña Sánchez, 2014) and Judith Scott (Barrera & Peñafiel, 2006) on disability, and Angélica Daas (2016) and Kehinde Wiley (2020; Farago, 2020) on race and ethnicity. This shows an increasing interest in artistic practice focused on the sphere of social relations, where artists understand the collaboration and participation of communities as part of their creative process.

Contemporary artworks engaged with social justice issues often portray the realities of their time. Therefore, it seems appropriate for art education to echo and introduce educational initiatives that address social identity from both individual and collective experiences (Knochel & Selfe, 2012; Peña Sánchez & Noguera Ricardi, 2020). The development of an art education committed to art and diversity is based on a multicultural approach, understanding artworks as cultural productions that reflect this diversity of identities.

Following Imanol Aguirre (2009), cultural diversity in the arts is usually understood as a form of ethnic identity, far from everyday matters, when it is actually much more than that. It would be more appropriate to understand this cultural diversity from different artistic cultural productions that address issues of gender, sexuality, disability, race, and ethnicity. These issues inspire artists to connect identities with their work and at the same time with society. These cultural and artistic productions are also valuable for prompting educators to reflect on those issues and echo their concerns. Consequently, art education provides a committed vision of pluralistic society. As Patricia Stuhr (2003) states:

I consider art education to be a caring, social space where critical investigations of and through relevant cultural production can be facilitated by teachers to help students to inquire into the complexities and possibilities for understanding life and death in new ways. (p. 303)

These issues inspire artists to connect their work with the society we live in, but they also interest us as educators to reflect on them and echo this shared concern. Supporting this perspective in which to resituate our teaching practice, inspiring contributions from multicultural education

include those of James Banks (2010a, 2010b), Carl Grant and Christine Sleeter (2011), and Sonia Nieto (2004), as well as those related to art education by Imanol Aguirre (2009; publishing later as Imanol Aguirre Arriaga, 2013), F. Graeme Chalmers (2003), and Patricia L. Stuhr et al. (2008). According to Banks (2010b), multicultural education should provide students with “the knowledge, attitudes, and skills needed to function effectively in each cultural setting. They should also be competent to function within and across other microcultures in their society (...) and within the world community” (p. 8). It is a challenge for a knowledge that puts into play civic values and attitudes for social commitment and action.

In light of this statement, multicultural education is much more than integrating ethnicity or cultural content into disciplines. Multicultural education is a broader concept that encompasses five dimensions that promote its interdisciplinary approach in general education, as outlined by Banks (2010b): “(1) content integration, (2) the knowledge construction process, (3) prejudice reduction, (4) an equity pedagogy, and (5) an empowering school culture and social structure” (p. 20). Among them, the first, third, and fourth dimensions were emphasized in our project.

Starting with content integration, the project addressed dialogues about gender, disability, race, and ethnicity. In addition to artworks, visual artifacts are found as part of the existing visual culture and can also be considered cultural productions. As Aguirre (2009) mentioned, these artifacts represent cultural diversity because of the deep aesthetic meaning they hold with their cultural contexts. Nevertheless, one should be able to overcome that first step as an additive approach limited to introducing the culturally diverse into the curriculum, as seen in the multicultural education approach (Grant & Sleeter, 2011; Sleeter & Grant, 1987). In particular, the transformative approach (Banks, 2010a) “enables students to view concepts, issues, themes, and problems from several ethnic perspectives and points of view. The mainstream-centric perspective is one of only several perspectives from which problems, concepts, and issues are viewed” (p. 242). A good example is the inspiring initiative of the #firstdayfirstimage hashtag on Instagram, which illustrates how artist-educators are being asked to actively rethink the canons they create for their curricula, starting with the first image shown (Society for Photography Education, 2018). Overall, the emphasis is on debating viewpoints on the social and cultural identities of artistic productions. Banks (2010b) found these positive attitudes lead us to undo other negative ones, as well as the misunderstandings that lead us to the third dimension, prejudice reduction.

Finally, the dimension that concerns us the most is equity pedagogy, which involves readjusting educational practices to the diversity of identities by adapting our methodologies and resources to the needs of each identity. This equity pedagogy goes beyond what Grant and Sleeter (2011) described as teaching about exceptional and the cultural differences; rather, it means reviewing our own performance as educators, adapting it to the context in order to provide knowledge, values, and attitudes as a truly committed civic practice.

SETTING THE CONTEXT FOR AN ART EDUCATION PROJECT

As mentioned in the introduction, this art education initiative is part of a larger educational innovation project funded by ULL, which included activities in different undergraduate and graduate courses.

This project was developed with eighty-five undergraduate students in the Faculty of Education's mandatory course *Enseñanza y Aprendizaje de la Educación Plástica y Visual* (Teaching and Learning of Visual Art and Crafts Education), which is part of the bachelor's degree in Primary Education. It includes guest speakers who share art educational projects related to the cultural diversity approach, some artistic workshops developed over the semester, and the art education initiative that is the focus of this chapter. This project was originally planned for several weeks, which allows students to acquire a deeper understanding of art and diversity approach from theory to practice.

The project considers the characteristics of our students and is placed in the second half of the semester when the students have become more comfortable with the subject. Two aspects are also discussed. First, we experiment with different artistic languages incorporating mobile devices and the use of digital applications. The idea is to combine traditional artistic languages with those that use technological media, closer to their daily lives. Second, we broaden the concept of art to include a wide range of diverse cultural productions that deal with social issues that are real concerns in our society, which destabilizes the preconceived idea of art and demystifies the unique vision of the artist as an individual creative genius. Atkinson and Dash (2005) emphasize encouraging learners in art practice in order to understand themselves, others, and their social contexts. Therefore, revealing real concerns from artistic practice helps to empower students with critical and reflective insights into educational action through art.

CULTURAL IDENTITIES BEYOND STOP-MOTION MOVIES

The art education initiative involved several competencies that were described above. For the acquisition of digital competence, the use of mobile devices in the classroom as learning tools is encouraged. Although ULL provides an institutional virtual environment called Campus Virtual, the mobile application Seesaw Class⁴ is most commonly used because of its intuitive interface, similarity to a social network, and ability to facilitate synchronous and asynchronous interactions. Other applications designed as creative tools, such as the Stop Motion Studio app, are also used for the project.

The idea is to take advantage of the learning potential of such tools and integrate them into alternative digital scenarios for dynamic and more interactive learning actions between students and educators (Peña Sánchez, 2019). Academic culture cannot be detached from the culture outside the classroom, which is today hyper-connected to virtual reality. As Roberto Aparici and Marco Silva (2012) state, the new communication ecosystem proposes immediacy, acceleration, emotional shock, intuition, collaborative work, rapid interaction, the individual screen, and a form of group authorship (p. 57).

Obviously, there is a responsibility to reformulate artistic practices about how educators want to build knowledge in this new hybrid context. This new educational scenario promotes interactivity among participants, leaving behind the unidirectionality between educator and student and building on what Aparici and Silva (2012) defines as a “feed-feed” model.

Collaboration and cooperation during the learning process is essential. Students work in small groups to share their points of view and gain a better understanding of the topic. Inspired by equity pedagogy (Banks, 2010b), the way small groups were arranged had to reflect the cultural diversity we are committed to in the project, which means all members of the group need to be diverse in terms of gender, ability, or cultural background. This idea displaces the students from their comfort zones, as they have to work with those they are not used to working with.

The project was designed in several stages. Over the first stage, several art projects were shown to the whole class, such as the photographic project *Humanæ* by Angélica Daas,⁵ *A New Republic* by Kehinde Wiley,⁶ *Eres*

⁴ Seesaw Class is an educational program founded by Adrian Graham, Charles Lin, and Carl Sjogreen. See <https://app.seesaw.me>

⁵ See <https://angelicadass.com/photography/humanæ/>

⁶ <https://kehindewiley.com/works/a-new-republic/>

Una Caca by Lula Gómez,⁷ and other artists like Judith Scott of the Creative Growth Art Center in Oakland.⁸

In the second stage, we collectively reflected on how cultural diversity was approached in each art project, describing the different social issues that artists deal with in their work. Initially, the aim was to become familiar with different contemporary artists to understand how art offers reflections on social issues for a better understanding of their cultural complexity. Later, the art and diversity approach is defined, in which artworks are understood as cultural productions that focus, in this proposal, around three major themes: gender, disability, and race and ethnicity. Thus, cultural productions become dialogic mechanisms that address different concerns around these three themes. The students decided on a theme to focus on in their project through dialogue, reflection, and artistic practice.

After deciding on their theme, the students discussed and chose a particular social concern they were interested in for their project. The following stage was to create a story focused on that issue through stop-motion animation techniques using the Stop Motion Studio application.⁹ Andrew Selby (2013) defines animation as a form of storytelling in which we bring inanimate objects to life through a sequence of still images:

Animation has the potential to reach developed, fledgling, or emerging audiences in a way that live-action film is unable to because of subjective, cultural, or technical shortcomings. The form can seemingly make the “impossible” possible and has the potential to communicate with young and old alike, regardless of ethnicity, gender, religion, or nationality. (“Introduction”)

Stop Motion Studio is an intuitive interface and simple to use with any mobile device. Within the variety of stop-motion animation techniques (Selby, 2009; Shaw, 2012), animation with clay was chosen with the idea of combining languages that hybridize the traditional with the contemporary practices. Some principles of animation described by Thomas and Johnston (as cited in Selby, 2013) were taught to understand the nuances of animation, such as staging, anticipation, exaggeration, slow in and slow out, and timing. These principles were also analyzed by viewing several

⁷ See this and other animations on Instagram at https://www.instagram.com/lula_gomez_stopmo/

⁸ See a list of artists who work on several media at <https://creativegrowth.org/artists>

⁹ Stop Motion Studio is a digital application used to create stop-motion movies, designed by Cateater, LLC. It is available on the two main smartphone platforms (Android and Apple).

stop-motion movies. Clay might be chosen as a ceramic material, still associated with the artisan tradition, and as a sculptural material used in the process to work the final sculptural piece. Interestingly, it is a three-dimensional material that is rarely used in school, but nevertheless has sensory, kinesthetic, and emotional properties to bring into the classroom.

STOP-MOTION MOVIES ABOUT SOCIAL JUSTICE ISSUES

Although there were similarities in the social justice issues chosen by students, whether it was gender, disability, race, or ethnicity, each stop motion created its own visual story.

Stop Motion 1 (Fig. 14.1a) shows the reality of African migration on the Spanish shores, particularly in the Canary Islands. The idea of this story was to raise awareness of this reality experienced by surviving African migrants, who in many cases are young children and women, as they risk their lives to reach Europe. This story focuses on emotions, especially those experienced by migrants during their journey. The heart used as a symbol represents all those lives that did not reach the shore alive.

The use of symbols is quite common in other animations made by students as they may be more effective in communicating ideas. This is what happens in another stop-motion movie in which cultures are represented from their iconic architectures, trying to give value to less-recognized



Fig. 14.1 Examples of Seesaw Class projects, 2019. (a) *Stop Motion 1* by G. M. Hernández, J. Marrero, J. Rodríguez, and Y. Lorenzo, Class EA-EPV (PA102); (b) *Stop Motion 2* by J. Gamero, O. Gómez, L. San Fiel, and M. Sarda, Class EA-EPV (PA102); and (c) *Stop Motion 3* by K. Rodríguez, N. Curbelo, and S. Benmegdoul, Class EA-EPV (PA101). Reproduced with permission.

constructions such as the *haima*, a type of nomadic housing unit used in the Sahara Desert.

The fight for equal rights between men and women, along with gender violence, was the most recurrent concern dealt with by students who focused on gender issues. *Stop Motion 2* (Fig. 14.1b) illustrates the differences between men and women in the workplace, making it visible through a single line. A path with ups and downs illustrates the obstacles that women must overcome, whereas the single flat line represents the absence of obstacles encountered by men. Overall, their emphasis is on breaking down those barriers and providing an alternative path that will be equal for both men and women.

The visual representation of disability was mainly focused on physical disability. As an example, two animation movies dealt with the obstacles faced by children with physical disabilities during recess time. Students suggested that the school playground is an environment where bullying behavior often occurs. *Stop Motion 3* (Fig. 14.1c) presents an original vision of what it means emotionally to live with a disability. This narration shows the same female figure who adopts three different roles: a person who is blind, a person who is missing one leg, and a woman without any physical disability. Each role is represented through obvious visual features. Meanwhile, heartbeats at a steady pace are noticed when the woman adopts each of the two roles of a person with a disability. However, the heart disappears when the able-bodied woman appears. Students wanted to ask why and leave that question open to enable viewers to draw their own conclusions.

REFLECTION DIALOGUES

Once all the movies were published on the Seesaw Class network, a screening session was held with the whole group to share how they approached diversity issues in their animations. Each group provided collective feedback on each animation, which was posted on Seesaw. It was pointed out that their comments must go beyond recognizing and congratulating their peers for their great work, which was positive, but what was truly significant was to build an enriching critique. To foster linguistic diversity, students were encouraged to comment in English.

To encourage students to offer a more reflective observation, they were asked to address three aspects: (1) to recognize the type of diversity depicted in each animation and find out what social issue was the focus;

(2) to assess whether the environment and characters chosen in the movie setting were appropriated; and (3) to interpret what the message of each animation was.

These questions were discussed by groups and then, comments were posted on each stop-motion movie following the idea of the feed-feed model by Aparici and Silva (2012), where everyone was able to share their thoughts. Most of the students easily identified the type of diversity chosen. The feedback received in peer comments helped the creators to understand whether their message had been clearly understood, and other new unintended messages also emerged.

Once the students had posted their feedback, the creators shared with the whole class the significance initially given to each animation. Sharing this with the whole class also helped them to respond to the different interpretations made by their classmates. The discussion encouraged the groups to participate by exchanging their interpretations and messages, as well as the visual and symbolic resources used. It also enabled them to relate the different animations that deal with the same theme. While the gender, disability, ethnic, or racial diversity approaches were easily recognizable, the messages implicit in each of the animations were not. Among the comments made, we realize how the idea students wanted to communicate was not clearly reflected in the animation and therefore there was difficulty in interpreting it.

From a formal perspective, most of the animations were made in relief by recording all the movie on a two-dimensional surface, which was easier than those who worked the clay three-dimensionally and needed to create a 3D scenario as well. Likewise, symbols were a popular resource used for creating characters and also helped to visually represent abstract concepts. One can appreciate how the reading and interpretation of stop-motion movies highlights the subjectivity of their messages, which is more than positive because it gives feedback to the initial idea and broadens the possibilities for its interpretation.

RESULTS AND CONCLUSIONS

Overall, collaborative animations with original narratives under a cultural diversity approach were highly valued by the students. Furthermore, the choice of the Stop Motion Studio application was highly welcomed because it is intuitive and easy to use. It is a versatile tool for developing other animations with a pedagogical purpose and can be applied to other

contents. Students were willing to learn digital tools for learning and accessibility through mobile devices.

The complexity shown for 3D figures is clear since they are hardly familiar with clay and with any 3D material. In the future, it would be interesting to teach other types of animation, such as pixilation, which could be another alternative to using their own bodies.

Regarding the cultural diversity approach, the racial and ethnic theme aroused the greatest interest among the students in the class (48%), then gender diversity (29%), and finally disability (23%). The reason for the popularity of racial and ethnic themes could be that students tend to connect cultural diversity with ethnicity and race issues. It is also a topical issue for the students due to the actual migratory situation of the Canary Islands (Defensor del Pueblo, 2021).

Interestingly, almost ten percent of the students were from other countries like Venezuela and Morocco, and different regions of Spain, though the majority of students were from Tenerife and some from the other Canary Islands. Those groups with only one or two students from a different country or region decided to tackle an issue other than ethnicity, avoiding a potentially uncomfortable cultural dialogue. However, the only group whose members were all from different backgrounds selected an ethnic and racial approach, understanding it from the cultural differences within the group itself. They modeled several flags with clay to symbolize the different cultures and combined all of them in a single ball from which emerged a single flag that symbolizes the richness of cultural diversity.

Considering that migration and inclusion were issues discussed in the social dialogues and animations, art can be used as a creative context in which to explore the artistic richness of Morocco and Western Sahara, and broaden the culture of Canarian people. The next step would be for pre-service teachers to design art education proposals that address social justice issues and implement creative school experiences that involve the neighborhood. As Ana Mae Barbosa (2002) stated: “To deconstruct so as to reconstruct, to select, to rework, to take the known and to refashion it to fit one’s context and needs are creative processes exercised through making and seeing art, and they are also essentials for day-to-day survival” (p. 474).

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Media Arts and Assistive Technologies as Empowering Global Communication Tools for Students with Visual Impairments

Debrah C. Sickler-Voigt

Media arts are powerful and creative tools that provide students with multiple ways to communicate their thoughts about art and life's topics. This chapter describes an ongoing partnership between the Tennessee School for the Blind (TSB) and Middle Tennessee State University's (MTSU's) undergraduate art education program. The partnership was developed in 2011 by TSB's art teacher Ms. Monica Leister and me (an MTSU professor of art education). As part of this collaboration, our students (TSB elementary, middle, and high school students and MTSU preservice teachers) use media arts and assistive technologies to produce annual stop-motion animations that communicate students' perspectives on the United Nations Educational, Scientific and Cultural Organization's (UNESCO's) global themes, which include biodiversity, clean water, and conservation. Through media arts, our students combine traditional fine art media with digital technologies such as motion, sound, and visual data to produce

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creative works. In particular, Ms. Leister and I have selected stop-motion animation as our chosen artistic medium because its format provides our students with creative flexibility to combine tactile art media with multimedia, including photography, audio, and filmmaking.

I met Ms. Leister, who had already earned a master's degree in vision and multiple teaching certifications, when she pursued add-on certification in the visual arts at MTSU. During her studies, we talked about the preconceived stereotypes that people can have about teaching the visual arts to students with visual impairments. People regularly ask her: "How do you teach art to students with visual impairments?" I reflected on my own limited knowledge in teaching students with disabilities when I first began teaching and wanted my students to be better prepared than I was. I asked if my students could visit and teach at TSB, and she and her administration approved.

The goals we set for our collaboration focus on (a) providing TSB students with quality learning experiences with the preservice teachers; (b) giving the preservice teachers comprehensive art teaching experiences with students with visual impairments to prepare them for future work in inclusive classrooms; and (c) teaching all participants how to create multimedia stop-motion animations. Our partnership aligns with UNESCO's policy and initiatives that focus on children's well-being (United Nations Children's Fund, 2013) and its recommendation to "implement and evaluate collaborative school-community projects that are based on the principles of inclusive cooperation, integration and relevance" (UNESCO, 2006, p. 17). Our school-community project has an international focus given our participation in the International Children's Exhibition of Fine Arts Lidice (ICEFA Lidice) in the Czech Republic and our experience working with the exhibition's relevant UNESCO annual themes.

Using qualitative research methods (Stake, 2010), I conducted interviews with Ms. Leister; Mr. Allen Huang, TSB's Assistive Technology Coordinator; Mr. Joshua Harper, TSB's Secondary Technology Educator and a TSB graduate; and August (a pseudonym to maintain student privacy), a tenth-grade TSB student who has worked on the stop-motion animation projects. Additionally, I interviewed two MTSU preservice educators: Jason Johnson, who has a visual impairment and attended TSB as a child, and Emily Armstrong, who taught the TSB students. All interviews occurred between April 5 and 28, 2021, on Zoom, due to the COVID-19 pandemic. I performed member checks to ensure accuracy. Based on my interpretation of the data, review of literature, and

experiences, the following provides an overview of the need for our collaboration, our use of assistive technologies, and strategies for teaching media arts using assistive technologies with global implications.

HOW DO YOU TEACH ART TO STUDENTS WITH VISUAL IMPAIRMENTS?

The United Nations Convention on the Rights of Persons with Disabilities (2006) states that States Parties shall ensure that the “education of persons, and in particular children, who are blind, deaf or deafblind, is delivered in the most appropriate languages and modes and means of communication for the individual, and in environments which maximize academic and social development” (Article 24, 3c). Learning how to teach students with special needs is an important component of teachers’ professional development, beginning in preservice education, so that educators understand the diverse characteristics of students with special needs and how to make necessary modifications and accommodations for students to reach learning goals (Bain & Hasio, 2011; Sickler-Voigt, 2020).

A starting point is for preservice teachers to become familiar with the United States Department of Education’s (2006) Individuals with Disabilities Education Act, which mandates that children with disabilities receive a free, appropriate, public education in the least restrictive learning environment. The law requires that each child receives a personalized instructional plan, called the individualized education program (IEP), that identifies how the child learns best and may include the assistive technologies designed to facilitate student independence. The Tennessee Department of Education (2018) further explained that “for assistive technology to benefit the student, the school and parents must also be trained on the purpose and use of the assistive technology and its importance related to meeting the student’s educational needs” (p. 87). In addition to learning about the Individuals with Disabilities Education Act and the role of assistive technologies in special education, the preservice teachers need to learn the characteristics of visual impairments. The World Health Organization (2019) explained that “vision impairment occurs when an eye condition affects the visual system and one or more of its vision functions” (p. x) and that worldwide 2.2 billion people have low vision or blindness. People who are diagnosed as legally blind vary in their sight acuity and clarity. Their vision ranges from low vision (diminished

visual quality that cannot be cured with glasses, medicine, or surgery) to blind.

Accessibility is a core theme in disability education and has different meanings according to its applications. For example, the United Nations (2007) identifies accessibility as “giving equal access to everyone.” “Accessibility” also refers to assistive technologies that span from low-tech (e.g., white cane, magnifying glass) to high-tech products (specialized technological equipment). They also include regular technologies that users with disabilities utilize as accessible tools. Ableism—the act of discriminating against people based on perceptions of what able minds and bodies can do—is another key concept in special needs education (Derby, 2011). Mr. Huang explained how to change perceptions of ableism: “When a preservice student, who might have come from a certain preconceived notion sees the opposite—that these kids can [create], it can break down those unconscious walls that they have.” With these concepts in mind, my instruction centers on teaching the preservice teachers about the TSB students’ abilities, ways to eliminate biases, and how educators use multisensory resources and assistive technologies to guide instruction and student learning.

TEACHING WITH MULTISENSORY RESOURCES AND ASSISTIVE TECHNOLOGIES

Showcasing TSB students’ abilities, I present a slideshow filled with images and animations that document our annual TSB and MTSU collaborations. We follow Ms. Leister’s lead in teaching with multisensory resources that include sounds, smells, and tactile objects. The preservice teachers develop sensory boxes and tactile reproductions of artworks that align with ICEFA Lidice’s annual UNESCO-inspired theme so that their stop-motion animation lessons are inclusive—meaning all students can contribute to the project’s goals, given modifications and accommodations that align with their disabilities (Hunt, 2020). In preparing accommodations for students with disabilities, I teach the preservice teachers how the Tennessee Department of Education (2018) states that “accommodations do not reduce learning expectations” and that their purpose is to “provide equity ... for students with disabilities” (p. 42).

Our development of accessible instructional resources originally focused on tactile products that assist learning and has broadened to include

assistive technologies that use artificial intelligence (AI)—computers and devices that are programmed to think and perform problem-solving actions like humans. When students have access to assistive technologies, they can participate in learning tasks that might have been impossible or more difficult without them (UNESCO, 2019a). Mr. Huang provided an overview of how TSB’s assistive-technology solutions facilitate access to educational materials and routines:

- (a) “access to print materials or print media,” such as enlarged print documents, books, and embossed braille text.
- (b) “access to digital media or digital content,” including content on computers, cell phones, and tablets.
- (c) “access to producing work independently,” such as using a computer keyboard for typing and magnification for handwriting.

Teaching students with low vision, Mr. Huang emphasized the importance of magnification so that students can “see what is needed to be seen.” The preservice teachers print documents with larger text sizes and also work with the school’s low-tech magnification options, including a magnifying glass and a dome magnifier. The school also has powerful high-tech electronic video magnifiers that use cameras to enlarge printed content onto a screen. Ms. Leister’s classroom has manual braille writers for students who read and write braille. She uses a braille embosser to make printed copies of written documents that include students’ original writings and instructional content. Students who are blind also have access to a refreshable braille display that reads text output from a computer device. Screen readers, such as VoiceOver for Mac and JAWS for Microsoft Windows, are software programs that make printed content on a screen accessible to students with visual impairments by using a speech synthesizer and/or displaying text on a refreshable braille display.

We create the stop-motion animations using Apple devices. Mr. Harper sets up a TSB iPad on a tablet holder when we work at the TSB campus. I do not have a classroom set of iPads for the preservice teachers and offer use of my personal iPad and university MacBook Pro when we are in class. Preservice teachers who have Android devices pair up with peers who have mobile Apple technologies or borrow my personal Apple devices so that each teaching group can share files to bring the different stop-motion animation components together using AirDrop. The Mac apps we use for iPhones and iPads include their built-in camera and the Magnifier app that

we download from the App Store for free. Additionally, we access Microsoft's free Seeing AI app, which uses optical character recognition (OCR) tools to convert text to speech. Available on iOS for iPhone or iPad, Seeing AI is an ongoing research project by Microsoft that is an excellent tool to make instructional resources accessible to students through its audio feedback channels. It uses the device's camera to read visual information and convert it into descriptive audio narrations. When scanning an artifact, Seeing AI's audio guidance assists users in positioning the iPhone's camera so that they can independently capture documents and handwritten notes without cutting parts off or leaving them completely out of the picture.

Creating Stop-Motion Animations: "It's Always Fun. It's Always Crazy in the Art Room"

Describing the annual visits, Mr. Harper remarked: "It's always fun, but it's always crazy in the art room." The same applies to his technology classroom, which is located next door to the art room, as we utilize his space, equipment, and instructional knowledge to create our stop-motion animations. Following my Practicum course's schedule, our student populations meet in person for four mornings on Mondays and Wednesdays in the spring semester. There are ten to fifteen preservice teachers enrolled in Practicum. We all drive to TSB, which is located thirty-eight miles (61 km) from our MTSU campus, on the first and third mornings to teach the elementary and middle school students. On the second and fourth mornings, Ms. Leister brings her secondary students to my classroom on the MTSU campus. Each TSB group has ten to fifteen students, which allows for a one-to-one or one-to-two preservice teacher to TSB student ratio. The preservice teachers only teach the TSB students during the Practicum course, whereas many of the TSB students work on the stop-motion animation projects for multiple academic years. Ms. Leister, her administration, and her peer teachers welcome us into their school fully aware that the preservice teachers are learning how to teach and have not had prior experience teaching students with visual impairments. To keep TSB students and preservice teachers focused during each two-hour lesson, we use learning centers and divide tasks into thirty-minute intervals. We monitor the preservice teachers' and students' interactions. When preservice teachers make instructional mistakes, we give them room to find solutions and step in to offer support as needed.

Navigating New Spaces

The first day of instruction is always the most challenging for the preservice teachers. Ms. Leister recommends that the preservice teachers break activities “into smaller steps, giving clear descriptions, and monitoring progress,” so that they will be able to reach project goals. Getting to know each other is a priority. TSB student August stated that it is important for the preservice teachers to learn at the onset of instruction if a student is completely blind or has low vision so they will know how to make the proper accommodations and use the most appropriate assistive technologies. The TSB students are familiar with their own classroom’s layout and resources, whereas the preservice teachers need to learn where everything is located. Conversely, the MTSU classroom is less familiar to the TSB students. To assist them in navigating the classroom, they introduce the preservice teachers to proper human guide techniques.

The TSB students can use Seeing AI’s scene channel to take individual photographs or keep their device’s camera rolling to navigate the MTSU classroom spaces in real time. This includes identifying furnishings and class signage through audio descriptions. Seeing AI scans art posters, word walls with academic art vocabulary, and other relevant information posted on walls and boards that students with visual impairments may be unable to see. Preservice teacher Jason, who has low vision, uses his iPhone’s Magnifier app to see things in the classroom that are close up and far away. He expressed: “anything that has a magnifying capability is always a good piece of equipment.” He prefers the Magnifier app to his monocular telescope (similar to binoculars, but with a single lens for quick distance access) because “it’s great for seeing things in just standard light. With my disability, I can’t really ... pick up light, as well as the cameras do.” The app does it automatically for Jason, whereas his monocular does not.

Script Development

The preservice teachers present their instructional resources to the TSB students to prepare their collaborative stop-motion animation scripts and learn lesson content and context. To complete this task, the TSB students need access to resources such as black permanent markers, large print text, computers, and braille writers. Some TSB students with low vision prefer black permanent markers as an alternative to pencils for writing and drawing because they produce larger text and clearer lines that contrast against

white paper, making them easier to see. Preservice teacher Jason uses text magnification in combination with listening to a screen reader to access and process written content. August learns differently and expressed the need for proper tools. If she were given a document with large print used for students with low vision, she exclaimed, “How am I going to know how to do it?” She prefers reading in braille compared to listening to a screen reader alone because she does not have “to remember what the screen reader ... was saying,” and she explained the added benefits of reading from her refreshable braille display: “It helps people like me get more fluent with their braille, but also typing.”

The Seeing AI app is an AI resource for TSB students to learn about the context and procedures that drive learning goals (UNESCO, 2019a). For example, the preservice teachers can use the app to supply an accessible list of directions and/or procedures that students can refer to as needed. The preservice teachers can scan a single-page document or book page with Seeing AI and save it as text. Seeing AI’s handwriting channel converts teachers’ and students’ handwriting into audio descriptions—offering access to information that is not normally available in digital formats and braille. Seeing AI also reads photographs through its Browse Photos feature. Preservice teachers and students simply select the image of their choice and the app will produce a brief one-sentence description to interpret its subject matter and content. (Note that sometimes the interpretations are inaccurate, as this technology is still developing.) The preservice teachers can also write descriptive alt text—a brief one- to two-sentence description of an image (Daisy Consortium, 2020). Digital alt text is accessible using screen readers and braille displays.

Stop-Motion Animation Production

With the script prepared, the students begin producing the remaining parts of the stop-motion animations. They create the characters, props, and sets using tactile media. During instruction, Emily learned that “you have to learn to adapt to each kid.” She created a sensory box filled with sand and cacti to teach students about the desert’s biosphere so that they could create a desert-themed set. Project filming occurs when the TSB students have completed the sets, props, and characters (Fig. 15.1). During past collaborations, the preservice teachers physically and orally guided the students so that they would know if the full stop-motion set was visible within the iPad camera’s viewfinder. They assisted them



Fig. 15.1 Preservice art educator Kaitlyn Estes collaborates with a Tennessee School for the Blind student to move Claymation characters on the animation's set and photograph their stop-motion animation, *Arctic Blues*. (Sickler-Voigt, 2022)

in locating the shutter on the digital screen. Judy Dixon's (2020) book, published by National Braille Press, explained how Apple's iOS 14 and iPadOS 14 mobile operating systems provide enhanced accessibility features for users with visual impairments using AI that enables users to take pictures independently. She explained how Apple's Camera app is compatible with the Seeing AI app. TSB students can use it to check their in-progress photographs and verify a photograph's qualities and subject matter. Seeing AI's Color channel identifies colors to assist students who cannot see color when taking pictures. Its Light channel uses sounds to indicate the levels of light needed to take photographs to inform students who do not have light perception.

The preservice teachers and TSB students also develop narrations for the stop-motion animations and integrate sounds into their storylines when filming. Ms. Leister explained when teaching student with visual

impairments: “Quality sound is a must!” as the sound recordings inform the students’ understandings. The TSB students’ original sound effects have included buzzing bee sounds, stomping feet, clapping hands, and crumpling paper. Mr. Harper, who assists with sound production, notices the excitement the students have as they “make the silly noises” and learn at the same time.

Our final work involves using iMovie on a MacBook Pro to organize and edit the photographs, animation clips, and audio files to produce completed stop-motion animations. For editing work that is not completed during our campus visits, we use digital file sharing to examine working drafts and make editing suggestions. The final animations run between one to three minutes. We check that the parts run together smoothly and teach the intended UNESCO themes. We export our animations at high resolution, share them publicly via social media (see Sickler-Voigt, 2022), and submit them for exhibition to ICEFA Lidice. The final products include closed-captioned text to make our works accessible to those with hearing impairments and ease translations for international audiences.

EMPOWERING IMPLICATIONS FOR GLOBAL EDUCATION

The experience of teaching visual and media arts to the TSB students introduced preservice teachers to the learning characteristics of students with disabilities and offered strategies for making modifications and accommodations using assistive technologies so that the preservice teachers will be better prepared to work in inclusive school settings. Three significant themes emerged that are applicable to global practices:

- accessible technologies are not always accessible;
- professional development is necessary for teaching students with disabilities using assistive technologies; and
- people with visual impairments want and strive for independence.

Making Accessible Technologies Accessible

The AI that drives the high-tech assistive technologies the TSB students use have come a long way since the 1950s when scientists first discussed ways that computers could learn independently (UNESCO, 2019a). They have become more intuitive about users’ needs and people can fit

accessible technologies into their pockets. However, not everyone can afford the luxuries of assistive technologies and AI. Seeing AI is described as a “free gift to the blind community” (Mosen, 2021). While the app is free, users still need access to costly hardware to use it. Saqib Shaikh, Project Lead for Seeing AI and a Microsoft Software Engineering Manager, lost his vision at age seven and attended a school for the blind. His fascination with his school’s expensive talking computers inspired his development of Seeing AI (Desmond, 2020). His work represents how the private sector is developing AI that benefits people with visual impairments.

UNESCO (2019a) advocates for additional international aid, national policies, and partnerships with the private sector—such as Shaikh’s Microsoft work—to bridge the gap that people experience in accessing technologies. Referencing Nye (2015), UNESCO addressed the obstacles of utilizing AI in education, which include students and teachers not having hardware, reliable internet, electricity, and technical skills. This global reality presents the greatest concerns in developing countries that have limited resources. It was also a reality in our own collaboration. Due to the COVID-19 pandemic and its repetitive school closures and switches to online classes, Mr. Harper explained how the TSB students first gained access to one-to-one technology—meaning each student received an iPad or a computer with necessary hardware, such as a braille display. TSB purchased its students mobile hot spots for internet service because many did not have internet at home, which is needed to attend classes on Zoom and complete school assignments. He wants such access to be permanent: “I hope going forward now that we are a one-to-one [school] that we can keep that going—supporting not just the kids but the teachers with the tech.”

UNESCO (2019a) also identified how limited teacher preparation in learning digital skills places students at a disadvantage. The Practicum course, with its access to media arts instruction, prepares future educators for integrating media arts in the classroom with meaningful intent. While our collaboration has purposeful aims and is internationally focused, the preservice teachers I teach do not have equal access to equipment due to cost barriers. Teaching the TSB students, the preservice teachers bring their own devices or borrow my personal devices and work laptop to develop their stop-motion animations. Looking forward, it will be exciting to see how the TSB students’ one-to-one use of iPads will impact our future collaborations. At the same time, it would be encouraging if all teacher-education programs offered one-to-one technology for preservice teachers’ professional development.

Professional Development: “You Can Actually Make a Difference in Someone’s Life”

The teachers and administrators at TSB are experts in teaching students with visual impairments. As a person who grew up with a visual impairment, Jason recognizes how schools can become overwhelmed working with the diversity of students with disabilities without the proper professional development skills and assistive technologies. He wants each school to have a certified specialist in assistive technologies who knows “what to look for ... and [is] able to teach those students and teach the teachers how to use it,” as he believes that such improvements “can actually make a difference in someone’s life.”

Professional development opportunities offered by school districts, professional organizations, and universities provide necessary resources for educators to learn about assistive technologies and media arts. Mr. Harper advocates that preservice educators receive more training. “I really wish in the education field that teachers would take more than one special education class because they [educational leaders and UNESCO] are pushing the inclusion model more versus a separate classroom for them [the students].” Our partnership with TSB during the Practicum extends learning beyond a single course and provides art education majors with access to teaching the visual arts and media arts using assistive technologies in an art classroom, which is not typically the case when studying in a general special education course designed for all preservice teachers.

Mr. Harper advises, “Don’t be afraid, as a teacher, if you don’t understand something, ... try to find someone that might know how to help you.” Ms. Leister and I did not initially know how to produce stop-motion animations and learned by watching stop-motion animations, reading about them, and trial-and-error when creating them. Each year we continue to improve our knowledge of media arts, assistive technologies, and new ways to assist students (UNESCO, 2019b). Our next goal is to develop audio descriptions with a narrator describing the animation content. We remain aware that our own learning must be ongoing to stay abreast of teaching and technology trends. Mr. Huang, who has a storehouse of knowledge on assistive technologies, wants to continue to augment his knowledge for students who are blind.

In writing this chapter, I also discovered that in addition to the value of learning about assistive technologies and AI through professional

development and peer-reviewed scholarship (UNESCO, 2019a), there are numerous up-to-date YouTube videos, blogs, and websites created by blind and low-vision specialists that review assistive technologies, teach others how to use them, and generate feedback to improve assistive technologies (see Mosen, 2021). They are valuable resources for teachers and students alike and can be of benefit to educators who lack access to other professional development opportunities.

Fostering Independence and Leadership Roles

“Assistive products enable people to live healthy, productive, independent and dignified lives; to participate in education, the labour market and civic life” (World Health Organization, 2016). Independence and leadership were common themes in the interviews and apply to student learners across our planet. Emily would like to see an app like Seeing AI develop in terms of its ability to read artworks to give students greater independence when studying art and visual culture images in context. Jason described his enhanced independence: “I have been trying to work toward being as independent as I possibly can.” Graduating from an inclusive high school in the early 2000s, Jason rolled a cumbersome CCTV—a closed-circuit television magnifier—mounted to a desk on wheels to move from classroom to classroom. He had to leave his classes early to avoid busy hallways and had peer students assist him. Years later with an iPhone that fits in his pocket, Jason has access to the magnification that he needs. Working with college peers, he stated:

Be aware of that in the classroom ... I tend to do things on almost a somewhat seamless level when it comes to what other people do. And I know some people, they tend to not see that I have a disability. I do just about everything everybody else does, but there's just a [visual] gap there.

Living with a visual impairment, Mr. Harper stated: “I don't let it stop me. I do what I want to do. I just find other ways of doing it.” He helps his students do the same. August appreciates the independence technology provides: “The computer helps me keep up with my work because it will send, like, reminders about assignments and when they're due. When I go virtual it'll give a reminder, saying that there's a meeting coming up.” Being independent enhances the sense of well-being for students with visual impairments.

Building on Jason's statement that schools need technology experts who know how to use assistive technologies to make positive differences in students' lives, Mr. Huang explained the value of keeping the focus on the individual student and knowing where they are at: "It's incredibly important to be individualized in terms of figuring out the most appropriate assistive technology solution." He cautioned educators not to think of accessible technologies "too broadly" because what works for one student may not work for another. Knowing what works gives students the tools they need to be independent and take leadership roles. Such assessments empower students by letting them know that their voice matters and assist educators in meeting students' social and psychological needs (Hunt, 2020; UNESCO, 2019b, 2020).

CONCLUSION

Teachers and students need access to assistive technologies that enable students to reach learning goals, gain independence, and feel empowered (UNESCO, 2019a, 2020). Ms. Leister and I designed our collaboration that uses assistive technologies and stop-motion animation to prepare pre-service educators in teaching diversified students. Through teaching experiences, the preservice teachers got to know the TSB students, see their abilities, and recognize that disability is a normal part of the human condition (United Nations Children's Fund, 2013). Ms. Leister summarized the impact of our collaboration: "TSB students get the opportunity to work together in teams with preservice educators from the community to achieve their goals. These teams build beautiful films and self-esteem, improve social skills, and gain a sense of accomplishment." Mentoring the MTSU students, she added: "I am able to provide knowledge and tools to preservice art education teachers that will help them teach any future students with a visual disability. This, in turn, provides me with professional growth and experience." We felt tremendous honor when we received a diplomatic visit by the Czech Embassy to award us an honorable mention from ICEFA Lidice (Sickler-Voigt, 2019). This diplomatic recognition combined with our research and conference presentations reinforce to administrators and policymakers about the value of meaningful and empowering partnerships in the arts and their many benefits to students, teachers, and communities.

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Uganda-US Creative Collaborations in Media Arts

Karen Keifer-Boyd and Richard Kabiito

We met in 2006 in Helsinki, Finland, and planned our first transcultural¹ dialogic arts-based collaboration using media arts. Ugandan artist, art educator, and scholar Richard Kabiito was in Helsinki as part of an exchange program partnership between Makerere University and the University of Art and Design Helsinki (UIAH). Kabiito was pursuing a doctoral degree in Art Education. His investigation focused on Indigenous knowledge and how it could be applied to meaning-making practices in

¹Informed by anthropological notions of transculturation (Arroyo, 2016), which are complex multidirectional processes creating hybrid cultures rather than assimilation into a dominant culture, we designed the dialogic encounters and creative activities to challenge assumptions about one's own and others' cultures.

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visual culture within specific cultural groups. As Professor of Art Education and Women's, Gender, and Sexuality Studies at the Pennsylvania State University (Penn State), Karen Keifer-Boyd, a white woman about twenty years older than Kabiito, was in Helsinki as a Fulbright Research Scholar. She taught a course in which Kabiito enrolled at UIAH. Keifer-Boyd had the opportunity to create media arts and art pedagogy curriculum in her courses for students pursuing K-12 art teacher certification and for students currently teaching art in K-16 schools.²

We began our first global media arts project once we returned to our respective home countries and universities. Kabiito returned to Makerere University in Kampala, Uganda, and Keifer-Boyd returned to Penn State in the United States (US). Kabiito, concerned with the loss of Uganda's Indigenous knowledge systems,³ sought to challenge the colonial system of art education at Makerere University, which was entrenched in British imperialist perspectives, theories, and practices. Keifer-Boyd, concerned that most of her preservice art education students had minimal experiences with people different from the Pennsylvania communities in which they were raised, sought to provide opportunities for her students to engage in dialogic arts-based projects with Makerere University students raised in Uganda.

In this chapter, "we" refers to Kabiito and Keifer-Boyd. In the autumn of 2020, we met for two hours on two consecutive days to discuss the nature of our transcultural dialogic media arts collaboration. We discussed how and why we began and continued our collaboration, as well as how and why the collaborative projects change. We recorded our conversation and used the transcript to inform the text in both form and content. This chapter is based on our dialogic reflections about more than a decade of collaborating together and with students in our courses via various media

² K-16 refers to kindergarten to senior-level undergraduate university education.

³ There are several Indigenous knowledge systems after the assimilation of different cultural groups into the Buganda Kingdom. These groups still have their own cultural practices, names, social organization, and so on. For example, the Babiito of Kkooki originally migrated from Bunyoro Kitara Kingdom, where they were from the Nyoro royal family. They maintained their own king (the Kamuswaga), naming rights, and other cultural practices, including material cultures that specifically belonged to them. There are several other groups from the Ssesse Islands, in Lake Victoria, and the Banyala from Northwest Buganda Kingdom, who practiced their own cultures and had their own kings or cultural chiefs. Nevertheless, these were all Indigenous knowledge systems found in Buganda due to the different kingdoms' constant expeditions and conquests of neighboring people and lands.

arts platforms. We begin by situating our collaborations within the socio-cultural environment of each of our respective institutions to develop our analysis of the changing opportunities and challenges of sociotechnological interfaces of media arts from our first foray in 2007 to the most recent in 2020.

UGANDA: MAKERERE UNIVERSITY'S MEDIA ARTS FORAYS

Kabiito: In the early 2000s, Makerere University's strategic goals were to modernize with new technologies. Since 2018, Makerere has provided a platform for online teaching, which has improved accessibility to media arts technologies. In reflecting on how we began, I remember attending your class "Virtual Learning Communities" at the University of Art and Design Helsinki, which was known in Finland at the time as TaiK and is now part of Aalto University. I had piqued my interest in initiating collaborations, especially as I had seen advantages of collaboration between the two continents of Africa and Europe. When immersed in unfamiliar cultures you begin to reflect on your own culture and nuances in life. I was interested in initiating collaborations between Makerere University's art school and the US for cross-cultural pollination. The class you were teaching at TaiK was an eye-opener, and I wanted to know how to continue these conversations.

When I met you, you were focused on feminism but in your recent work and our recent conversations, you also emphasize social justice, which is new to Makerere scholarship. I have begun to understand how they are connected. When I finished my PhD, I began to work with minoritized people in Western Uganda. Your views have continued to influence my work in addressing issues of injustice toward women and other minoritized groups. Our Indigenous cultures are marginalized groups, so there is a strong connection to our earliest dialogues and vision of our collaboration.

UNITED STATES: PENN STATE UNIVERSITY'S ART EDUCATION MEDIA ARTS FORAYS

Keifer-Boyd: I fondly remember the course I taught at TaiK in 2006 and the wonderful group of students. One student traveled each week to my course on a public transport jet boat from Estonia. I recognized the

benefits of being in person with a group of students, for example, and how our conversations continued in the hallways and beyond the classroom. I also invited each student to meet with me, individually. However, you reached out to me as a student in my course and we met in my office and you showed me a PowerPoint presentation, educating me about Makerere University's art school named after a British white woman, Margaret Trowell. You presented in a very proud way about your art school at Makerere University. On the other hand, you also shared your interest in the stories and oral histories that you grew up with and how to bring these Indigenous ways of knowing and knowledges into your art and research. By doing so, you were challenging some of the very basic notions of the art education system at Makerere University.

You sounded appreciative of Margaret Trowell and her support for launching the school of art and design, but you also recognized the colonialism of the United Kingdom and the European educational system in which the Indigenous knowledge systems that you grew up with in your village were absent. I noticed in that conversation, in our first meeting, you held concerns about humanity. I perceived that you were challenging colonialism and how there are different kinds of knowledge systems. I heard your concern that much of the knowledge about language, culture, and oral histories are lost in Uganda's formal art education. I heard these ideas in our first meeting, which interested me to collaborate with you.

I understood the formal structure of positioning two universities so both become known to each other and would advance the international recognition of the universities, particularly the art programs. However, such recognition is not what attracted me to collaborate; it was you and your philosophy. I found parallels to your concerns in how women's art in history worldwide, and certainly in the US, has been erased or hidden. Art by women is not what people have studied (Pollock, 1995; Stankiewicz et al., 2004). I was a full professor in 2006 and had been doing research in these areas but also drew from my lived experiences. I questioned why Picasso, why Leonardo, why still-life paintings only by male artists from the seventeenth century were important to study in art history classes in the US when I knew there were women artists in all the different movements and periods of art history (see, e.g., Parker & Pollock, 2013). I had been questioning this for some time, how women, of all races and ethnic heritages, were erased out of history. I shared your concerns about the exclusion of art histories not being taught. I don't know if I could have said all this to you at that time because feminism is often considered the

“f” word, a dirty word. People have misperceptions of feminism because most of what we learn about feminism is from patriarchal-controlled media. Feminist scholars, educators, and artists challenge the institutional academic control of what knowledge is considered important and what is not, what is valued and what is not (Acker & Wagner, 2019; Atkinson & Standing, 2019; Jaganathan et al., 2020; Mandalaki & Daou, 2021, Presley, 2020; Sheriff & Wiesner-Hanks, 2021). This is very much where my work is situated. We discussed how a feminist lens helped to illuminate views of women through the Indigenous narratives passed down in communities.

Your presentation educated me about the Trowell art curriculum. However, when I asked questions, not only at that meeting but throughout the course, I would hear about local materials and oral histories in your art. You shared some of those stories and that’s what I got really excited about, and probably the more enthusiasm I expressed, the more you shared and felt comfortable doing so. This is my perception, that you felt encouragement from me to share the oral histories embedded in your art as I was attentive and, at times, probed deeper. Our dialogic first encounters continued when I invited you to Penn State to share the oral histories that were integral to your art. You continued to create more art, drawing on Uganda’s oral histories.

Kabiito: I had not looked at our first meeting from that perspective and now have a different outlook. I was focused on the nature of the collaboration and how it would work because for me that was very important—how do we create these networks, and how would we make it work. Now I can see the connections between what I was talking about and what you cite as your interest then and now.

TECHNOLOGICAL CHALLENGES

Keifer-Boyd: When I was in Uganda in 2010 there was talk about a cable that was going to be laid down in the Indian Ocean to improve broadband, which is now a reality (Song, n.d.).

Kabiito: Since 2018, Makerere has had a new media platform used for online teaching, the need for which was heightened due to the pandemic in 2020 with students off campus. In 2020, all teaching and learning at Makerere University used the university’s platform. I continue to explore how to use these technologies to express our Indigenous knowledge systems. New technologies and new media can help us to understand the

meanings of Indigenous systems, which are still relevant to Ugandans today. Media arts technologies provide opportunities to look afresh and rethink learning, teaching, and artmaking strategies. Therefore, I have invested in learning new technologies to bring Indigenous ways of knowing into my work.

Keifer-Boyd: Your exploration of how media arts can be useful to teaching, learning, and creating art based on Indigenous knowledge systems has some parallels to my explorations, since the 1990s, of how media arts and its applications can be developed from feminist perspectives, values, and theories. As we entered the twenty-first century, universities in the US were encouraging the development of online courses because they could make a profit from large classes and a preset curriculum. I contested about profit over pedagogy, yet I thought online was a good thing but not because universities were pushing online education. Nevertheless, as most of my colleagues did not want to have anything to do with online teaching, it gave me an opportunity to explore feminist pedagogy in online teaching that valued the lived experiences, differences, and strengths that people could bring to their learning.

By the time I was in Helsinki with my Fulbright, in 2006, I had established knowledge and expertise in feminist theories and practices in teaching and creating art with digital technologies and was able to offer a course about new media arts, technologies, and online collaborations. I knew TaiK, by inviting me, valued the feminist perspectives that I brought into the course, but I also knew most students would have learned about feminism from patriarchal media. I knew to be careful about when and how I referred to feminism. After facilitating a learning experience and during the debrief, I explained what we had just done was feminist pedagogy. Then feminism was not deemed so scary, avoiding negative reactions before students experienced feminist practices of agency and seeking multiple and different perspectives. Writing and creating art from lived experiences offers contextualized insight into challenges, discrimination, and obstacles to self-determination (Mandalaki & Daou, 2021; Presley, 2020). Moreover, distributed leadership, or at least recognizing the hierarchies (e.g., the power dynamics that are involved in teacher-student relationships such as when we began our collaboration), is important to diminish power imbalances and foster agency as well as to illuminate the contributions of all stakeholders in a project.

Kabiito: While I grew up living Ugandan Indigenous traditions, it is not something that I considered when I started serious academic work.

However, one of my late professors, Dr. Ssengendo Pilkington Nsibambi, when I was working on my master's degree, encouraged me to draw upon Indigenous cultures, especially the material objects, and explore how to revise them in contemporary contexts. Upon reflection, I realize that Dr. Ssengendo introduced me to remix theories by asking students to recreate the histories of traditional objects. I thought that even though they cannot regain their original purposes, they can be used in new ways. I am continuing the traditions by choosing and keeping the Indigenous knowledge systems alive through storytelling, a very good educational tool. I, along with Ugandan students, learn about the US from movies, television, news, and mass media, which impact our perceptions of the US, such as wealthy and greedy people and cities filled with violence and everyone speaking English. When I arrived in New York, I was frightened although no one was violent to me but rather friendly; the bus driver and passengers from New York to Penn State did not speak English, which surprised and challenged my preconceived notions of the US.

Keifer-Boyd: There is the functional technological part that you and I are always trying to figure out, and even in the Mashup article (Kabiito et al., 2014), which was written closer to our early collaborations, when I returned to Penn State and you returned to Makerere. Some of our conversation had to do with the technology and what could happen, and that was part of what I introduced in the 2006 course at TaiK—using the tools of the time such as Second Life, a way to embody avatars and interact together. The broadband was not strong at Makerere University in those first years of collaborating, so we had technical hurdles to work out. However, more importantly, each project went deeper into how in both groups, both classes, students you work with and students I work with, could recognize their misperceptions—such as those that students in my class held about people on the African continent based on movies and advertisements to contribute to charities that claim to improve the lives of “African children” they had seen. I strive to facilitate learning experiences beyond students’ own lived experiences and familiar visual culture to broaden and, at times, challenge their views. As a feminist, I believe that knowledge is not neutral, and teaching is political. The choices in what we make and what we show, the artwork we choose, the content we choose, the questions we pose, what we say and what we don’t say—this all influences students. In working with you, we have always been very open and candid. Your views of feminism, where you began with those views and then after knowing me, maybe they have changed. I would be interested

in hearing that because, again, I think most people have misperceptions of feminism, such as assuming feminism refers to white women taking charge, thus equating feminism with white supremacy. In my view, feminism is about distributed leadership, valuing all people, prioritizing historically marginalized groups—all notions I brought into our collaborations, and the purpose behind our collaborations. We always start with setting our goals and mission for each project without prescribing what will develop from our collaborative projects.

TRANSCULTURAL DIALOGIC ARTS-BASED COLLABORATIONS

Dialogic arts-based projects, in our collaborations, involve designing the technological functionality and underlying ideas about marginalized groups or knowledge systems that have been ignored or misunderstood. Key to our process is an emphasis on dialogue. From the beginning we referred to our collaborations as transcultural dialogues.

Dialogue has taken different forms and different shapes in our collaborations; however, dialogue is always central to our projects. In our dialogic arts-based projects, dialogue is the content for the artmaking, and the artmaking is a collaboration in and of itself. In what follows, we discuss why we perceive dialogue as important to our collaborations.

Kabiito: Our dialogic arts-based projects are exchanges between artists from different parts of the world. For example, with the theme of house in several of our early collaborations (see, e.g., Paatela-Nieminen & Keifer-Boyd, 2015), students exchanged ideas and inspirations based on their backgrounds and environments in which they lived.

Keifer-Boyd: Collaboration is not only involved in planning, which often needs to happen three to six months in advance; we fine-tune our plans as we get closer to beginning the project with students, and we adjust during our teaching due to world and local events, such as the pandemic, electricity outages, and protests/strikes in academia. Even though we plan, we adjust our plans together, which is part of the collaboration. We set things in motion based on goals with curriculum designed to be open to unexpected and unplanned outcomes. We conceptualize and enact a process. We put a process in motion shaped largely by the semester timetables, which has been a challenging aspect of our collaboration. While we engage in dialogue to plan and set the project in motion, we have always designed and valued collaboration between the students in each semester project. We planned that students would collaborate in

making art together, a process that involves communication and negotiation as there are many decisions involved, and dialogue can be intimate and culture-rich in the sharing of lived experiences.

Over time, we have learned that for students to create art together they need to have meet-and-greet dialogues. In our 2019 Narratives of Places collaboration, students prepared questions to ask the other group. We scheduled time for the groups to get to know each other. We have done this in various ways, such as students sharing familiar idioms. We have had prompts which initiated the conversation. In the past, in the earlier years, we used a program (Dabble) for a group exchange in which students could initiate threads. VoiceThread, for instance, allowed audio-recorded comments surrounding the art that students created together, which gave a sense of embodied presence to hear each other, quite different than reading words.

In recent years, group video calls with Zoom became available. While challenging with the different time zones, we figure out times for students to talk together. Also, recording allowed for those who weren't present to be able to view later. We have always included a process for a meet-and-greet dialogue with whatever technologies were available. For the Fall 2019 project, we planned for three conversations between students—at the beginning, middle, and end of the semester. When I entered the classroom after the first meet-and-greet dialogue, students had gathered around one person's laptop—viewing and discussing the recording motivated them to reengage in the dialogue, which became the content for artmaking.

Kabiito: The dialogue happens at two levels. The first level is the dialogue that takes place between me and you—the preparation, the things we discuss, the things we think about—how are they going to work, and how are the students going to receive this information, how are they going to use it, how will it be useful to them. At the second level, students join the dialogue, which is valuable to learn from each other and shed misinformation and misunderstandings, in which the impact is beyond the collaborative project's time frame.

TWO TRANSCULTURAL DIALOGIC ARTS-BASED COLLABORATIONS

In what follows, we discuss two recent dialogic transcultural arts-based projects in 2019 and 2020. Particularly, we reflect on why we were motivated to do them.

Keifer-Boyd: I am motivated to explore the potential of media. For example, I was curious what watercolors could do that oil paints could not, and vice versa, a type of dialogue with the medium. The medium speaks to me about what I can do with it; and instead of attention to its weaknesses, I sought to extend the medium's strengths. I also bring my philosophy about medium into how I perceive and work with students as "interdependent" rather than independent entities (Kraft & Keifer-Boyd, 2013). I encourage students' divergent knowledges from their lived experiences. Together, in a class, students help each other find the strengths that they could bring into a collaborative project, which I refer to as "empowered by difference" (Keifer-Boyd & Kraft, 2014).

My teaching philosophy drew me to feminist literature, theories, practices, and principles and to consider potentials of online to connect people that normally might not connect. We could not have continued our dialogic transcultural media arts projects without online communication platforms that could connect people at a distance. My engagement with digital and social media technologies was with a feminist pedagogical perspective to include perspectives from marginalized groups and to build distributed leadership. I had access to robust technologies and reliable internet, so I had to consider how I could use such privileges without controlling the project. I listened to you. I listened to what you had in mind.

Kabiito: I am interested in understanding Indigenous perspectives vis-à-vis these new modes of thinking. Growing up, I played Ugandan traditional instruments with my cousins, my young brothers, my sisters, and my mom. We didn't have what I would call modern instruments like guitars, which were foreign to us. We had access to very local traditional instruments. The forms of the musical instruments fascinate me. Storytelling with music, dance, images, and objects are powerful educational tools. I was motivated to bring Indigenous narrative structures to media arts to become useful in teaching and learning.

Sensory Immersion in Narratives of Places: (Re)creating Histories (2019)

Kabiito: In my art, research, and teaching, I examine the narrative structures and adapt these to new technologies and see how they work. In the Narratives of Places project, I had students search for stories passed on from elders because these stories hold much information. Students found that people love telling their stories, which connect to the places where

they live. Rather than beginning with research questions, I told students to “Go and look for stories and let people tell you their stories.”

In the *Narratives of Places* project, the students were engaged in returning the stories they heard in their fieldwork. The more they retell the stories, the more their familiarity grows with deeper understanding of the stories, and they can (re)tell or return the stories using media arts. For example, they used digital cameras and manipulated the images using technological tools (e.g., Photoshop & Illustrator). Others attended to structures of the stories and adapted media arts technologies with digital sound and moviemaking applications to the Indigenous story structures. In these ways, they are returning the Indigenous stories using media arts technologies. I think it was a very powerful way to approach teaching and learning. Indigenous systems offer new ways to use technologies.

Keifer-Boyd: Returning stories through adapting their structures to media arts is fascinating and reminds me how each student, as they went around the table in your course, shared with students in my course about the Ankole cow.⁴ Basically, it was the same story; however, each told it differently and emphasized a different aspect of the story. When your group shared what they were doing, they shared through story, while the US students described what they were doing through topics, themes, and goals. They talked with the Ugandan students about goals and concepts and ideas and their purpose of what they were filming and how they were editing to convey their ideas. Penn State students were fascinated about the story of the cow—the painting of the cow to be able to escape, and how whoever had the best cows had the best kingdoms. Those narratives drove the media arts projects. I loved the process you described to engage in “returning stories,” to not tell stories but to return stories.

⁴ A war erupted between Nkore Kingdom and Buhweju chiefdom because of a cow named *Mayenje ga Ishinjo* that belonged to Kabundame, the chief of Buhweju. The cow was not only huge but also produced a lot of milk. On a visit to Buhweju, the king of Nkore, Ntare the 4th, admired the cow and asked to have it for free, but the chief of Buhweju refused. This prompted the king of Nkore to send his warriors to bring him the cow forcefully. However, Nkore being militarily weak, the king sent two great thieves who painted the cow with charcoal to not be noticed among the other cows and stole the cow. The chief of Buhweju suspected this and sent his warriors to Nkore to retrieve the cow, a war that claimed over four thousand men. The war, with time, became meaningless, forcing the two leaders to sit together and reach an ultimatum. Consequently, Buhweju lost a big territory (*Kashaari*) to Ankole in order for the cow to be returned. Such is the importance of the cow to the people of Ankole.

I noticed that when the students with whom you worked showed us their art exhibition at the end of the project, every media arts work was introduced through story.⁵ First, you had an opportunity to teach such a class, as a professor now established at Makerere University, very different than when you were a doctoral student when I first met you. You also had the opportunity to bring in Indigenous narrative traditions, which was your history and your students' histories.

Remix Exquisite Engendering (2020)

Keifer-Boyd: Our Remix Exquisite Engendering⁶ collaboration in 2020 produced art from remix theories and practices. Appropriation underlies theories of remix, which connects to Indigenous and feminist practices. Feminists have appropriated, talked back to the dominant narratives to bring in marginalized narratives of their lived experiences into their work. Parody is one strategy in using the media to expose assumptions through juxtapositions and overlays that are possible in remix approaches to media arts. House was a theme we worked with for many collaborative projects, broadening views about house, which also generated new stories in the art because house could refer to the body or physical shelter, something that humans live within. It was a broad enough concept that we could approach together, using intertextual theories and strategies, and, also, with our colleague Martina Paatela-Nieminen in Finland with some of those projects. Then we moved into the remix theories and artmaking practices with the Remix Exquisite Engendering project, which draws from European art history, the surrealist strategy of the Exquisite Corpse,⁷ and from

⁵A recording of this session on December 5, 2019, is at https://psu.mediaspace.kaltura.com/media/12%20Uganda%20dec%205/1_bcmfxm1u

⁶Our use of the term “exquisite” in the project title is a signal to the surrealist strategy of Exquisite Corpse.

⁷Four European male artists (Yves Tanguy, Jacques Prévert, André Breton, and Marcel Duchamp) met in Paris in 1925 and played what was to them a familiar game in which each person in a group draws on the next opened panel of an accordion-folded paper without seeing what was drawn on the other panels. However, they added the stipulation that each would draw a section of the body, which they referred to as *cadavre exquis* (Tate, n.d.). The game became popular among artists associated with the Surrealist Movement in the 1920s and continues in contemporary collaborative art practices. Surrealists in the US translated the French phrase to “exquisite corpse,” fascinated with the absurdity of a corpse being exquisite and how life and the body might be constructed when the accordion-folded paper is opened to view the unexpected, bizarre creation, interpreted by Surrealists as collective intuition.

engendering notions of generative. The remix, the appropriations, the parodies, not only convey knowledge but produce new knowledge.

Ugandan students wrote essays about the images that they produced. I assembled the images. I made many versions and put two online for students to view. Ugandan students approached the body very differently than students in my course; perhaps, it was in part a gender difference since I had mostly women in my course, whose body drawings were often about objectification of the female body. By the time I got the images from your group, my semester had ended. Students were very excited about doing this project but didn't have time to write, or think, or reflect, or have a dialogue with your students about the assembled images. The biggest challenge is the differing timetables of our courses, not only time zone differences. With eight-hour time zone differences, we are confined to certain times, when we are both awake and available. You and I can be more flexible than we can ask of students.

Kabiito: Since 2007, many things have changed, especially the broadband is now much more reliable so we can see each other. Still the university's internet sometimes slows down when many students are all logged on. However, in the evening we could have good conversations without interruptions, as we did in Fall 2019. The cost of data has come down tremendously because of competition from service providers and students can afford to be connected even when not at the campus and using the university's internet. Also, there are hot spots around the campus so students can access the internet. Today, it is much easier to teach online with social media platforms like Zoom, WhatsApp, and Facebook. Most teachers are using WhatsApp groups in their courses at Makerere because they are easy to use and don't require many resources. We succeeded in the past to collaborate, but we now have greater opportunities to collaborate together.

Keifer-Boyd: In looking at the 2020 Remix drawings from Ugandan students, there are plane wings for arms, a waterfall for the chest, a traditional Ugandan pattern for the ribs (see Fig. 16.1). One of the US students drew legs composed of whole human bodies. Some incorporated details and others had bold strokes with markers such as for robot rainbow pelvic and thighs. For the head, the mouth is a collage that a US student did, which I overlaid on the bottom half of the mask a Ugandan student made for the head. Together, the assemblage is a remix of two cultures, especially with the addition of the Ankole cow's horns in returning story. In the figure on the right, there is a white-collar business shirt by a

Fig. 16.1 An Exquisite Engendering remix created by Karen Keifer-Boyd in 2020 from drawings by Makerere University students in Uganda (*left*) and Penn State students in the US (*right*).



Ugandan student. On top is a collar that one of my students did that is a Victorian high-neck collar, suggesting women's confinement. There are lines that suggest energy surrounding the internal organs and what's hidden.

Kabiito: Students in my group were amazed to see how their ideas, their drawings, were assembled to create the whole. It is fascinating how

you fit these different pieces to form all the parts of a body. It is meaningful and ingenious because it is a human figure but from all these different parts.

Keifer-Boyd: The style of bright colors creating divisions in the horn is similar in style to the pelvis and legs divided with bright colors, created by three different students, who did not see each other's work until assembled. The top, middle, and the bottom sections connect in style and color but from different students from very different cultures brought together into one body. None of the students in my class dealt with male genitalia, for instance, while a student in your class used the metaphor of a faucet for male genitals. It is a fascinating addition because most students created the female pelvis. I included every single drawing from seventeen students to create two bodies.

FUTURE DIALOGIC MEDIA ARTS COLLABORATIONS

While we reflected on what motivates us to bring students together in transcultural dialogue to collaborate in creating media arts, in conclusion, we discuss how to better facilitate future dialogic media arts collaborations.

Keifer-Boyd: We need to plan early to integrate the project into the courses and our assignments. Exquisite Engendering is not that difficult to explain or do. We will need to decide which classes to partner and begin early in the semester to allow for discussion and assemblage midsemester. Next time, after all students contribute drawings of sections of the body, from these shared elements, let's ask students to each assemble a body and then a group dialogue on how those elements may change meaning according to how it is assembled. The assemblages could be an exhibition. We could add parameters such as to place their assemblages into an environment. The students are motivated to engage in transcultural dialogues, to have such an opportunity, and then to have a purpose or a task to create art together.

Kabiito: Students in the Narratives of Places project wanted to have another class, which is motivational when students are that eager. From the dialogues, students learn much about the world. It is not necessarily about what we discuss as part of the project but the simple questions that are asked in which students share about themselves. In these collaborations, students are learning new things about themselves and about other people.

Keifer-Boyd: We are sheltered in our own bubble unless we have meaningful dialogue with those different from our network, which is a way to change perspectives, or at least broaden them. I have learned about myself through these experiences. You had the opportunity to come to my home and I had the opportunity to go to your home. Yet not all students will have the opportunity to be immersed in another culture. Use of media arts to facilitate dialogue and create art together is eye-opening and impactful learning about self and others. Our reflections on what motivates us to bring our students together in transcultural dialogue to collaborate in creating media arts motivate us further to continue to collaborate through media arts.

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PART IV

Contextualizing Global Media Arts:
Case Studies in Pedagogy



Case Studies of High School Art Teachers’ Perceptions of Media Arts Teaching under the New Arts Curriculum Guidelines in Taiwan

Yu-Hsiang Chen and Christine Liao

Understandings of new media as an art medium and the aesthetic of new media continue to expand and evolve in today’s fast-changing digital age. In recent years, there have been pushes to connect the content knowledge and pedagogical knowledge in art education to the contemporary art world and the visual culture of the digital age (Bequette & Brennan, 2008). In 2014, Taiwan’s Ministry of Education (2014) announced the

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Curriculum Guidelines of 12-Year Basic Education: General Guidelines,¹ which included nine core competencies. These changes were reflected in the Ministry of Education's (2018) revised *Curriculum Guidelines of Twelve-Year Basic Education: Arts Area* (or the "Arts Area Curriculum Standards")² and implemented in 2019. Two of the nine core competencies, "Information and Technology Literacy and Media Literacy" and "Artistic Appreciation and Aesthetic Literacy," are related to the inclusion of new media art in the new arts curriculum standards. The standards included establishing enrichment and expanded elective courses in the high school art curriculum for the first time, such as Performance Creation, Multimedia Music, Basic Design, and New Media Art. A specific set of Learning Focuses was created for each subject. Those for New Media Art encourage students to consider digital technologies not just as tools but as mediums for representing art ideas and creative means (Ministry of Education, 2018, p. 21).³ Their essential learning contents include digital creation process and experience, digital art case analysis, new media aesthetic characteristics, interactive work experience, internet creation and publication, mobile media, and digital cultural content creation (Ministry of Education, 2018, p. 20). It is worth noting that of the four elective courses, three are related to using technology for arts creation, showing the emphasis on technology in basic education in Taiwan.

The standards mainly use the term "new media art," which can be correlated to "media arts" used in the US National Core Arts Standards.⁴ In this chapter, we use the term "media arts" as a field of education, a subject, and an art genre. We use the term "new media" to refer to the Taiwanese teaching context and focus on emerging technology, and the term "new media art" for a more literal translation of how it is described in the Taiwanese standards. Similar terms such as "digital media" and "digital art" are used when referring to other studies in which they are used.

¹These guidelines were developed based on the spirit of holistic education. Basic education in Taiwan is divided into three educational stages: six years of elementary school, three years of junior high school, and three years of senior high school.

²In these standards, Music, Fine Art, and Arts and Life (including Applied Art, Applied Music, and Performance) are the basic compulsory arts subjects for senior high school students.

³Translated from Mandarin by the authors.

⁴See <https://www.nationalartsstandards.org/>

Li-Chen Loh and Ming-Chung Chuang (2011) found that government policy and art teachers are two of the major forces driving the development of media arts education in Taiwan. While emphasizing the powerful influence of art teachers, they noted that their training leans toward technical guidance. Their finding implies that one way to predict the future of media arts education in Taiwan is to use art teachers as bridges to understanding how new policy and standards may be practiced.

Teaching is a conscious activity, and teachers' beliefs affect their interpretation of theory and experience, teaching plans, and teaching behaviors (Nespor, 1987; Stuart & Thurlow, 2000). Understanding art teachers' attitudes toward teaching media arts can shed light on the potential impact of the 2018 standards on teaching practices because "attitudes are often strong predictors of behavior" (Eaton & Visser, 2008, p. 40). Research often defines attitudes as a person's evaluation, judgment, or feeling of something (Njiku et al., 2019). Understanding teachers' attitudes toward curricular changes may also provide policymakers and school administrators with a direction to maximize the expected effect of the new policy and standards.

We consider factors impacting teachers' attitudes toward teaching new media in three dimensions: past, present, and future. In the past dimension, experiences with new media from an early age and in teacher-training programs are potential influences on attitudes. The present dimension might include the support for current teachers and their new media-related teaching experiences, whereas the future dimension includes the uncertainty of changes to new standards and policies. We first discuss literature in the three dimensions and then present our research questions and research method, followed by an analysis of our case studies of art teachers in Taiwan. The conclusion draws on the past, present, and future dimensions to offer suggestions for policy considerations.

PAST, PRESENT, AND FUTURE: ART TEACHERS' ATTITUDES TOWARD NEW MEDIA

The Past

Teacher training has long been a prominent discussion for new media in art education (Bequette & Brennan, 2008; Delacruz, 2009). Although different programs might have various courses addressing digital

technology, preservice teachers are probably not prepared to face the media art forms and teaching guidelines in a real school environment (Bequette & Brennan, 2008). When facing digital natives—students who grow up in the digital environment—teachers become digital immigrants (Prensky, 2001). Furthermore, even today’s college-aged preservice teachers might not be as tech-savvy as many educators assume (Abamu, 2017). Thus, several scholars have advocated for the inclusion of media arts in art teacher-training programs, because only when teachers can experience the innovative application of new media will they be able to use it creatively in their classroom (Patton & Buffington, 2016; Roland, 2010).

Extending the discussion to include earlier learning experiences with technology might reveal if there was resistance to new media starting in the early stage. Po-Hsien Lin (2004) found that Taiwanese art teachers who had entered elementary school after the implementation of computer courses in elementary schools in 1986 have significantly more positive attitudes toward computer technology. Without such prior experiences, many art teachers express a lack of confidence in integrating technology (Keifer-Boyd, 2006).

Furthermore, Po-Hsien Lin (2004) found that Taiwanese art teachers believe that digital art is not as valuable as traditional art forms. Similarly, Lilly Lu (2005) found that US preservice art teachers consider digital artwork to have less artistic value than traditional art. Although there has been increasing acceptance of the use of digital media in art teaching and artmaking in recent years (Diehl, 2013), it is still not fully recognized as an art medium by some people (Agyeman, 2015). In a study on college art instructors’ perceptions of digital media and its benefits to artists and art education, Cynthia Agyeman (2015) found that although nine out of the eleven art instructors interviewed believed that digital media should be accepted, the other two still thought it unacceptable to use digital media to create art, and this is related to their perceptions of digital media as lacking the physicality that characterizes most art forms. Sean Justice (2017) also discussed the threshold for most of his students in the process of learning about digital media as “to hold and give over to *digital* as an expressive material” (p. 39, italics in original). In co-author Christine Liao’s media arts course for US preservice art teachers in the fall term of 2021, eight out of nine students stated that they thought digital media was important, but none of them felt comfortable teaching media arts. Interestingly, a third of the students still considered works created through Photoshop to be inferior to hand-drawn traditional art (Liao, personal

communication, September 23, 2021). These anecdotes suggest that even if a teacher has the ability and facility to teach media arts, they might hold a negative attitude toward it and might be unwilling to teach it.

The Present

Art teachers are facing practical issues in teaching media arts. Studies have pointed out that teachers feel reluctant to teach media arts, as they think it is difficult and impractical. For example, the time needed to learn how to use new digital tools in the classroom imposes stress on teachers and increases their workload (Black & Browning, 2011; Browning, 2006; Delacruz, 2009). Further, hardware and software accessibility also influences their willingness to integrate technology in their teaching (Phelps & Maddison, 2008). Studies have also found that some of the common factors affecting teachers' technology integration include resources, funding, support, and professional development (PD) (Iding et al., 2002; Khlaif, 2018). Thus, a lack of support in hardware and software and a lack of training are reasons why teachers think teaching media arts is difficult and impractical and are unwilling to teach it. Ching-Chiu Lin (2011) found that schools can successfully support technology integration by creating an "ecosystem of learning that sustains the network between its members (administrators, teachers, and students), who work together toward a shared value of developing student potential through technology integration" (p. 16). It is essential to emphasize the relationships between all members, not just the art teacher or digital tools (C.-C. Lin, 2011).

Co-author Yu-Hsiang Chen (2020) conducted a large-scale survey of Taiwanese art teachers using structural equation modeling (SEM) to analyze the factors that influence the implementation of new media art education. His research found that the elements influencing art teachers' attitudes include their perceptions of the ease and usefulness of teaching new media. This is in turn influenced by their perceptions of facilitating conditions and the support they receive in their teaching environment. Therefore, one of the factors influencing art teachers' attitudes toward teaching media arts is the feeling of support under the new standards.

It is important to note that Po-Hsien Lin's (2004) survey found that competence in technology is the main factor for predicting Taiwanese art teachers' attitudes toward integrating technology, whereas Chen's (2020) research found that the teachers' perception of ease and usefulness strongly influence their willingness to teach new media. Although the two studies

are designed differently, this shift from competence to perception illustrates the changes in education and technology use in Taiwan in the past twenty years, perhaps reflecting a new generation of teachers who have grown up learning and using computers and other technology since elementary school.

The Future

The changes in the national standards have had a significant influence on school art curriculum development. The enriched and expanded elective courses in high schools are becoming a focal point in this change. Loh and Chuang's (2011) research suggests that the development of media arts in Taiwan is strongly influenced by government policy on media arts education and that media arts creation is strongly guided by art teachers, whose reactions to policy changes can affect the media arts creation landscape. Therefore, encouraging the adoption of its new policy has become the key to achieving the government's vision. However, the uncertainty about what the new curriculum would look like in practice could elicit both positive and negative reactions from teachers and affect the current quality of art education.

PRESENT RESEARCH: UNDERSTANDING TEACHERS' PERCEPTIONS OF TEACHING MEDIA ARTS

Building on Chen's (2020) quantitative study of art teachers' attitudes toward teaching new media art, the present study focuses on a qualitative understanding of their perceptions of teaching new media. Attitudes and perceptions are often used interchangeably in the literature. We use the term perception to focus on how individuals' experiences influence their interpretation of phenomena.

Research Questions

Based on prior research, we identified the following theoretical propositions to generate our research questions.

1. Early learning and art-learning experience affect an art teacher's perceptions of new media (P.-H. Lin, 2004).

2. Art teachers view traditional art media and new media as distinct areas (P.-H. Lin, 2004; Lu, 2005).
3. An art teacher's willingness to teach new media is correlated to their individual attitudes toward new media (Chen, 2020).
4. How teachers react to curriculum standards and policy changes is impacted by the school environment and support (Bequette & Brennan, 2008; Chen, 2020).

Based on these theoretical propositions and the influencing factors in the past, present, and future timeline above, this study asks:

1. How do early learning and art-learning experiences influence art teachers' perceptions toward new media?
2. What are the factors that trigger art teachers' positive perceptions and willingness to teach new media?
3. How do different encounters with new media affect art teachers' perceptions and responses to the change of curriculum standards and policy?

Research Method

The study draws on two case studies to understand how different teachers' early learning, art-learning, teacher training, and current teaching experiences influence their perceptions and approaches toward the new arts curriculum standards' inclusion of and emphasis on new media.

Semi-structured, in-depth interviews were used for data collection. We conducted an interview of 30–40 minutes with each participating teacher and added additional interviews to clarify their answers as needed. The interview recordings were transcribed for data analysis.

The main guiding interview questions were:

1. How did you encounter media arts in your early learning and art-learning process, and how was your experience?
2. How do you perceive teaching new media in the school, and what motivated you to teach new media?
3. How would you respond to the curriculum standards and policy changes that focus on teaching new media?

Participants

We selected two teachers who have taught art in high schools for more than ten years as our case-study participants. Although their learning experiences in the teacher-training programs and their perceptions toward new media differ, they both noticed the new curriculum standards' focus on media arts and reacted to the coming changes. Thus, we consider these two cases to shed light on teachers' different experiences and perceptions in teaching new media.

DATA ANALYSIS AND DISCUSSION

We analyzed the data using the following strategies for case studies: relying on theoretical propositions, building case descriptions, and cross-case synthesis (Yin, 2017). We organized our data analysis based on the theoretical propositions in the previous section and built the case descriptions on top of the propositions. We also conducted cross-case analyses to understand the similarities and differences between the cases in relation to the theoretical propositions.

Early Learning Environments and Art-Learning Experiences

Experiences growing up with new technologies influenced these two teachers' different perceptions toward technologies and new media. Yi⁵ grew up in a house that was partly used as her father's machine design workshop, so she was familiar with different machines. She thinks this might explain why she is interested in exploring new technology tools. In contrast, Ping's father enjoys craftwork, and there were very few new technologies in her house growing up. Ping mentioned that she is always late adopting new technologies and relates that she needs a purpose to learn new things and more time to internalize a new skill and use it.

Their linking of early learning experiences to their perceptions toward technology can be understood through other research on the influence of early learning environments on young learners' attitudes toward technology (Ardies et al., 2015). Although early learning environments might foster different attitudes toward technology, young learners' perceptions might be further shaped by their art-learning experiences.

⁵The two participants' names are pseudonyms.

Yi majored in visual art and specialized in design in college. She emphasized that she was a regular student in high school and had never attended the so-called art talent classes for students showing above-average skills in visual art in some K-12 schools in Taiwan. Students usually have to pass specific exams to be placed in such a class and are usually considered to have good traditional art skills. These classes include extra curricula focusing on visual art while reducing some credits in other subjects. Many of the students continue to study art in college, so art teachers commonly come from the art talent class system and tradition. Without such a background, Yi was trying to understand the nature of artmaking in her college years. She felt that her traditional artmaking skills, such as painting, were not as good as those of her classmates. However, having received positive feedback from her design professor, she started to learn about computers and used money from her part-time job to purchase new software and learn different design programs, such as Photoshop and Illustrator. She said, "I wanted to learn how to use digital tools to respond to the field I liked, which was design" (Yi, personal communication, August 20, 2020).⁶

Studies have shown that some people consider traditional art media to have greater artistic value than digital art because traditional art skills are highly valued and one does not have to possess the same skills to create digital media (Agyeman, 2015; Lu, 2005). Therefore, people who considered themselves not as good in traditional art skills are more likely to try digital media to gain a sense of achievement, such as in Yi's case.

While Yi attended a general senior high school, Ping attended an art talent class in a comprehensive senior high school.⁷ She then studied oil painting in college. Computers were not part of her college life. She excelled in the traditional art area of oil painting, so she felt no need to expand her art practice.

Both Yi and Ping were in a traditional fine arts department in a teacher preparation college. When Ping was in college, there were no computer art courses, and there were still very few computer-related courses when Yi was in college. Although Yi took some design classes and started to have

⁶All direct quotations from the participants have been translated from Mandarin into English by the authors.

⁷In Taiwan, a comprehensive senior high school combines the courses of the general and vocational senior high schools. Schools that have an art and design department offer more training in practical art and design skills.

an interest in using a computer to create artworks, she did not consider having further formal training in new media.

Experiences and Perceptions of Teaching New Media

Although Yi had used digital media for design work in college, her first contact with what she considered “new media artmaking,” using interactive as opposed to practical 2D design, was through a new media art conference. She had attended the conference because she knew new media would be included in the new curriculum standards, and in a few years there would be a need to provide new media art classes in senior high schools. She admitted that the conference was overwhelming, and she was not able to absorb all its information. However, she was inspired, and the experience gave her the energy to explore new media. At the time, her interest in new media was to respond to the need to provide up-to-date information for her students by including it in her teaching.

Yi has been teaching new media for two to three years and has been including digital tools in the curriculum. Throughout the interview, she repeated several times that her media arts teaching is a response to her teaching practice. For example, in a project called “Harry Potter Magic Photos” (Fig. 17.1, top picture), she asked her students to film themselves and use their smartphones to edit a movie clip with multiple artistic effects. After the clip is completed, the video’s first static image is captured and printed out. The static image is used as the trigger point for the augmented reality (AR) program to connect the film and produce multiple interaction experiences. The final project looks like moving magic photos in a Harry Potter film. The process motivated students to learn and responded to their interests. Yi reflected that in this project, her consideration was not just how to use tools to create fun effects for moving self-portraits. Rather, she used this project for students to reflect on how technology changes the view of self-images. Her teaching of new media concerns both new media aesthetics and the changing perspectives toward self-image making that new media brings to individuals and society.

Ping did not learn about computers until she saw the requirements of computer graphics in the exam for a high school teacher job she wanted to apply for. She mainly teaches traditional media, such as watercolors and charcoal. However, she shared that she now wants to implement changes so “the traditional things are not so ‘traditional’ ... [I] use this thing [new media] to change my understanding of the traditional or to change



Fig. 17.1 Yi's Harry Potter Magic Photos project (top) and Ping's Augmented Reality Community Maps project (bottom).

students' perception of me [my teaching] and not think I am too old fashioned" (Ping, personal communication, July 9, 2020). As high school students nowadays consider new media more fun and relatable to their daily life, Ping understands that she needs to change her teaching to meet her students' demands, too.

To experiment with teaching new media, Ping tried a project using AR on community maps. After having seen the potential of AR to provide

meaningful interaction for viewers during a PD workshop, she integrated AR into a project that aimed to promote local tourism by having students develop community art maps. Students were divided into groups to visit local businesses and historical sites and take photos of them. Subsequently, they selected places as focal points to introduce on their hand-drawn community art maps. After completing the maps, students learned how to use AR programs to place photos on them. They then filmed their reflections on this project and included the videos on the maps through AR technology. The maps were printed and published for promoting local businesses and tourism (Fig. 17.1, bottom-left picture). Viewers can scan the objects on the map and watch the videos and look at photos at the same time (Fig. 17.1, bottom-right picture). Ping's project was a success and drew the attention of journalists.

Despite her positive experience with this project, Ping continues to reflect on the need to use new media in artmaking: "A journalist asked me why I include new media such as AR when students in my program are not focusing on learning it.⁸ 'What is the role of AR in your curriculum?'... I have been thinking about this question. What's the purpose of learning this thing?" (Ping, personal communication, August 26, 2020) She elaborated her views as follows:

I have been teaching traditional art skills, such as sketches, but it is difficult to connect these skills with contemporary daily life.... So, it is difficult to know the value of these skills. ... My students' drawings are just assignments.... So, I think if they can use their finished work in a practical way and combine it with what's popular today, it would make their work more practical and become part of contemporary visual culture....

On the other hand, if I learned AR and only used it for the assignment, and after that, I don't know how to use it in other places... What is the value of learning it? (Ping, personal communication, August 26, 2020)

For Ping, the most important thing is not learning a new tool but knowing your intention and seeing how the tools can help achieve the goal. She said that many teachers attend PD events and learn new tools but don't know what they can do with them. In her case, she had attended at least three PD workshops about AR, but it was not until the last one that she finally thought of using it in the map project. However, she

⁸ As it was not a new media art program, the journalist asked why she included new media in the curriculum.

emphasized that she was able to implement the AR knowledge only because she already had the goal of making community maps. She said that when she taught AR to her students, she only knew about 80 percent of it. Although there were bumps in teaching the project, she and her students solved the problems together (Ping, personal communication, July 9, 2020).

Perceptions of and Reactions to the New Policy

Although Yi and Ping have different attitudes to new technologies, they both understand the new media art-focused direction of the education policy and standards, and both participated in relevant PD courses.⁹ Thus, to some degree, they both have the ability to teach new media, but their reactions to the new standards and policy changes are different.

Yi thinks that, generally speaking, she would be more willing to accept the policy if it was connected to her teaching. Her understanding of new media is a factor in adopting the policy. Yi (personal communication, August 20, 2020) states, “it is only after learning this is to address an important and irreplaceable aspect of art that we [art teachers] know that we must do it.” She observed that many teachers do not understand new media or its place in the contemporary context, and they feel that they were simply pushed by the policy to integrate new media art standards. Conversely, through different opportunities, Yi understands the significance of new media to art and student learning. Even if she still thinks that she does not have enough knowledge and skill or the art-learning experience to help her connect with new media, she wants to become the bridge to connect new media and her students. Therefore, after the compulsory new curriculum standards were published, she took the initiative to study the content and consider how to connect the objectives in the new standards with her curriculum.

For a top-down policy, Ping questions if the school where she teaches is in sync with the new policy. If the school does not make any changes to the schedule or curriculum, or provide any support for the new policy, it

⁹The courses were held by the Fine Arts Resource Center of the Ministry of Education. There were five sessions in total, taught by university specialists in media arts. The content included new media art aesthetics and creation, such as AR, VR, and basic coding. The workshops only covered the basics. Participants must do their own research and practice the tools in their courses.

is unlikely that she would consider making changes according to the new policy. Ping expressed that whether or not there is support for her to teach new media does not influence her perceptions of the usefulness of teaching it. To consider new media useful for students, she would try it first, and from there ponder the development of new media and its application in the future. Only having the experience of trying new media is not enough for her to recognize its usefulness. Even if the school provides training, equipment, and support, if she does not have an idea or know the purpose of including new media, she is unlikely to teach it. Her attitude toward the new curriculum standards is from the perspective of seeing new media as a tool to help her achieve her teaching objectives. Therefore, instead of including new objectives from the curriculum standards, she would only include new media to fulfill her current teaching goals, such as adding new media to update a traditional art project.

Both teachers consider that education policy should be connected to their teaching context and environment. As Ping said, teaching and learning new tools should not be the goal. It is the intention and how to achieve her vision of an art project that matters. Yi also thinks that it is the understanding of the importance of new media in the contemporary context that motivated her to include new media in the curriculum. Their responses show that their teaching beliefs impact their perceptions of teaching new media more than the policy. Studies in other education fields also showed that teachers' teaching beliefs have more influence on their teaching behaviors than an imposed curriculum and standards (Roehrig & Kruse, 2005; Samaniego, 2013). Thus, even though both Yi and Ping took different degrees of action in responding to the new policy, the policy itself does not appear to have been a significant factor that influenced their attitudes toward teaching new media.

CONCLUSION

The Past: Influences on Perceptions of New Media

These two teachers' experiences revealed that early learning experiences play a role in forming attitudes toward new media. Moreover, Taiwan's unique art talent classes facilitated the formation of perceptions toward valuing traditional art skills, such as sketching, Chinese watercolor, and painting, as these are also the requirements for the college entrance exam. Teachers from an art talent class background value traditional art skills

more and are less likely to see new media as a medium for artmaking. In Ping's case, she sees new media as tools to aid her teaching goals and enhance traditional art projects, not as a pure medium to create art. In addition, Yi's experience with new technology in her college years has influenced her perceptions and led her to learn more about new media and its role as an art medium. This shows the importance of incorporating new media in the teacher-training phase and even earlier experiences in learning art.

The Present: Triggers to Teach New Media

Although both teachers had experience in teaching new media, they differed in their motivations for teaching it. Yi emphasized the importance of teaching new media as a medium and wanted to expand her students' perspectives on art in the context of contemporary media arts. Ping emphasizes the practical value of using the tools and contends that knowing the purpose and value of new media is one of the most important factors for her to teach it. Interestingly, although the literature has indicated that equipment, funding, and technical support are important factors affecting teachers' willingness to integrate technology (Khlaif, 2018), the usefulness of teaching new media seems more important for these teachers, even if their perceptions of its usefulness differ. One reason why access to equipment was not an important factor could be that both teachers were able to teach new media by using smartphones, a tool that most students already own.¹⁰ Whether art teachers see new media as an art medium or as a tool, if teaching new media can achieve their teaching goals, they would be willing to teach it. Therefore, finding ways to help teachers understand the usefulness of teaching new media could be an important key to implementing the new standards.

The Future: Responses to the Policy Change

Through continuous learning about new media, Yi has taken an active position in responding to change by studying the new standards and trying to include the changes in her curriculum. Conversely, Ping's response is more passive, even though she has also attended workshops on new

¹⁰The smartphone ownership rate in Taiwan among fifteen-to-nineteen-year-olds was 99.4 percent as of 2019 (Statista, 2020).

media and has tried to teach it. She understands the big picture of the new direction in the standards but stands by her view of new media as tools to assist students' artmaking. She waits to teach it only until there is a need to use these tools and does not actively seek more opportunities to integrate new media into her curriculum.

The inclusion of new media art in the standards alone is not enough for teachers to make changes to their existing curriculum. For a top-down approach, at the very least, changes need to be made at the school level. As both teachers have indicated, if a new policy does not relate directly to their teaching and the school does not align with it, they will not pay attention or respond to the new changes. From these two teachers' experiences and perspectives, we think a bottom-up approach would be more effective. Teachers need to be motivated. Whether it is to expand the definition of art for students or use the tools to help students achieve their artistic vision, teachers would respond to changes in curriculum standards if they see the value of doing so for their students.

Implications

This study contributes to the qualitative understanding of teachers' perceptions toward new media by exposing how early learning and art-learning experiences have considerable impacts on teachers' perceptions toward new media and their responses to teaching it. Further, the beliefs formed through their own learning of new media could influence teachers' perceptions of the usefulness of teaching new media, their willingness to teach it, and their responses to the policy changes. This narrative relationship was not easily understood through previous quantitative survey research (see, e.g., Chen, 2020).

Taiwan has been setting goals of using technology to advance society, particularly in the past decade. Part of the blueprint is to expand technology and new media to all basic education areas by creating new curriculum standards. The research results suggest that, ultimately, the perceptions of media arts and the understanding of its values are more important for teachers to teach media arts. Changes in the perception and understanding of new media have to be achieved through earlier education or continuing to participate in learning about new media. As in both teachers' cases, even if their perceptions and points of entry are different, they were both able to teach new media. Through their teaching, they are cultivating

a new generation of students whose perceptions of new media will differ from those of previous generations.

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Time Management in Media Arts Education: Stories from Taiwan

Yichien Cooper

In 2014, Taiwan announced its plan for a twelve-year mandatory public education reform. Centered on the goal of cultivating lifelong learners with core competencies, the new standards outline three dimensions: “spontaneity; communication and interaction; and social participation” (Ministry of Education, 2014, p. 5; see Fig. 18.1). Under communication and interaction, or “interactive communication,” there are three major subitems with expected core competencies, summarized as follows from the Ministry of Education (2014):

1. Semiotics and expression: develop the ability to use symbols, “including language, characters, mathematics, science, bodily postures, and arts” (p. 8); develop empathy for others; and apply such knowledge and capabilities in life or in the workplace
2. Information technology and media literacy: develop the ability to “use technology, information, and media of all types... and ... to

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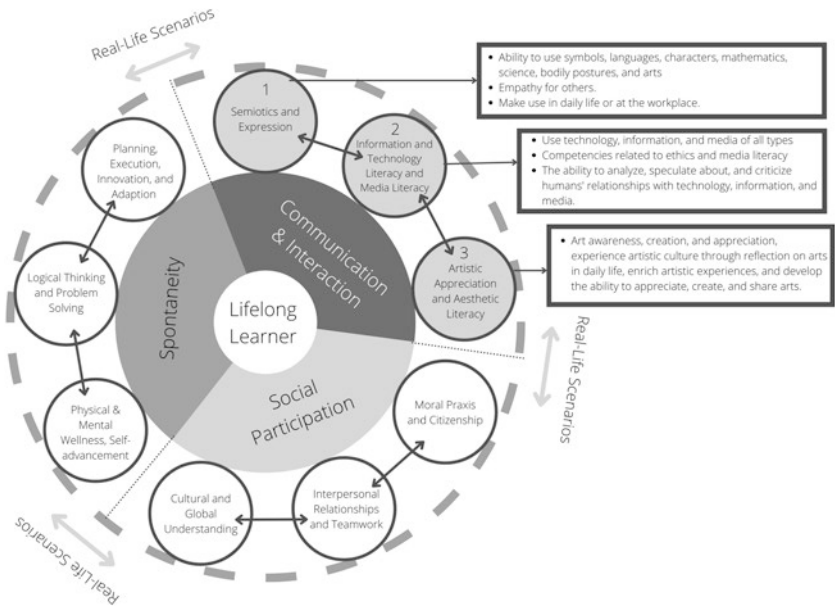


Fig. 18.1 Taiwan’s twelve-year core competencies: Overview of the three dimensions and nine subitems, with a focus on the Communication and Interaction dimension (based on Ministry of Education, 2014)

analyze, speculate about, and criticize humans’ relationships with technology, information, and media” (p. 8)

3. Artistic appreciation and aesthetic literacy: emphasize art awareness, creation, and appreciation; and provide opportunities for students to “experience artistic culture through reflection on the arts in daily life, enrich artistic experiences, and develop the ability to appreciate, create, and share arts” (p. 9)

These subitems are related to media arts education, reflecting the Ministry of Education’s strong stance on incorporating arts and technology in the twelve-year school curriculum.¹ As a result, many school districts in Taiwan have started to develop pathways to combine arts and

¹In Taiwan, the twelve-year basic education system consists of elementary (grades 1 to 6), junior high (grades 7 to 9), and senior high (grades 10 to 12) schools. It does not include kindergarten.

technology. This change has been further escalated by the maker movement in Taipei since 2013 (Maker Faire Taipei, [n.d.](#)) and STEAM, an educational approach that highlights interconnections between science, technology, engineering, arts, and mathematics. Many Taiwanese schools have begun to utilize preexisting media arts programs and makerspace clubs to meet the new standards. The new waves of pedagogical changes solidify the 2018 standards for technology and the arts (National Academy for Educational Research, [2018](#)), which emphasize the integration of media arts as a means to cultivate visual literacy and an appreciation for day-to-day aesthetics (Table [18.1](#)).

To achieve holistic, diverse, and inclusive education, Taiwan’s Ministry of Education welcomed these instructional approaches by establishing demonstration centers at select elementary and secondary schools. These centers aim to assist teachers in expanding their knowledge and capabilities to design creative lesson plans, diversify teaching materials, and promote student engagement.

Table 18.1 The emphasis on communication and interaction in the technology and arts standards in Taiwan’s “Curriculum Guidelines of 12-Year Basic Education for Elementary, Junior High Schools, and General Senior High Schools” (based on National Academy for Educational Research, [2018](#))

<i>Communication & interaction</i>	<i>Technology standards</i>	<i>Arts standards</i>
Semiotics and Expression	<ul style="list-style-type: none"> • Use symbols related to technology • Apply computational thinking strategies to express and communicate 	<ul style="list-style-type: none"> • Use and apply artistic symbols to explain, communicate, and express ideas related to artistic styles
Information and Technology Literacy and Media Literacy	<ul style="list-style-type: none"> • Build basic knowledge of technology to develop digital literacy • Understand the use of technology, its interactive relationship, and impacts on human lives 	<ul style="list-style-type: none"> • Understand and analyze the relationship between digital literacy and aesthetics • Use media and IT to create and express through art
Artistic Appreciation and Aesthetic Literacy	<ul style="list-style-type: none"> • Understand and appreciate the application of aesthetics in technology 	<ul style="list-style-type: none"> • Enrich, experience, and appreciate the relationship between arts and life through a multisensory approach

Since summer 2014, I have been invited by Taiwan's National Academy for Educational Research to facilitate workshops on developing adaptable guidelines, samples, and assessment tools for art teachers. Having conducted several workshops on STEAM and integrated arts curricula over the years, I gradually discovered that although art teachers view media arts as gateways to meet the new standards, they are hesitant to incorporate it in their teaching. "Lack of time" was the most frequent response. Indeed, literature has shown that time limitations are a major stumbling block for teachers attempting to make new media accessible to their students (Black & Browning, 2011; Freire & McCarthy, 2014; Gregory, 2009; Örtengren, 2012). Thus, it was not a surprise when one Taiwanese teacher revealed to me that she constantly felt chased by time to meet expectations set by her superiors; there was simply no time to explore other possibilities.

Interestingly, during my visits to several public schools in Taipei, I came across many successful media arts programs. I began to ponder the following questions: First, if time is an obstacle, how do experienced media arts teachers manage their time? Second, what is the role of time in a technology-driven art classroom? And third, how does the use of time affect teachers and learners? These are the questions that help guide and frame the current study, where I apply narrative inquiry to reimagine and redefine the meaning of time from the perspectives of three media arts educators in Taiwan.

TIME MANAGEMENT IN AN EDUCATIONAL SETTING

Time management is an essential skill for teachers to keep up with day-to-day demands (Aquila, 1992), and it is often one of the evaluation criteria for assessing a teacher candidate's readiness. For example, as listed in Washington State University's (2022) Professional Dispositions Evaluation for Field Experiences, the assessment of time management skills includes the ability to provide "smooth and timely transitions" during instruction, to foster a positive learning environment by organizing "time, materials, lesson plans in timely fashion," and to demonstrate professionalism by being punctual. When compiling survival advice for middle school art teachers, art educator Helen Hume (2014) emphasizes the ability to allocate time for different purposes. They suggest, to manage time, teachers need to learn to estimate time for certain procedures, ensure equal time for individualized instruction, allow adequate wait time to situate students, provide enough work time, and make time for dialogue and

creativity. According to Daniel Golden (2016), time management strategies can be described in terms of our use of proportion to redistribute various time spans to increase effectiveness; resolution to define measurable units of time with different perspectives, such as context, content, and value; and segmentation, which can guide us to complete certain tasks by considering the developments and relationships between temporal patterns and temporal narratives. All these suggest that time management “can be best defined as the ability of managing ourselves in order to produce the maximum activity within a certain period of time” (Golden, 2016, p. 52). It is apparent that the effectiveness of time management affects the overall academic performance of both teachers and students.

ORGANIZATION OF THIS STUDY

This chapter discusses the complexity of time management and the impacts it has on teaching and learning in media-arts-driven educational settings within the Taiwanese context. Three Taiwanese art teachers were selected using the snowball sampling technique (Erickson, 1979; Noy, 2008). To generate “unique social knowledge of an interactional quality” (Noy, 2008, p. 328), I solicited recommendations and chain referrals from identified experts and educational policymakers at several governmental institutions in Taiwan. Their suggestions served as seeds for me to pinpoint suitable participants for this study. During the process of recruiting participants, I learned that many grades 1 to 12 media arts programs have become a “front and center” model for STEAM education, as described by one policymaker (personal communication, July 3, 2018). I also learned that media arts teachers form various tight-knit communities that are interconnected. A total of eight media arts teachers were suggested: four from high school, three from elementary school, and one from an after-school program. For the purposes of this chapter, I considered each teacher’s grade level and whether the media arts components were maintained throughout the semester at a public school to understand the factors and impacts of time. In the end, I selected two media arts teachers from elementary school and one from high school.

My original plan was to conduct these interviews on site to gain a more holistic perspective. I was able to complete two interviews from December 2019 to early January 2020, but as the COVID-19 pandemic began to spread in 2020 I had to postpone my other scheduled school visits. I conducted the remaining interviews using online face-to-face communication

tools such as LINE and Facebook Messenger between July 2020 and April 2021. Each online interview lasted about two to three hours, with additional short follow-up interviews or messages if needed. Some participants also shared their weekly teaching schedules, past projects, website links, and student samples, which provided supplementary contextual information for understanding their time management strategies.

This chapter offers an assembly of conversations I had with the three participants—Jack, Madeline, and Olivia.² Guided by narrative inquiry (Daiute, 2014; Wells, 2011), the perspectives and experiences of three art educators in Taiwan concerning time are first translated from Mandarin Chinese or Taiwanese dialect, then analyzed in context to pinpoint emerging patterns (Anderson, 2000). These narratives serve as lenses to reimagine and redefine the meaning of time to formulate pedagogical strategies for effective time management. After synthesizing these narratives, issues concerning the concept and use of time surfaced to capture the art teachers' time management, their students' responses, and their professional development.

JACK: TIME CREATES CO-TEACHING OPPORTUNITIES

Jack has been teaching media arts at the H Elementary School in Taipei for over a decade. Tucked in the corner of an aging community, H Elementary is located close to a major tunnel connecting Taipei's cultural and educational districts. Despite shrinking enrolments due to Taiwan's low birth rate, the school's reputation soars because of its creative energy and media arts programs in which Jack has added computer coding to reflect current trends in STEAM education.

All fifth and sixth graders take a two-hour media arts class weekly. A floor-to-ceiling green screen occupies a third of the classroom space in the media room. A video camera with a tripod was set up for virtual reality (VR) experiences using Google Tilt Brush to paint in the virtual universe. With safety concerns, the green-screen space can fit at most two students comfortably while an instructor carefully monitors their every move. It is hard to imagine how a group of elementary school students would be able to finish their project in a timely fashion. According to Jack (personal communication, December 23, 2019):

²All participant names in this chapter are pseudonyms.

When I first taught this class, it was not as productive as I had envisioned. I wanted each student to have the opportunity to explore and create using VR equipment. However, I quickly learned that the limitations of time, space, and tools, and the lack of assistants all impacted the learning experience. With a class of twenty-five students, not much was accomplished and time was wasted. In the end, I spent a lot of time explaining, modeling, and dealing with behavioral situations. I cannot blame the students, though. There was a lot of waiting. And honestly, anybody would be impatient if they were excited to experience VR but had to wait for a long time. I mean, who wouldn't be?

To address this problem, Jack utilized a co-teaching approach. He applied for the city's Artists-in-School program and received funding to hire two teaching artists. Together, they formed a teacher team, which allowed them to divide the regular class size into three manageable groups. Three of them rotate and share responsibilities to maintain the quality of teaching. Jack calls this "circulated instruction," and it allows three projects, taught in rotation, to cover all the teaching goals to creatively explore the various media arts tools for the students to work collaboratively. This saves time and aligns with the interpersonal and teamwork competency skills under the social participation dimension.

The co-teaching team designed three major projects for one semester: (A) Drone Video, (B) VR Drawing, and (C) Digital Music. They divided the class into three groups. Each group worked on assigned projects in different classrooms (or different areas on campus) during the art block. For example, when Group A was out on campus learning how to code drones, Group B was using the media room for VR drawing, and Group C stayed in a traditional classroom using iPads to compose music. All three groups meet up for a combined group critique and assessment at midsemester and a combined presentation at the end of the semester (Table 18.2).

All projects encourage students to be familiar with new media arts tools through experimentation, learning, creation, and play. According to Jack, this approach has become an effective model for other STEAM programs that center around media arts at the school.

Table 18.2 Circulated teaching schedule

	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>
Week 1	A	B	C
Week 2	B	C	A
Week 3a	C	A	B
Week 3b	Organize materials/provide feedback on projects, conduct midsemester assessment (combined collaboration)		
Week 4	A	B	C
Week 5	B	C	A
Week 6	C	A	B
Week 7	Assemble films/assess presentations (combined collaboration)		

Note: Concept and layout were provided by Jack. Redrawn and translated with permission

MADLINE: TIME MOTIVATES LEARNING

Madeline teaches art and filmmaking in a public high school in central Taiwan. Motivated by personal interest, in 2012, she developed the first filmmaking high school course in Taiwan. She welcomes the growing acceptance of media arts in traditional art classes, following recent educational reforms.³ The paradigm shift affirms her belief that teaching art is not just about paint and brushes, but more about the process of creation and the meaning of art. When asked about her view of time as a media arts teacher, Madeline (personal communication, August 17, 2020) expressed that instead of thinking of it as a limitation, she believes time is the greatest motivation for teachers and students to learn more and work harder:

Time is an incubator for creativity. In this incubator, ideas are slowly formed. It needs time to emerge from a cocoon. To any artist, artistic creations require constant experiments. I do not think time limits our learning or binds our feet from moving forward; instead, time motivates us, and even unleashes our desire to be better than ourselves. This is especially true when it comes to filmmaking.

She agreed that tapping into media arts is not an overnight transformation, which may be the reason why many art teachers hesitate to include elements of technology-based tools. She took the initiative to keep pace

³By “traditional art classes,” I refer to classes that use art materials other than computer technology to create artworks.

with advances in technology, teaching by day and learning by night for years. Driven by curiosity on various aspects of the filmmaking process, she took, in her spare time, numerous workshops on camerawork, software editing, sound techniques, special effects, and makeup in the Hollywood style. She applied the accumulated knowledge and experiences to her classroom. Madeline (personal communication, August 17, 2020) encourages teachers to think of time not as an obstacle, but rather as an investment, “I am not going to lie; teaching film making may take longer than what one initially may expect.”

In addition to attending professional workshops to learn up-to-date media arts and filmmaking tools to better prepare her teaching content, Madeline sought partnerships and collaborative opportunities with others who shared an interest in filmmaking. In 2010, she formed a drama/short film club with fellow art teachers. Since then, they have produced films, original music scores, behind-the-scenes documentaries, and teacher workshops. Such collaborative teaching and learning relationships become models for her students to understand how collective efforts could contribute to a complex project.

According to Madeline, a typical film project requires four hundred minutes of class time. Students work in teams. It is multidisciplinary, covering not only camerawork, editing, and sounds, but also scriptwriting, makeup, props, character building, and acting. It requires many outside class hours to complete each assignment. Despite the long hours, her filmmaking class remains popular among her students. She believes the complexity of filmmaking projects enables her students to learn the importance of time management because they require planning but a mindset that is ready for revisions. In addition, students learn to adjust and adapt to many unexpected surprises in the process of filming. Each step requires time. To her, what matters most is that students learn to collaborate to complete their shared tasks.

OLIVIA: TIME EXPANDS LIMITED RESOURCES

Olivia is an elementary school art teacher and a member of the regional art education curriculum development team in New Taipei City. On the topic of seeking effective time management in an art classroom, she revealed that like many art teachers, she became sensitive about time being wasted. As an example, she reflected on her recent experience in conducting a STEAM lesson that uses media arts. From her own observation, she

believed that “for a regular forty-minute lesson, time is being wasted in the following areas: transition (situating students), behavioral issues, organization, and handing out art materials. On average, these will amount to eight to ten minutes. That leaves students only thirty minutes or less to be immersed in their learning” (Olivia, personal communication, August 6, 2020). In comparison, she felt strongly that there is no time to waste in a media-driven STEAM classroom. As her STEAM classroom involves many non-traditional art materials, her students need more time to become accustomed to them. She is constantly reminded of the possibility of “running out of time,” so she subconsciously prepares in advance by “running through various scenarios to prevent additional loss of time” (Olivia, personal communication, August 6, 2020). Olivia’s approach suggests that time limitations only push her to be a quick thinker and a fast responder.

Olivia designed an eight-week-long lesson on representing art masterpieces using paper circuitry, involving in-depth discussions on selected masterpieces, paper cutting, and electricity. She assumed that the fifth graders had prior knowledge in basic circuitry, in particular issues of conductivity, electricity, current, and types of electric circuit flow. However, when she introduced circuitry designs in the sixth session of the unit, she quickly realized that although students had received high written test scores about electric circuitry in the previous school year, they could only recall what they had learned from stock diagrams in their science class. When it comes to designing their own circuit diagrams, students were at a loss as to how to begin. Olivia revealed that, at that moment, she faced a dilemma. She could either let the students use predesigned electric diagrams to save time or find additional time to prioritize the students’ creativity. Since her biggest motivation was to see how students incorporate LED lights with their visual design, she chose to allow time for students to explore and experiment on how circuits work.

According to Olivia, to race against time is to steal some and sacrifice some. Olivia is adamant about preserving students’ work time for creativity. To save more time for students to explore, she sacrificed much of her own personal time after school to prepare individual material kits. Sensing how students became frustrated by series and parallel circuits, Olivia modified her plan, encouraging students to dive deeper in designing singular circuits to restore the students’ confidence. To provide more time for students to create, Olivia reached out to her colleagues, explaining to them her lesson plan and her lack of time to complete the project. Many

teachers supported her idea of combining art and science. As a result, she borrowed and traded time in classes to specifically cover electric circuitry.

DISCUSSIONS AND SHARED CONCERNS

Time for Collaboration and Networking

In this study, the lack of time prompted all art teachers to look into building collaborative partnerships with other teachers. Jack's circulated instruction, Madeline's microfilm club, and Olivia's trading classes are successful examples. Collaborative working relationships built upon mutual interests provide opportunities not only to create a sense of togetherness, but also to help co-construct relevant pedagogies (Brown et al., 2013; Sochacka et al., 2016). In Jack's case, his collaboration with two teaching artists impacts a teacher's sense of self-efficacy, competence, and confidence in dealing with difficult tasks (Schlaack & Steele, 2018; Thompson et al., 2019). Although there are some challenges in co-teaching and co-planning, such as potentially different teaching philosophies and priorities, insufficient planning schedules, and personality conflicts (Pratt et al., 2017), the benefits of being able to find creative solutions, to utilize each co-teaching partner's expertise and strengths (Bremmer & van Hoek, 2020), and to transform stressful and complex projects into manageable sub-tasks outweigh these concerns.

Time for Professional Development Support and Guidelines

All three participants in this study attested that the limitation of time motivates teachers to learn more and do more. They constantly worried that they were not experienced enough to catch up with the fast-changing technology-based tools. To them, professional development programs are essential for refining their ideas on teaching media arts. However, some participants revealed their frustrations about the lack of institutional support. There are no systematic or sequential training programs sponsored by school districts. It is up to individuals to select what is relevant to strengthen their own teaching capabilities through the media arts and the professional development that is available to them. Since there are no specific must-learn curriculum standards in Taiwanese media arts, all participants employ different techniques to advance students' media literacy and their ability to access, analyze, and create. Although some admitted that

the lack of directions and guidelines from schools and government provides freedom and flexibility to learn a variety of software and application tools, it does make teaching media arts a challenge. Consequently, it is hard to build rapport and support structures with other art teachers. They do understand, from the standpoint of professional program providers such as the school district, that the challenge is to facilitate and meet the various needs of teachers who have different skills, levels of technical knowledge or expertise, and educational backgrounds (Peterson & Scharber, 2017). However, it would be useful if the school district could provide guidelines on required skills for teachers to consider.

Time for Bonding with Students

All the participants acknowledged that technology-based art projects take time. They also affirm that it is the process of thinking, making, and building dialogue that shapes the role of time in the classroom. Limitations of time provide more opportunities for group projects. For some students, such bonding experiences are needed to survive the daily monotony of textbooks and tests. In Madeline's case, her high school students are under high pressure, buried in tests, and faced with high parental expectations. Concerned by the increasing youth suicide rate (Taiwan National Suicide Prevention Center, n.d.),⁴ she feels her class is therapeutic for some. Filmmaking becomes an outlet for them to play, pretend, and escape from their test scores. As Madeline (personal communication, August 17, 2020) reflected, "I cherish [my students'] laughter filling the campus in the process of filming and their broad smiles in the outtakes. When they leave the media arts room, I know they will be able to face whatever challenges are ahead of them." In truth, every step in the development of a film provides opportunities for her to get to know the students.

Lengthy projects enable teachers to get to know their students better and build positive rapport with them. Art teachers' interaction with students lead to success stories, where students diligently fulfill assignments when facing multiple challenges. Despite the complexity of the media arts projects and demanding deadlines, the teachers strived to create a nurturing learning environment. Not only did they bond with their

⁴According to a 2019 suicide data set from the Taiwan National Suicide Prevention Center (n.d.), in every 100,000 people, 9.1 percent have died by suicide between the ages of 15 and 24.

students, but the students were able to bond with each other and learned to communicate with and respect one another. Sometimes, getting to know a student means breaking stereotypes and assumptions. One student in Olivia's class who was considered a behaviorally challenged learner became a mentor to the other students. The students' positive transformation is an example of why teachers should not rush to the end but provide students time to build rapport.

Time for Self-Regulated Learning Opportunities

Based on these art teachers' experiences, it is evident that time management promotes self-regulated learning (SRL) for teachers and students. Ahmad Uzir et al. (2020) warned that ineffective time management results from low self-regulation. From a social-cognitive standpoint, establishing skills in SRL will help students achieve their academic goals. Learners' attitudes toward challenging and time-consuming assignments impact the strategies to apply throughout the process. External influences such as learning by observation, modeling after teachers or peers, and seeking guidance with feedback become the basis for SRL development (Bandura, 1997). Motivational components include self-efficacy behaviors, attributes, goal orientation, and intrinsic motivations that drive learners to address all aspects of a certain task with cognitive strategies (Schraw et al., 2006; Winne & Hadwin, 1998; Wolters et al., 2017).

CONCLUSION

Time plays an integral part in media arts education. However, time also poses constant challenges for teachers in learning and applying new technologies, making room in the curriculum for quality teaching, and keeping up with demands to align the curriculum with the standards. The experiences of these three art teachers revealed that time limitations, although challenging, are not an obstacle for the inclusion of media arts in the curriculum. The following suggestions for maintaining effective time management for quality teaching and learning have been synthesized from their experiences.

1. Divide time to maintain healthy student-teacher ratios. This will help establish strong relationships and allow more one-on-one instructional time.

2. Borrow time to provide guidance for students who may be unfamiliar with the technology.
3. Create time to promote collaborations among teachers and students to further utilize existing facilities and limited resources effectively.
4. Spend time to be curious and become a lifelong self-regulated learner to expand one's knowledge in teaching media arts. It is also important to focus on applying diverse approaches in pedagogy, motivating student learning, and building support systems across the curriculum.

In conclusion, the relationship between learning quality and the use of time is not a tug-of-war; rather, it is about balance. When students are motivated, they will be lost in time, immersed in the process of solving problems creatively.

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The Meaning of Animating in the Digital Era: Animation Education Practice in Japan

Taruto Fuyama

One change accompanying the current global evolution of online streaming and video-sharing platforms is the disappearance of the need to press the Play button. As an example, the action for watching TikTok videos on smartphones is “swipe” rather than “play.” This convenient function works well for passive viewing, but I argue that when art education is the aim we should be active and stick with play over swipe. Play evokes theater, and playful anticipation accompanies the rising curtain, as well as the play-back of moving images that we shoot as animation. In Japanese, the word for “play” is *saisei*, which has the magic-laden meaning of “coming back to life.” Progress in animation might involve the latest technology, but we still feel the pull of magical illusion when the Play button sends still images into motion. In media and film studies, Tom Gunning (2013) describes animation as playing between two poles, namely naturalism that reproduces and conveys movement found in the natural world, and magical metamorphosis that supersedes and transforms the way things actually

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exist. Making animation with an eye on both poles results in a way of handling motion that is at once analytic and magical.

Here, I broadly define the action of making animation, which encompasses these two contrasting poles, as animating. I deliberately avoid wording such as “making animation” and “watching animation,” with their tacitly presumed subject-object split, in order to handle animating as a mutually interactional activity for both subject and object. Within the vortex of animating, cognizance of the controlled versus the controller dissolves and we find ourselves literally animated. Animating practitioners are not so much craftspeople making instrumental use of technology as dancers or actors jesting with technology. In dealing with technology based on directives grounded in clear goals and plans, animating welcomes free improvisation and playfulness. The Play button for animating is not just a command to execute a plan, but rather a magic button that tickles curiosity for unpredictable potentiality.

This paper aims to rethink narrowly defined animation-making in order to concretely consider the broadly defined animating that flows beneath, and consider the meaning in terms of education. As background to this argument, the next section introduces several research findings from Japan, my home ground. Motion, collaboration, and play are introduced as key concepts. After a theoretical discussion of these concepts, I consider two workshops and personal experience in animation production and draw conclusions about the meaning of animating in terms of education.

ANIMATING AS ACTIVITIES OF MAKE-BELIEVE USING MOTION

As a prelude to discussing the practice of animating, this section introduces background on how animation has been handled in art education through concepts of motion, collaboration, and play, drawing on examples from Japan. Fuyama (2018, 2020a, 2022) shows that Japan has a relatively long history of animation education in elementary through high schools, with 120 instances in school art textbooks to date—animation subjects appeared in junior high school art textbooks as early as the 1950s. The content has changed with each era and notably diversified since the 2000s,¹ but one contradiction runs through the past half-century, namely

¹This diversification was informed by the addition of Image Media (*eizō media*) as a new element in the Education Ministry’s guidelines at the end of the 1990s (Ministry of Education, Science, Sports and Culture, 1998, 1999).

that while most materials treat animation as the representation of motion, there are rarely specific explanations about methods and knowledge for exploring that representation of motion. One must conclude that analytic approaches to the motion involved in animating have so far been neglected in Japan's art textbooks.

By contrast, two main approaches to motion can be found in previous research. The first succeeds Bauhaus basic design education and uses animation as a means for design education with motion as a design element (Motomura, 2003; Takahashi, 2006). The other approach uses animation as a way to observe and depict the motion of creatures in the natural world (Koike, 1996; Sahara, 2013). A handful of practitioners have made sporadic efforts with these approaches in Japan. In the future, research developments can be expected from the former approach in terms of hands-on basic education for visual communication and motion graphic design, and from the latter in terms of STEAM education linked with the natural sciences. The practices discussed below are mainly in keeping with the latter. In particular, approaches that emphasize physical involvement in image media as introduced by Osamu Sahara (2013) share the same direction with the exploratory practice of motion using the body discussed later in this chapter.

Next, this chapter explores research on the key concept of collaboration as it relates to animation. Hideo Aiba was an early practitioner of animation education in junior high schools, starting in the 1960s. He criticized the overemphasis on individuality in Japan's postwar art education and presented animation-making as an effective method for cultivating collective creativity (Aiba, 1964, 1967, 1984). However, Aiba's practice was predicated on role separation and dealt more with cooperation than collaboration. Conversely, some film educators who focus on children have pointed out that education based on division-of-labor cooperation emulating the film industry leads to hierarchical power relationships with the director at the top, which is not conducive to equal and polycentric communication (Tsuchida, 2014). Also, presuming roles such as director, screenplay writer, and actor results in each participant being treated as their role rather than as an individual, which means that each person can always be replaced with an alternative participant. Nobuhiro Suwa, a director known for his improvisational style, has raised concerns regarding this situation, and he has said that film education for children is valuable

because it reminds us that each person cannot be replaced by an alternative, and that each child is accepted as they are (Pia Film Festival, 2016). While Suwa works in live-action film, high school art instructor Kentaro Chiba (2007) remarks that he often sees shy students freely expressing themselves through animation, which shows the potential of animation as alternative performance (p. 142). In terms of collaborative work, Suwa's example from live-action film education emphasizes treating each participant as a unique individual for whom no alternative exists, and Chiba's example from animation education expects that the individual can flexibly try alternative identities. Suwa and Chiba share the educational aim of deepening one's understanding of the self and others through participating in collaborative production, but their assertions are contrasting. The possibility for flexible alternatives in animation education very likely brings freedom and ease that are unconstrained by one's real-world fixed identity, a point that will be revisited below.

Turning next to play, Japan's Education Ministry guidelines for elementary school art education have included "artistic play" (*zōkei-asobi*) since the 1970s, and educational practices linking material artistic activities with play have been studied (Fukuda et al., 2013); however, the relationship between animation and play has received little attention. Aiba (1975) is the exception in writing that the animation process cultivates playful attitudes through deviation from rigid planning, and in the 1970s he described animation as an effective opportunity to learn the importance of balancing play with planning in Japan's increasingly automated high-economic growth society. Furthermore, Aiba (1984) discusses play in conjunction with fictionality. He points out that animation is distinctive in clearly showing the fictionality of moving images, and he notes that if we can have students experience how animation is made and presented, then we can expect that students can understand what is made up and what is truth (Aiba, 1984, p. 101). Given current conditions in which truth and fiction intertangle, he noted the importance for children to be aware that all audiovisuals including animation and TV broadcasts are intentionally made up, and he saw animation creation as an effective educational method for that end. That being said, his practice did not only aim to teach literacy in order to critically decipher media. Rather, through engaging in animation-making with a spirit of play, his ideal was education that offered the contradictory experience of making animation as made-up representation while also enabling students to experience their own truth.

Anthropologist Gregory Bateson (1972/2000) writes that making play work as play involves the following message: “do not denote what those actions for which they stand would denote” (p. 180). Animals’ playful biting denotes the bite, but not what the bite denotes. Play only works when participants have a shared understanding of this logically contradictory metmessage. As Aiba (1984) points out, animation as a form of expression reveals its own fictionality; in other words, an animation sends the self-referential metmessage that actions within it do not denote the actions for which they stand would denote (p. 101). As Chiba (2007) notes, shy students can express themselves through animation, and this could be precisely because in animation-making it is easy to share the metmessage that “this is fiction,” and so it is possible to enjoy making/watching without the anxiety that accompanies self-exposure (p. 142). The paradox of being able to express one’s spontaneous true feelings seems to happen because fictionality is obvious.

Bateson (1972/2000) suggests that play as seen in animals develops into a complex intertwining of reality and fiction in the context of play, fantasy, and art at the human level. In the field of analytic aesthetics, this complexity is discussed in detail by Kendall Walton (1990), who analyzed various artistic activities as being fundamentally games of make-believe. He referred to prompts that encourage the imagination of fictional worlds with the function of props in games as representations and showed that it is possible to analyze works such as text and paintings on the same level as representations. Building on this concept, the practice in Aiba (1984) can be understood as collaboratively participating in believable imaginary worlds, even though they are nothing but made up, through the power of representations called animation (or the various objects used in the process of animating). Also, Walton (1990) referred to “objects of imaginings” as happening when a single object exists in both the real and imaginary worlds (pp. 43–44). When a child imagines a doll as being a baby, in the real world it exists as a doll while in the imaginary world it is really a baby. When making animation, the animator deals with actual drawings, clay, or other materials in the real world, but in the imagination they could have various existences as objects of imaginings. Furthermore, Walton (1990) argues that one of the most important objects of imagining is the self who does the imagining. We each have one body, but in make-believe we can live simultaneously in the real and imaginary worlds.

Returning to the above discussion about live-action film versus animation, from the vantage point of Walton’s objects of imaginings, something

that has no alternative in the real world can have alternatives in the imaginary world. In that sense, the live-action film and animation examples are fundamentally the same. Animation just allows more flexibility than live-action film when it comes to alternatives.² The fact that objects of imaginings exist simultaneously in the fictional and real worlds is important in terms of education. Objects of imaginings not only prompt imagination of the fictional world, but also serve as connectors between the real and fictional worlds. If that connection is lost, participants gradually get swept away into a virtual world disconnected from the real world, and expression/viewing is only meaningful as an escape from reality.

The above section focused on the three concepts of motion, collaboration, and play from discourse on animation in Japanese art education, and they are used as clues for discussing the issues of alternative identities and fictionality with reference to the theories of Bateson and Walton. Building on that discussion, I propose simply understanding animating as activities of make-believe using motion. I deliberately added the concept of motion because it seems to hold the key to magical experiences, as discussed in the opening with reference to Gunning (2013). Moreover, this chapter deliberately avoids technical terms such as “frame-by-frame” and “stop motion” because the evolution of digital technology has made such conceptual provisions meaningless. All methods give motion to various objects of imaginings and thereby open up the horizon of the imagination. A line or pebble can become a human being, bird, or moon with various kinds of motion. In order for those motions to prompt the audience’s imagination, one needs to observe and understand various kinds of motion in the real world. When such movies are played, and a pebble takes on an existence as something else, and we share it as a collaborative experience, then we become mesmerized by the magic of animation.

TWO BODIES IN ANIMATING

My education and animation production practices provide an opportunity to discuss animating in concrete terms. The first example centers on the Hands Animation workshop. In this workshop, groups of three to four people create as many stop-motion animations as possible in a short period

²In the digital era, live-action film can be manipulated frame-by-frame like animation, which eliminates the difference in the degree of flexibility. Given this situation, some assert that all films should be regarded as animation (Manovich, 2001).

of time using the hand as the only motif. In 2012, I developed the stop-motion software KOMA KOMA,³ which is optimized to quickly create short animations, so it is often used as a tool for the workshop. The software has a user-friendly interface and can replay short, animated loops, so even two frames are enough to work with. Groups can generate numerous animations in just thirty minutes or so. All of the groups' animations are gathered together and the participants are given the opportunity to watch each other's pieces and reflect on what they see. Then, each group is asked to select animations that they think are interesting. Each group comes to a consensus on evaluating the animations by expressing in their own words why and how they thought pieces were interesting. At the end, the groups take turns screening their favorite works and explaining what they found to be interesting.

The moving image of the hand photographed through stop motion generates various meanings. The hand can appear to be a creature with its own will, a plant, or a mysterious object. In the framework of make-believe theory, in *Hands Animation* the motif of the hand prompts various imaginings as imagined objects through the addition of motion. And in most situations, the animation appears somehow comical and elicits laughter from the participants. In doing the photography, the participants expose their hands, which are their familiar body, in front of the camera in order to do the animating, but their own hands seem unfamiliar in the finished animation. Indeed, they manipulate the images of their hands as actors that anonymously perform various roles.

Two conceptualizations of bodies in theater are useful for further discussion of the animating body. As discussed in the history of theater studies regarding the tension between the actor's body and the body of the role being performed, Erika Fischer-Lichte (2014) describes the former as the "phenomenal body" and the latter as the "semiotic body" (p. 26). Based on this contrast, in *Hands Animation*, our hands in the real world are the phenomenal body and the semiotic body is what is represented as various existences in the imaginary world. Among the diverse representations created, the animations that are deemed to be interesting often skillfully utilize the gap between the phenomenal body and semiotic body. A

³The KOMA KOMA stop-motion animation software is available for download on the App Store and Microsoft Store free of charge, and the web version was released in 2021 (see <https://www21.nichibun-g.co.jp/komakoma/app/>). For examples of KOMA KOMA in use (in Japanese only), see <https://www21.nichibun-g.co.jp/komakoma/case/>

certain kind of surprise results when the semiotic body pulls off something impossible on the phenomenal body. There, the phenomenal body serves as an anchor that secures the fluid semiotic body. This resembles the relationship of putting a kite into flight, as excitement emerges when the phenomenal body sends the semiotic body of the kite soaring higher. Hands Animation is a playful activity for enjoying the generation of various meanings through shooting the participants' phenomenal bodies and using the semiotic bodies created within the moving images. This is easy to understand as an activity of make-believe using motion through animation. Hands Animation is a curriculum that proactively plays with the semiotic body, but the important point is maintaining the link with the phenomenal body. In this workshop, our hands function as objects of imaginings, which serve as anchors connecting the imaginative and real worlds. Precisely because of that origin, many expressions can be freely explored within the infinite gradations between the semiotic and phenomenal bodies.

ANIMATING BASED ON THE PHENOMENAL BODY

Next I discuss Animation Boot Camp (ABC), an industry-academia-public sector workshop that I have conducted with animation producer Koji Takeuchi since 2012. Japan's Agency for Cultural Affairs has launched a number of training projects dealing with problems related to education in the animation industry, in which traditional apprentice-style, on-the-job training has ceased to function with the dramatic uptick in productions. ABC is one such project. Leading animators instruct young people aspiring to become animators in day-long or retreat-style workshops. In addition, the same method has been used to teach elementary through high school students, and the workshop goes beyond specialized animation training with potential as a general educational program for a wide range of ages.

The ABC in part traces its roots to Studio Ghibli, which is led by one of Japan's leading animation directors, Hayao Miyazaki. In a discussion with a producer, Miyazaki describes how Japanese animation is threatened because young people today have a deficit of physical memories (memories connected with the phenomenal body) (Suzuki, 2008). To counter this situation, they set up the West Ghibli training studio for novices in Toyota City, Aichi Prefecture, in 2009, and twenty-two people were selected from nine hundred applicants for an eighteen-month practical training

program. Animator Takeshi Inamura was in charge of education at West Ghibli, and he is also involved in curriculum development for ABC.

Miyazaki's ideal is basically sensuous and physical movement (Suzuki, 2008). We can feel the pleasure of flying when characters in a Ghibli film fly through the air. When characters in a Ghibli film eat, we also savor the feeling of enjoying a delicious meal. Ghibli films go beyond visuals to stimulate composite sensations that include smell, taste, touch, and movement, and those multisensory visuals have captivated people worldwide. Technique alone is not enough to realize this kind of sensuous, physical movement. The technique comes along later. Rather, the key lies in the fundamentals of expression, namely, richly imagining movement that is grounded in physical memory and using that as the basis for drawing animation. Expression must be based on experience gained through interfacing with the material world, and bodily and sensuous movement cannot emerge from expression confined to the imagined world. However, Japanese anime relies on the use of various stereotyped patterns, and young people who join the animation industry because they love anime find themselves unwittingly content with imitating the patterns created by their predecessors (imitations of the semiotic body). But, simply inheriting patterns diminishes animation expression, just as the copy of a copy deteriorates. Miyazaki's sense of crisis was reflected in West Ghibli, where Inamura was in charge of the in-house training program. After West Ghibli ceased operations, Inamura was involved in the launch of ABC. Thus, an aspect of ABC's origins can be traced back to West Ghibli.

The actions in the assignments for ABC participants are all simple, such as standing up, lifting something, straddling something, and walking while carrying something, or passing along a ball. On the surface, it might look like the participants are learning patterns, but the instruction taking place is in fact otherwise. ABC instruction can be broken down into three phases:

1. Establish the image for the movement (performance) as felt with the phenomenal body.
2. Express that image through animation.
3. Check the animation and show it to others.

The basic structure is working in groups to do numerous iterations of Phases 1 and 2, and then 2 and 3.⁴ The critical point for Phase 1 is feeling with the entire body. Taking the example of lifting a heavy object, this means sensing within your own body where you exert energy, how that energy is transmitted, and the location of your body's center of gravity. That subjective sensation of movement becomes the core of expression. The critical point for Phase 2 is creating lots of thumbnail sketches to search for poses. There, students start with searching for the poses that best represent the movement (key poses). In that exploration process, participants also receive feedback from instructors and group members. After students make some progress with Phase 2, they move onto Phase 3 to check the movement through animation line tests. The key point for Phase 3 is not assessing the quality of the animation per se, but rather for viewers to convey their honest impressions to the creator; for example, "this is how it appeared to me," or "I felt like it is such-and-such kind of movement." The use of sound symbolism is recommended.⁵ In ABC, creators use various sound-symbolic words as a shared language to express motion, and the creator grasps the gap between the intended and perceived image of the movement, and at that point the creator returns to Phase 2 to begin work on revisions. In ABC, most of the time is devoted to having students do as many iterations as possible between Phases 1 and 2, and then Phases 2 and 3. Professional animators provide appropriate scaffolding to ensure that students stay engaged and follow through with tasks. For the screening of the final works, the participants are asked to use their own voices to produce sound symbolism along with the animation. It's like a live performance.

The ABC curriculum demands that the participants always rely on their phenomenal body. Inamura often advises them to figure out the answer using their body because it can't be found on their desk. In the ABC assignment, participants animate the semiotic bodies of little boy and girl characters designed by Inamura, but they always refer to their own body as the basis for imagining those characters. And at the final screening, participants add their own vocal sound-symbolic performances to the

⁴Phase 2 sometimes uses three-dimensional computer graphics (3DCG), not just analog/digital 3D hand-drawn animation. Also, as an experiment, participants using pencil and paper learn alongside those using 3DCG.

⁵The Japanese language has abundant sound symbolism in the form of phonomimes (onomatopoeia), phenomimes, and psychomimes (Makino & Tsutsui, 1989, p. 50).

semiotic bodies that they drew, which enables them to experience the connection between phenomenal and semiotic bodies (or to recognize the disjuncture). This screening approach is quite likely fresh for the audience, and it must feel odd to view performances co-created by the animated semiotic body and vocalized phenomenal body. These endeavors show that ABC is much more than a specialized workshop teaching animation techniques.

ANIMATING AS UNDERSTANDING OTHERS

In the ABC example above, learners in their twenties try to animate a six-year-old boy or girl character. In my point of view, that process is fundamentally about understanding others. Here I elucidate this assertion through describing personal experiences as an animator.

I worked in animation production in the 1990s and first recognized the depth of meaning within the animation process while serving as an animator on the CG animation film *The Fisherman and His Wife*, directed by Hungarian media artist Tamás Waliczky (2000). I was mainly in charge of a lengthy ninety-second sequence of two cranes dancing, a difficult scene in which the relationship between the birds served as a metaphor for the relationship between the protagonist fisherman and his wife. The director gave instructions for the overall emotional arc and left the details of the performances up to me.

First, I went to observe cranes at a zoo and spent an entire day memorizing visuals of various crane movements. Those visuals were quite useful as references when animating the cranes, but the director wanted performances that expressed human emotions, so the visuals could not be used just as they were. Trial-and-error led to the realization that it was not enough to rely solely on the reference visuals; rather, I needed to feel like a crane when creating the performance. Of course, the human body bears little resemblance to the crane's long neck, giant wings, and skinny legs, so imagination fills in those gaps. The key is to ensconce oneself in the world felt physically by the crane. That is to say, having the will to overlap one's own perspective with that of the crane ("perspective" here in the sense of one's take on the world with some particular intentionality) and aiming to generate the performance through the collaborative work of the animator's and crane's bodies. After adopting that approach, I discovered unprecedented gratification amid the demands of the animating process. Drawing on the two contrasting types of bodies from theater studies, I

initially dealt with the crane as a semiotic body using reference visuals, and the crane was disconnected from my own phenomenal body. However, I gradually came to recognize the gratification of understanding the crane's phenomenal body through my own phenomenal body.

In animation, the phenomenal body that performs the semiotic body is not immediately obvious, as is the case in theater and live-action film. As a result, the animator's phenomenal body is easily overlooked. However, great animators actively utilize their phenomenal body in the process of animating, as seen in director Katsuhito Ishii's (2004) film *The Taste of Tea*, in which the elderly legendary animator frequently uses his own body to explain the look and feel of the movement (which is precisely what the ABC instructors do). What happens when the range of performed semiotic bodies extends beyond humans to include creatures, insects, and inanimate objects? Reliance on imitating the semiotic body or simple anthropomorphism based on one's own phenomenal body produces overly simplified anthropocentric results. The semiotic body needs to be superimposed on the phenomenal body in order to literally animate the activity of animating and turn it into a process that generates enriched meaning. With this approach, animating can become a process of learning to understand others through superimposing one's own body on a diverse array of subjects, including people, nonhuman animals, and inanimate objects.

This kind of imagination is also related to "imagining *de se*," defined as "imagining from the inside" in Walton's (1990) theory discussed above. Imagining through the phenomenal body requires imagining *de se* in which you imagine doing something from within. In other words, in the process of animating the cranes, I realized the importance of combining imagining *de se* with observing the cranes' bodies analytically. In that process, I experienced the connection between my own body and the crane's body.

When it comes to animating, imagining *de se* potentially deals with everything and anything. Yoshimi Itazu one of the ABC instructors, commented that "animation is most fun in the moments when I understand that everything under the sun is connected with my own body, and that realization keeps animation interesting for me" (Fuyama, 2020b, p. 41). According to Itazu, when drawing the movement of animation and using your own body as a reference, the animation that you draw becomes very close to yourself. This holds true when the subject matter being drawn is a natural phenomenon, as "you need to realize that you can express what

you experience on paper; that you aren't drawing the wind, but rather you are drawing the physical sensation of feeling the wind" (Fuyama, 2020b, p. 41). If animating affords the opportunity to reconsider the relationship between one's own body and the universe at large, it arguably has tremendous educational potential in renewing one's way of recognizing the world.

EDUCATIONAL SIGNIFICANCE OF ANIMATING IN THE DIGITAL ERA

This chapter has considered the educational significance of animating based on defining it as activities of make-believe using motion. Here, I draw conclusions about the central question posed in this paper, namely the significance of animating in education, as follows: Animating prompts us to imagine fictitious worlds as seen from diverse perspectives through the representation of motion, which is furthermore represented as moving images and encompasses the experience of sharing those images with others. This process is significant for art education as a practice that encourages the understanding of others, and furthermore the feeling of being connected with the world. However, the condition is as follows: the phenomenal body of the subject who does the representation cannot be separated from the semiotic body that is being represented. The mutual interaction needs to be maintained, and the significance of the process lessens as the tension in that relationship dissipates.

What are issues for future consideration, and what is the significance of animating to them? The prevalence of digital technology creates conditions in which anyone can make animations with relative ease, and so the gateway to animating has undoubtedly expanded. But, obstacles also emerge from the convenience of digital technology. One example is the acceleration of passive viewing as seen in the change from play to swipe, and many steps in production are also becoming automated. In everyday situations, emails and social media use moving emoticons and short videos with animation effects are sent back and forth, and this shared language has penetrated our lives on a global scale. In production, the frame-by-frame creation of movement that was the basis of animation production is no longer necessary, and it is possible to automate the playback of motion and create your own characters with a few steps. Of course, there are positive aspects to the global expansion of communication using animation based on the semiotic body and new possibilities of expression that play

with the body created automatically by artificial intelligence (AI)—I would like to propose calling this the “algorithmic body.” But, I am also concerned about decreasing opportunities for awareness of the phenomenal body to anchor the semiotic body with the self in the process of representation, and opportunities to bring forth imagining *de se* that is based on that awareness. As a result, the tension between the semiotic body and phenomenal body dissipates and the need to exercise imagining *de se* in the process of expression disappears, which can lead to taking everything to be someone else’s affair and irrelevant to oneself.

In terms of the practice of animating in art education in the digital era, teachers need to be cognizant of instruction that makes learners recognize their own phenomenal body and the importance of instruction that encourages receptivity to the phenomenal body of others through imagining *de se*. If expression is based on those premises, even the most absurd animation will have meaning for participants as being connected with the self. For animating education in the digital era, animators as the subjects that do the representing should not be treated as god-like universal creators who generate fictional worlds using the power of technology. They need to be understood as creative learners who are semi-passive and semi-active as they play with representation in the intersection between the make-believe and real, and they renew their own perspectives while interacting with the world that includes others. Only with that premise can animating be an effective approach to art education that makes the relationship between technology and people convivial, playful, and animated.

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New Media Arts Education at the Institute of Advanced Media Arts and Sciences

Masayuki Akamatsu and Jean-Marc Pelletier

The International Academy of Media Arts and Sciences (IAMAS; now the Institute of Advanced Media Arts and Sciences) opened its doors in 1996 as the first school specializing in media arts in Japan and celebrated its twenty-fifth anniversary in 2021. This quarter-century of education at IAMAS can be characterized by the notion of duality: science and art, intellect and sensibility, Japan and the world, urban and rural, global and local, nation and region, institutions and individuals, and top-down versus bottom-up approaches. The people who have gathered at IAMAS over the years have struggled with the tension and fusion of these dualities. By looking back on the history of IAMAS, we hope to provide some insight on the development of global media arts education within the context of this Japanese institution. Indeed, the changes during this quarter-century

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at IAMAS reflect a general shift from an institutional approach to media arts to one that is more centered on individual creators, students, and educators.

AN OVERVIEW OF IAMAS

IAMAS was founded in 1996 as a public specialized training college (*senshū gakkō*) by Gifu Prefecture in Ogaki City. The acronym IAMAS has been used to refer to two separate institutions. The first is the specialized training college, the International Academy of Media Arts and Sciences, which we will refer to as the “Academy.” The second is a graduate school, the Institute of Advanced Media Arts and Sciences, which opened its doors in 2001 and which we will refer to as the “Institute.” While these were separate institutions, they shared the same campus and, day to day, largely functioned as a single school, which we will refer to as “IAMAS.”

Table 20.1 presents a timeline of the history of IAMAS. The Academy originally offered two programs, the Art and Media Lab and the Multimedia Studio—each lasting two years. The Institute’s master’s program came to replace the Art and Media Lab, which closed in 2002. The Multimedia Studio program remained until the Academy closed its doors in 2012, leaving only the Institute, which continues its activities to this day. At this time, the number of full-time faculty members was reduced from 28 to 19 and the number of students from 100 to 40. In 2021, a PhD program was newly opened, and the student capacity increased to 49. First housed in a repurposed high school building, which was later expanded with two new buildings, IAMAS moved to Softopia Japan, an industrial park dedicated to information technologies, in 2014.

IAMAS OVER THE YEARS

Higher Education in Japan

When the first steps that would lead to the foundation of IAMAS were taken in October 1992, the purpose of the new school was still considered to be essentially technical. What would become IAMAS was thus envisioned as a specialized training college. In general, Japanese higher education offers three paths for students holding a senior high school diploma: four-year university programs, two-year junior colleges, and specialized

Table 20.1 Timeline of the Institute of Advanced Media Arts and Sciences (IAMAS)

1990	The “Softopia Japan Master Plan” is established by Gifu Prefecture.
1992	Gifu Prefecture plans the creation of a new school, the Advanced Information Technology Academy GIFU.
1995	The first World Forum for Media and Culture is held in Ogaki City (held biennially until 2001).
1996	The International Academy of Media Arts and Sciences is founded as a specialized training college with two programs: the Art and Media Lab and the Multimedia Studio. The artist-in-residence program is started (–2009). The Softopia Japan Center Building is completed.
1997	An exchange student agreement is made with the University of Southern California, USA (–2000).
2000	An exchange student agreement is made with Dartmouth College, USA (–2003). The Multimedia Studio program is reorganized into a four-course program (Advanced Network Design, Computer Generated Image, Designing for Information Technology, and Dynamic Sensory Programming).
2001	The Institute of Advanced Media Arts and Sciences is established as a separate graduate school on the same campus. Both the Academy and the Institute use the acronym IAMAS. The Institute’s Media Creation Department had a system of four studios: Interactive Media, Time-based Media, Interface, and Media Aesthetics The Cultural Media Center (CMC) is established.
2002	The Academy’s Art and Media Lab program is closed.
2003	An exchange student agreement is made with Ravensbourne College of Design and Communication, UK (–2006).
2004	The first edition of the Ogaki Biennale (now Gifu Ogaki Biennale) is held. IAMAS takes part in the Campus Exhibition at Ars Electronica Festival.
2005	An exchange student agreement is made with the University of Art and Design Linz, Austria.
2006	An exchange student agreement is made with the Srishti School of Art Design and Technology, India (–2009). The Media Creation Department adds a new studio (Engineering).
2008	The Guest Researcher System is started.
2010	The CMC is reorganized into Research Center for Industrial Cultures (RCIC).
2012	The Academy is shut down as part of Gifu Prefecture’s “Action Plan.” The Media Creation Department changes from a studio system to a curriculum organized into three research fields: Art, Design, and Community.
2014	The school is relocated to the Softopia Japan complex. The research fields are absorbed into a new project-based and team-teaching system.
2021	The PhD program is established.

training colleges that offer programs of one to four years. (There are also colleges of technology for students who have graduated from junior high school.)

Specialized Training Colleges

According to Article 124 of the Japanese School Education Law (1947), specialized training colleges serve the purpose of teaching the necessary skills for employment and daily life. Students in specialized training colleges overwhelmingly enter shortly after graduating from senior high school, around the age of 18. In 2016, 74.9 percent of enrolled students held a senior high school diploma, while only 4.1 percent were graduates from four-year university programs (Metropolitan Tokyo Professional Institution Association, 2017). As the focus of these schools is to provide professional training, everyday life skills, and general knowledge, university graduates who enter them typically do so with an eye on acquiring practical and technical skills for future employment. The programs are greatly varied, with vocational training in healthcare being the most popular.

Officially created by a 1976 amendment to the School Education Law, specialized training colleges grew from the largely unregulated “miscellaneous schools.” While the law provided a clearer framework, specialized training colleges retained a high level of freedom in setting their curricula. Kurauchi (1980) cites flexibility, variety, and practicality as the defining characteristics of education in these colleges. Rapidly changing technology and a growing Japanese economy meant an increasing demand for skilled labor that neither secondary education nor universities, which were perceived as rigid and focused on theory rather than practice, could provide.

Foundation and Objectives

The Academy was founded in 1996 under Gifu Prefecture’s information technology policy, which was originally formulated in 1990. As a specialized training college, the Academy opened with the vocational purpose of educating skilled creators who could support the coming information society, and help the diffusion of a new culture through the development of visual media industries. The Institute and its master’s program were later created with the goal of rethinking the creative process from a broader perspective, fusing science and technology with artistic creation informed by a philosophical and intellectual outlook to foster this new culture. Both

schools shared the objective of integrating science and technology with art. The Institute's current mission statement has the following five objectives:

1. Educating outstanding and independent students
2. Promoting forward-thinking research
3. Connecting alumni working in Japan and abroad
4. Fostering a generation of innovation leaders
5. Creating and developing value with local communities (IAMAS, n.d.).¹

In retrospect, these objectives neatly summarize the twenty-five years of research and creation at IAMAS, and while these objectives may not have been explicitly stated in the early days of IAMAS, they have nevertheless guided educational practice from the start.

From Textiles to Digital Media

IAMAS is located in Ogaki, a city of approximately 160,000 residents in central Japan, some three hours by train from Tokyo and two hours from Osaka. The city's textile industry had prospered in the early twentieth century, but in the 1970s it started to rapidly decline owing to competition from cheap products imported from China and elsewhere, as well as a general transition in Japan from heavy to light industries. The region further suffered from its slow response to these challenges. It was only in the early 1990s that a plan to stimulate the local economy by investing in information technologies was established, leading to the creation of IAMAS. This shift from textile manufacturing to digital media is nicely symbolized by the original campus of IAMAS—a renovated building of the former Ogaki Daiichi Girls' High School, a part-time senior high school that had accommodated the shifts of women working in the local textile factories.

The Academy

Although the freedom afforded by specialized training colleges should make them fertile grounds for teaching experimentation, this has largely been negated by their strong focus on practicality. However, in the early

¹These objectives have been translated from IAMAS's Japanese website by the authors.

1990s, when Gifu Prefecture decided to focus on technologies such as the internet or computer graphics, there were still no real demands to answer; the local industry did not exist yet. This perhaps made it possible for the elaboration of a radically different school, at least in a Japanese context. Freed from the need to respond to the needs of an existing economy, the founders of IAMAS could create a school where students and faculty could imagine a new future.

The most fundamental break with the typical Japanese specialized training college model was the choice to offer two programs. The Multimedia Studio was, on the surface, a more traditional vocational program, whereas the Art and Media Lab program required a bachelor's degree for admission. In Europe and North America, media art education was starting to become formalized. Schools such as the Städelschule's Institute for New Media, Karlsruhe University of Arts and Design, and the School of Visual Arts New York City served as a model (Sakane, 2013), which was made possible by the freedom given to specialized training colleges in establishing their curricula.

The Art and Media Lab program was unusual in that it created an explicit path from undergraduate studies back to postsecondary studies. It was even more unusual in that its curriculum resembled far more that of a graduate school than that of a typical specialized training college. Founding IAMAS as a graduate school was indeed considered, but as a new institution, and considering the short time frame of the planning period, an accreditation from the Ministry of Education would have been unlikely.

The Multimedia Studio and the Art and Media Lab Programs

The two programs offered during IAMAS's early years were targeted at different age groups and were expected to serve slightly different purposes. The Multimedia Studio program was aimed at senior high-school graduates over the age of eighteen, and the Art and Media Lab program was offered to students over twenty-two holding a four-year university degree. The Multimedia Studio program in particular, according to the strong wishes of the prefectural government, was expected to fulfill the role of a regional vocational school and produce alumni that could join the local workforce. However, surprisingly, many of the students in the Multimedia Studio program were university graduates or had prior work experience. Almost one-third of all students who entered this program between 1996 and 2005 (91 students out of 283) held a university degree.

Thus, both programs taught artistic creation and technological innovation to students of diverse age groups. Moving beyond the framework of a vocational school that would only teach existing technologies or manners of thinking, IAMAS sought to educate the pioneers of a new culture and society.

A Period of Experimentation

IAMAS welcomed its first students in April 1996. Owing to a generous budget, those early students were met with state-of-the-art equipment and a faculty with diverse backgrounds. While the curricula had been elaborated with an eye on what was being done abroad, there were few if any models in Japan to guide its educational approach. The period between 1996 and 2000 was thus one of experimentation, with major curricular changes introduced every year. In its second year, the Multimedia Studio program was restructured into eight specializations (design, computer graphics, virtual reality, music, network, video, programming, and spatial design) and the Art and Media Lab program introduced seminars. The following year, in 1998, adjustments to the curriculum were again needed; there were too many programs for such a small school, and the rather traditional seminars, headed by each faculty member, were ill-suited for collaboration and interdisciplinary work. Hence, the number of specializations in the Multimedia Studio program was reduced to four, and the Art and Media Lab program was transformed with six seminars headed by up to three faculty members each. In Japan's universities, seminars are common but such a collaborative approach was largely unheard of. In the next two years, further adjustments were made but the general structure of both programs remained the same. Superficially, their curricula were separate, but in practice there was little qualitative difference between the two; they shared the same faculty, the same space, and the same mission.

The Core Characteristics of Education at IAMAS

In the first few years of IAMAS, there was still significant doubt as to what was the most effective method of teaching media arts, and major changes were made to the curriculum every year. Nevertheless, within these changes there were a number of important characteristics that have remained throughout the school's history. The first is the very high student-teacher ratio, hovering between two and four students per

full-time faculty member, allowing for teaching centered on small groups and individual tutoring. The second is the importance given to collaborative work between faculty members and students of diverse backgrounds. Furthermore, while official classes have been held from morning to evenings, all school facilities are open twenty-four hours a day, every day of the year. In fact, students frequently stay well into the night working on their research or artworks, or even simply socializing. This free use of the campus, almost as a living space, was encouraged and supported by facilities such as an infirmary, a kitchen, showers, and a large nap room.

IAMAS's International Identity

From its inception, nascent media arts education in European and North American schools served as a model for IAMAS, which embraced a strong international identity. In practice, this meant inviting lecturers from abroad to lead lectures and seminars, as well as hiring full-time faculty to teach English conversation and writing. IAMAS also welcomed students from Europe, North America, and Asia, and established student exchange programs with universities abroad. Artists and researchers visiting from overseas frequently held lectures and workshops, and an artist-in-residence program allowed students to collaborate with established artists taking part in long-term stays. Students and faculty were encouraged to present their works abroad, several of which have won prizes in major international competitions such as Prix Ars Electronica.² This enthusiasm for international education was highly unusual for a Japanese specialized training college.

Facilities

In order to implement its mission of bridging science and technology with art, IAMAS was equipped with state-of-the-art facilities. Students had access to high-performance computers such as 3D graphics workstations; network servers; a high-speed, high-bandwidth internet connection; fully equipped video, sound, and graphic design studios; and a variety of

²Over twenty artists have produced works at IAMAS that received mentions at the Prix Ars Electronica, including Masahiro Miwa (Golden Nica 2007); Haruki Nishijima (Golden Nica nomination 2001); Akio Kamisato, Takehisa Mashimo, and Satoshi Sibata (The Next Idea winner 2004); and several honorary mentions over the years.

specialized software. Much of this technology was far too expensive to be accessible to young individual creators, and very few educational institutions, or even professional studios, were so richly endowed. In its early years, many students came to IAMAS specifically attracted by this environment. However, the cost of technology fell as rapidly as its performance increased, and by the time IAMAS celebrated its tenth anniversary, it had lost its material advantage as many other schools in Japan had become equipped with similar facilities.

The Institute

In 2001, the Art and Media Lab program was replaced by a new graduate school, the Institute of Advanced Media Arts and Sciences. Specialized training colleges afforded freedom of experimentation, but the educational approach was becoming clearer, and the Art and Media Lab program being all but a graduate school, it became important to offer a proper master's degree.

The Art and Media Lab's seminars became "studios," but the concept was fundamentally the same. Students and faculty were grouped in broad research areas: interactive art, time-based media, interface design, media aesthetics, and after 2006 an area dubbed "representation engineering" that focused on technological innovation. The separation of IAMAS into two distinct schools had several practical consequences. Despite sharing a campus, the Institute and the Academy had to keep separate faculties and the Ministry of Education had now much greater oversight over the Institute. Classes that brought students of both schools together had to be dropped, although students did continue to participate informally in collaborative projects.

The Multimedia Studio program remained, but its four programs became more independent, with separate admissions and their own faculty members. The intense period of experimentation of the 1990s at IAMAS mirrored in fact the exploration that was happening in the world at large. By the 2000s, however, the vision of what computer graphics or the internet were capable of and what teaching those technologies entails became clearer. In a short two-year program, there was a need for greater specialization, both for students and faculty. Nevertheless, the Academy never became a traditional specialized training college. Admission of university graduates remained high, and the general culture of experimentation and teaching for the future continued.

Local Engagement

Over the years, works produced at IAMAS were frequently presented abroad or in large cities like Tokyo. Meanwhile, many students sought work outside Gifu Prefecture after graduation. This led to IAMAS being sometimes sarcastically referred to as “internationally famous, but unknown at home.” While this was due in part to a lack of opportunities in Gifu, as a public school this perceived lack of local engagement became an object of criticism. As a response, IAMAS began joint research projects and started sharing information with local businesses. Furthermore, artistic and technological events grounded in local communities, as well as workshops for local high school students became more common. In order to further benefit the local region, the Center for Media Culture (now called Research Center for Industrial Culture) was founded in 2001 with the mission to facilitate industry cooperation and regional contributions.

A New Campus

By 2012, much had changed since IAMAS’s conception in the early 1990s. The Gifu prefectural government, facing serious financial difficulties, undertook budgetary reforms that ultimately led to the closing of the Academy. Why the Academy and not the Institute? In part because the Institute’s status as a graduate school accredited by the Ministry of Education would have made it difficult for the prefectural government to close it unilaterally. Ironically, the Academy fell victim to the lack of ministerial oversight that allowed it to experiment and flourish. Furthermore, its contributions to local society were never fully appreciated, making it an easy target of government austerity.

Two years later, the Institute moved to Softopia Japan, as its original building was aging and would have required significant investment to meet building standards. Filling unoccupied spaces in Softopia’s industrial park, the facilities were now split between two buildings some two hundred meters apart. While this arrangement had its inconveniences, students were more limited by having less freedom in how they could use this space. The move to Softopia was accompanied by an educational shift to a curriculum entirely centered around projects where groups of students and teachers collaborate.

In recent years, education at IAMAS has shifted back to individual seminars. In a project-based approach, there is always a certain amount of

difficulty in reconciling each student's interests with the relatively narrow focus of the project they belong to. While seminars headed by individual teachers were at the center of the curriculum in the 1990s, the current approach differs in that research is now led by student ideas rather than teachers' interests. Throughout its numerous curriculum changes, IAMAS has experimented with media arts education centered on broad fields, narrow research topics, faculty interests, and student ideas. In a way, perhaps, this change in academic approach reflects a global movement from top-down structures to bottom-up approaches in media arts.

IAMAS's Academic Approach

IAMAS research and undertakings with direct connections to local society and industry have become even more commonplace. It was partly with an eye on industry cooperation that the school moved to an industrial park. This was not so much a change in direction, but rather a return to the vision that led to the school's creation. At the same time, the type of media art that was produced at IAMAS in the 1990s had achieved popular success, while new technology was now consumed in an instant and its cost dramatically reduced. In this context, as indicated by the creation of a doctoral program and the increase of activities outside the campus, IAMAS focused its academic research and social endeavors around the concept of "wisdom through creation." IAMAS has moved from a vision of media art as a use of technology to one where media art critically interacts with society. On a superficial level, this is readily apparent by comparing the curriculum of the Academy in 1997, which had several classes dedicated to specific technologies and software like Houdini, Macromedia Director, or C programming, with the projects that are at the core of the 2021 IAMAS program, which tackle topics such as community resilience, technology for welfare, or approaches to art archiving.

As mentioned above, IAMAS can be said to have been the product of dualities. Facing local economic challenges, the prefectural government saw a possible answer in emerging information technologies. These technologies were, however, eminently global in nature. In order to sustain this new economy, a skilled workforce was needed. While there was a need to offer technical proficiency, true global leadership required creativity and artistic sensibilities. This duality between local needs and a global viewpoint, as well as between technical proficiency and creative acumen, was at the core of IAMAS's first president Itsuo Sakane's (1986) research, and is

clearly expressed in the name of the school. The Academy was, according to its name in Japanese, Gifukeritsu Kokusai Jōhō Kagaku Geijutsu Akademī (literally, “Gifu Prefectural International Information Science Art Academy”), both prefectural *and* international, and an academy for both information science *and* art. Hence, much of the activity at IAMAS can be framed as an attempt to reconcile these apparent contradictions.

COLLABORATIVE PROJECTS AT IAMAS

Despite the numerous institutional and curricular changes, collaborative projects have always played an important role at IAMAS. These projects are at their core collaborations between faculty members and students, but they also frequently involve other actors outside the school. There have been collaborations with cultural institutions inside and outside Japan, as well as local businesses and communities. By looking at three representative projects, we can highlight how global media art trends influenced education in Japan, and show how the nature of collaborative work has evolved over the years at IAMAS.

Multimedia Installations for the Hon’ami Kōetsu Exhibition

One of the largest and most notable projects of the 1990s at IAMAS revolved around the work of artist, potter, and calligrapher Hon’ami Kōetsu³ (1558–1637). An exhibition of his work, *The Arts of Hon’ami Kōetsu, Japanese Renaissance Master*, was held at the Philadelphia Museum of Art from July to October 2000, and two interactive devices were developed by IAMAS faculty and students, under the direction of Professor Yasuhito Nagahara, between 1998 and 2000. The first device allowed visitors to view the *Handscroll with Poems of the “Sanjūrokkasen” (Thirty-Six Immortal Poets) with Design of Cranes* in a fashion that replicated the action of unrolling the actual scroll. The second device enabled visitors to manipulate a 3D-printed replica of a black raku teabowl called “Shichiri” (seven leagues) to control the display of a 3D scan of the original (Fig. 20.1).

This project was representative of the institutional nature of much media art up to this time. Teachers, students, artists, engineers, and

³Following common practice for pre-Meiji (pre-1868) figures, this name is given in traditional Japanese order, family name first.

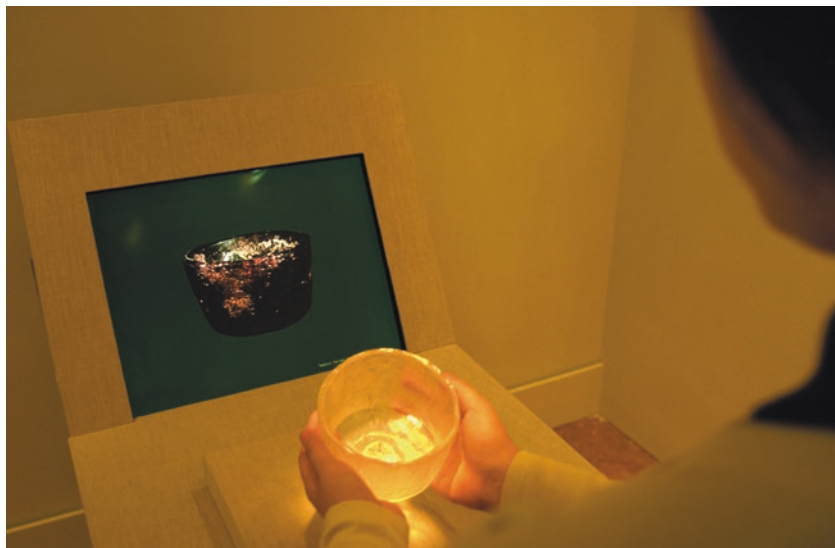


Fig. 20.1 The interactive teabowl device (2000) developed by IAMAS faculty and students. Photograph by Nobuya Suzuki. Reproduced with permission.

curators from IAMAS, the Philadelphia Museum of Art, the Gotoh Museum, the Gifu Prefectural Museum, and the Kyoto National Museum participated with support from the Gifu prefectural government and several businesses. Even relatively small-scale installations such as those created for this project required access to technology, like stereolithography and 3D scanning, and knowledge that was hard to find outside a very small number of institutions across the world. The function of institutions like IAMAS was to attract people (both faculty and students) and financial investment to achieve the critical mass necessary for new media research and creation to happen.

Most of the early centers for media art creation and research were located in Europe and North America. While modeled on Western institutions, IAMAS was also unmistakably Japanese. The Hon'ami Kōetsu project highlights the importance of cultural and geographical diversity. The very notion of an art “exhibition” is fundamentally rooted in a view of art as a primarily visual experience. However, in the Japanese tradition, artifacts such as handscrolls or teabowls are experienced actively and

gesturally. The act of unrolling a scroll or the tactile sensation of holding a teabowl is essential to their function as cultural and aesthetic objects. A *functional* (as opposed to an *object-centered*) approach to curation (Loulanski, 2006) centered on “societal processes of acculturation and socialization” (Müller, 1998) would imply that these artifacts cannot be isolated from their usages. However, conservation makes the necessary physical access to the original objects impossible. Media art presented itself as a possible solution to this problem, and utilized the interactivity of digital technologies to share some sensibilities with the performative nature of Japanese art. In this way, for the sake of cultural diversity, the establishment of new media art institutions outside of the Western cultural sphere was and continues to be necessary. True global media arts cannot exist without a plurality of cultural perspectives.

MIRAGE: Computer Vision for Artists

By the time the Institute saw its first graduates in 2003, the access to digital technology had significantly progressed. Artists working with digital media needed to rely less and less on expensive and specialized equipment. In the context of increasingly powerful laptop computers and cheap web cameras, a new project looking at the potential uses of real-time computer vision technology in the arts was started by us in 2005, lasting until 2007. Although we were two teachers from the Academy, many of the students participating in the MIRAGE project were from the Institute. Research projects were one of the ways in which students from the Institute and the Academy were given an opportunity to work together.

Computer and machine vision has a long history of being used in media art, notably by artists such as Erkki Kurenniemi, Myron Krueger, and David Rokeby. By 2005, while fast computers and dedicated machine vision cameras were easily accessible, there were still few tools for artists. (Exceptions like SoftVNS, Bigeye, EyesWeb, and cv.jit all had various technical limitations.) This project also notably took place before major breakthroughs in neural networks that would radically change both the applications and public perception of computer vision. Hence, with MIRAGE, we were looking at technology that was somewhat accessible but not generally widespread in the public sphere yet. In three years, students and teachers worked together on a number of interactive installations and the development of supporting software, culminating in a large collaborative contemporary dance performance, *Tōsei no Shintai*, held at

the Hyogo Performing Arts Center in January 2007 (Pelletier & Akamatsu, 2014), where computer vision was used to capture the movement of dancers to generate music and visuals in response to their improvisation.

The MIRAGE project's approach was similar in essence to much of the early research in media arts since the 1960s. Projects like Experiments in Arts and Technology (E.A.T.) had brought artists and engineers together to explore how advances in new technology could be applied to artistic expression (Martin, 2015). IAMAS was originally conceived with a similar idea: a school for both engineers and artists. There were no engineers in the MIRAGE projects, however. From the start, only a minority of students came to IAMAS from engineering or scientific studies. Yet by 2005 it was clear that a certain paradigm shift had occurred. New technology, and more importantly new knowledge, was infinitely more accessible than it was in the late 1960s or even in the mid-1990s. At IAMAS and elsewhere, media arts practice had shifted from one often based on dialogue between art and science, to one of technologically and scientifically literate artistic creation. For instance, early media arts projects such as E.A.T. or institutions such as the Institut de Recherche et Coordination Acoustique/Musique (IRCAM) were founded on collaborations between people who singly belonged to groups such as scientists, engineers, artists, or musicians. By the mid-2000s, these boundaries were much less clear and media art became more centered on the work of polyvalent creators.

Technological literacy takes various forms. In the small microcosm of the MIRAGE project, some members were implementing recent techniques, building tools for other creators. Others were exploring the creative potential of these tools, and others were thinking about the impact this new technology might have on society. All of these activities were centered on creation, everyone was an artist who could engage with technology more directly, without significant institutional support. Media arts education was moving away from the training of specialists who could collaborate with other specialists. More and more, teaching was centered on the process of investigation and inquiry. In a way, this was inevitable. In a top-down context, institutional actors demand workers who fit neatly in predefined roles such as installation artist, computer engineer, web designer, mathematician, 3D animator, and art critic. However, personal interests are never so clear-cut and when freed from some material limitations, creators will often cross boundaries and venture into interdisciplinary practice. It seems that, in our experience at least, once knowledge and

technology have reached a threshold of accessibility, cross-boundary creation tends to emerge naturally.

Neo Co-Creation

Neo is a village, now part of the larger Motosu municipality, located in the mountains, approximately forty kilometers north of IAMAS. Like many other areas in Japan, it is deeply affected by low birthrates and population exodus. The economy is largely dependent on farming and forestry, although a large number of tourists come to see its famous cherry tree, the Usuzumi Zakura.

The Neo Co-Creation project (Kanayama et al., 2016) started in 2015, under the direction of Professor Tomoko Kanayama, when IAMAS was contacted about making use of the abandoned Nagamine Elementary School, which had closed its doors in 1995. Eventually, another location, closer to the train station, was transformed into a space called Neocoza. The original concept was to bring artists and creators to meet and collaborate with the residents of Neo. Due to its very particular environment, many specific cultural practices, from Noh theater⁴ to water management, had arisen in Neo. The project's aim gradually shifted from collaborative creation to the archiving and preservation of the local culture. While the project ended in 2019, a new project named Community Resilience Research continues the relationship between Neo and IAMAS.

The Neo Co-Creation project highlights the shift away from a strongly technological vision of media art to one with a much greater emphasis on communities and issues. Fifteen years before, the Hon'ami Kōetsu project challenged the European conception of how we experience art. Neo Co-Creation, in contrast, challenged the notion of what constitutes a medium. In Neo, shrines and Noh theater, by their sociocultural functions, are in fact media.

The very local specificity of these media highlights the fact that the elements of a global vision are local issues. In a system based on large national or transnational institutions, there is a risk that these local specificities might not receive the attention they deserve. When IAMAS was founded, there was a hope that the web designers and computer graphics artists it

⁴Every year, in April, Noh and *kyōgen* (traditional comic theater) performances are held at the Nōgōhakusan Shrine in Neo. The plays are transmitted orally in Neo families, in a tradition that is believed to be centuries old.

would train would help revitalize the local economy. This vision completely ignored any local context, either historical or cultural, to propose—impose, even—a model inspired by the economies of Hollywood and Silicon Valley, or the art scenes of Linz and Paris. The Neo Co-Creation project shows that with a shift away from rigid top-down structures, it becomes easier to find local solutions to local problems, but in a way that is connected to and enriches global discourse.

CONCLUSION

Founded as one of Japan's first schools offering media arts education, IAMAS's various transformations over the years have reflected the changing demands of such institutions. In its early years, there was a need to provide access to specialized technology and knowledge. This function is not entirely antiquated: fields such as bio art still sometimes require technology that is hard to come by. However, while research in bio art does take place at IAMAS, the focus is now more on ideas than technology. This is in part due to financial constraints, but ultimately it mirrors a long-term global shift in media art from *things* to *ideas*.

We believe that one of the purposes of media art institutions, and IAMAS in particular, is the creation and support of human networks. Despite its small size, IAMAS has fostered a significant network of collaborators over the years. Alumni play an important role in extending the influence of IAMAS well beyond Gifu Prefecture. A great number of alumni now teach in various universities across Japan, so many, in fact, that it is fair to say that one of IAMAS's greatest contributions is the formation of an entire generation of media arts educators in higher education. Also worthy of mention is the fact that despite the rarity of venture projects in Japan, several alumni founded new companies after graduation, some of which, like Rhizomatiks or Semitransparent Design, play an important role in media arts and design in Japan and abroad. IAMAS alumni also play important roles in other major media arts institutions like the Yamaguchi Center for Arts and Media (YCAM), the Sendai Mediatheque, or the NTT InterCommunication Center.

When IAMAS opened its doors, media arts, and even digital art in general, still had limited reach. However, immersive and interactive art, computer animation, network art, and other media art manifestations are now commonplace. Despite the almost unfettered access to tools and learning material, there is still a profound need for emerging media creators to

gather in schools such as IAMAS for the purpose of practice—not in the sense of acquiring technical skills but in the sense of engaging in what teachers at IAMAS call “procedural knowledge,” which is knowledge gained and constantly evolving through active practice, fundamentally attuned to changing contexts. Procedural knowledge stands in opposition to declarative knowledge, which is unchanging and authoritative. In other words, media arts education, at IAMAS at least, has evolved from a dialogue between art and science, a bridging of rigid categories supported by institutions, to an approach where practice and knowledge, creation and inquiry, are now indissociable.

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WAYFINDERS: GUIDES TO PRACTICE

For Chapter 2

Summary of Chapter Themes

This chapter explores the use of media arts in the Anti-Extradition Law Amendment Bill movement, which exemplifies innovative practices of media arts for political means. These include, but are not limited to, the co-creation of media artifacts by activists in the online community, gamification, art invasion of public spaces, use of instant messaging platforms and an interactive map for tactics and strategies at protest sites, fake news and disinformation campaigns, and documentation and archiving of media artifacts. These practices facilitated spontaneous, decentralized organization and the dissemination of information anonymously, which is necessary in the face of current privacy and surveillance threats in the digital era. They also helped transform and extend social movements to the virtual realm for political actions and reach international audiences to build public awareness.

Essential Questions to Catalyze Practice

- What competencies and knowledge could be developed in the use of media arts in political advocacy?
- What are the affordances of media arts that could be applicable in the educational context?
- How could the formal curriculum incorporate informal practices of media arts in different educational levels?

Key Works or Resources to Catalyze Inquiry

Choi, K. C. (2020). *Mention la* (Version 2.1.5) [Mobile app]. App Store. <https://apps.apple.com/us/app/mention/id1488286618>

Siu, E., & Kwong, J. (2020). *Be Water by Hong Kongers* [Exhibition]. <https://www.bewater.digital/>

For Chapter 3

Summary of Chapter Themes

In this chapter, we explored how media arts opened to wider audiences in Chile as a result of the Social Uprising. Such opening took place in the form of broader access, simpler formal choices, the inclusion of multiple voices and discourses, and the explicit support to the causes of the mobilized people. Also, it allowed media artists to impact the mobilization process by helping to push forward the agenda being stressed in the streets, and highlighting crucial issues such as inequality and state violence. Learning from these changes, art educators may provide their students with rich spaces for reflection by including discussions about the potential of media arts and their role in transformative movements.

Essential Questions to Catalyze Practice

- What kinds of discourses are raised by the media arts interventions in the physical and online public venues surrounding your learning community?
- How do these discourses connect to both broader sociopolitical issues and the specific communities where the media arts interventions are located?
- How do the location and formal characteristics of each media arts piece connect to its political intentions and the discourses it highlights?

Key Works or Resources to Catalyze Inquiry

Mapping Public Art Interventions

- Antes del Olvido project. Collective map of 3D models depicting public art interventions during the Social Uprising in Chile: <http://www.antesdelolvido.cl/>
- Mural Arts Philadelphia. *Power Map: Historic Mural Activations*, a map of murals in Philadelphia: <https://www.publicartarchive.org/power-map/>

Video Works

- Videos from the animation workshop by the Ojo Chile collective, organized by filmmaker Niles Atallah: <http://diluvio.cl/projects/ojo-chile-animation-workshop/>

Light-based Works

- Arevalo, C. (2021). Delight Lab: Light as political expression. *Objective*, 5. <https://adht.parsons.edu/historyofdesign/objectives/delight-lab/>
- Segal, C. (2017, September 17). *Projection artists bring light to social issues with attention-grabbing protests*. PBS. <https://www.pbs.org/newshour/arts/projection-light-artists-protest>
- Di Liscia, V. (2020, April 17). *Projections light up cities worldwide urging community care and social distancing*. Hyperallergic. <https://hyperallergic.com/556241/proyectorazos/>

For Chapter 4

Summary of Chapter Themes

This chapter provides an approach to teaching about intersectionality in art forms, by demonstrating the reverberation of rap and hip-hop as protest culture across India through its digitalization, despite barriers of physical and cultural distances between artists and audiences. It offers specific examples of poetics as creative forms of protest and resistance in South Asia, to provide a background to their development as acts of mediation, intervention, and agency in social life, through ICTs. These examples are contextualized within art education as demonstrative of inclusive aesthetic systems and as transnational poetics of resistance and solidarity across borders.

Essential Questions to Catalyze Practice

- What traditional and contemporary forms can we identify/understand, by studying adaptations of artworks produced in protest culture?
- What parallels can we find between this narrative of arts-based protest culture in South Asia and our own multicultural histories?

- How do these examples of transcultural and multicultural making help explore the forms and possibilities of intermedia art (as distinct from multimedia art)?
- How can we make connections, or find intersections, between and across different cultures' forms and styles of artmaking by tracing algorithmic suggestions on ICTs like YouTube?

Key Works or Resources to Catalyze Inquiry

Protest Culture & the Arts

- Gandhi, L. (2020, June 13). *South Asian American activism must go beyond viral stories, advocates say*. NBC News. <https://www.nbcnews.com/news/asian-america/south-asian-american-activism-must-go-beyond-viral-stories-advocates-n1230596>
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- Reed, T. V. (2019). *The art of protest: Culture and activism from the civil rights movement to the present* (2nd ed.). University of Minnesota Press.

Indian Aesthetics

- Goswami, H. D. (2018, April 4). Assignment: Dhvani theory. *Hema D. Goswami*. <https://hemagoswami.blogspot.com/2018/04/assignment-dhvani-theory.html>

Media Prompts

- Articles on South Asian anti-caste hip-hop from the Open Horizons website: <https://www.openhorizons.org/south-asian-anti-caste-hip-hop.html>

For Chapter 5

This chapter describes how the platforms of the big five tech firms Facebook, Amazon, Apple, Microsoft, and Google (FAAMG) have made de-democratization central to their global media pursuits by allowing their platforms to gather massive amounts of user data, and become sites for psychological and political manipulation, and limiting user's agency through FAAMG's antitrust business practices. By analyzing examples of

artists who are cognizant, critical, and subversive with these technologies, frameworks for resisting FAAMG begin to take shape and conceptualize art classrooms as spaces of resistance to global media control.

Essential Questions to Catalyze Practice

- How can art educators and students resist the ways global digital media companies control user data and allow their platforms to be sites for psychological and political manipulation, and perpetrate mass surveillance activities?
- How can art educators engage with these ubiquitous global media platforms in critical, cognizant, and possibly subversive ways?

Key Works or Resources to Catalyze Inquiry

Media Manipulation

- Scott Galloway—How Amazon, Apple, Facebook, and Google manipulate our emotions: https://www.ted.com/talks/scott_galloway_how_amazon_apple_facebook_and_google_manipulate_our_emotions
- Zeynep Tufekci—We are building a dystopia just to make people click on ads: https://www.ted.com/talks/zeynep_tufekci_we_re_building_a_dystopia_just_to_make_people_click_on_ads
- 2020 Global Inventory of Organized Social Media Manipulation: https://demtech.oii.ox.ac.uk/wp-content/uploads/sites/127/2021/03/Case-Studies_FINAL.pdf
- *The social dilemma* [Documentary]. Netflix. <https://thoughtmaybe.com/the-social-dilemma/>

Media Surveillance

- Here's What the Big Tech Companies Know About You <https://www.visualcapitalist.com/heres-what-the-big-tech-companies-know-about-you/>

Global Media Resistance

- Ubermorgen: <https://www.ubermorgen.com/UM/index.html>
- Paolo Cirio: <https://paolocirio.net/work/>

For Chapter 6

Summary of Chapter Themes

This chapter explores shifts in global human interaction through the rapid adoption of videoconferencing in education during the pandemic of 2020, opening new and sometimes troubling possibilities. Using an actor-network theory methodology to assemble a social ontology of the videoconferencing platform Zoom, this asks how we understand contributions to media arts learning that these platforms provide. Zoom is perceived as performing pedagogical acts that introduce stressors to the body (Zoom fatigue), create aesthetic events that may lead to terror, and repeat larger trends in algorithmic bias.

Essential Questions to Catalyze Practice

- How might we think of curriculum as a totalizing architecture of the learning space that involves an assemblage of learners, teachers, things, and content when we forefront our role within an assemblage of designers in this process? How does this conception impact our actions in curriculum making?
- How might we learn from the massive and global adoption of videoconferencing that was a result of the pandemic in 2020 about the assemblage of agencies that constitute instructional design? What ethical considerations in software and learning does it require of us as media art educators?

Key Works or Resources to Catalyze Inquiry

Zoom Fatigue

- Tucker, S., Layson-Wolf, C., Coop, A., Lebovitz, L., & Anagnostou, G. (2021). Combating “Zoom-fatigue”: A comprehensive approach to academic program adaptation and supporting digital wellness during COVID-19. In T. Bastiaens (Ed.), *Proceedings of EdMedia + Innovate Learning* (pp. 727–731). Association for the Advancement of Computing in Education (AACE).
- Toney, S., Light, J., & Urbaczewski, A. (2021). Fighting Zoom fatigue: Keeping the Zoombies at bay. *Communications of the Association for Information Systems*, 48. <https://doi.org/10.17705/1CAIS.04806>
- Consult resources from the Digital Wellness Institute: <https://www.digitalwellnessinstitute.com/about-us>

Aesthetic Events and Safety in Zoom

- Stay up-to-date on Zoom vulnerabilities and security issues via the provider website: <https://explore.zoom.us/en/trust/security/>
- Explore the creative and cinematic possibilities of Zoom: Hawgood, A. (2020, June 18). How to use Zoom like a theater or film professional. *New York Times*. <https://www.nytimes.com/2020/05/27/t-magazine/zoom-tips-coronavirus.html>

Algorithmic Bias

- Consult the resources of the Brookings Institute at its Artificial Intelligence and Emerging Technology Initiative: <https://www.brookings.edu/project/artificial-intelligence-and-emerging-technology-initiative/>
- Look for project examples and resources at the Algorithm Justice League: <https://www.ajl.org/>

For Chapter 7

Summary of Chapter Themes

In this chapter, I have presented concepts related to postdigital artmaking theories and practices. The postdigital can be understood as it relates to theories of dysfunctionality concerning technological functioning and educational application. Through dysfunction, the dynamics of manufacturer intent and user modification can be better understood.

Postdigital works of art originated in the field of electronic music. In this field, digital processes were critiqued for their attempt to present sound in a perfect manner. Postdigital approaches to electronic music attempted to push sound beyond the point of perfection, so that the result was error and noise. They also pointed toward a nostalgia for a predigital era, represented by analog audio sources such as vinyl records.

This duality can be applied to postdigital works of art. The first aspect, where the digital is pushed beyond its capability to present sound in a “perfect” manner, relates to glitch art. The second aspect, where a reactionary response introduces a nostalgia for previous technologies, can be seen in post-internet works of art. Both can be addressed by art educators who hope to address the contemporary promises as well as the challenges associated with digital art in the twenty-first century.

Essential Questions to Catalyze Practice

- If postdigital art both frustrates the emphasis on perfection in digital media, and also represents a return to earlier techniques and themes, then might art educators be able to leverage these points of contrast to open up space for relevant conversations to be had?
- Often, when digital technologies are used in the visual arts classroom, they are presented as a medium that is ubiquitous in fields such as graphic design, product design, and marketing. It is this ubiquity that provides a rationale for the creation of digital illustrations, for example. But what of illustrations that critique the smooth surfaces of Adobe Photoshop and Illustrator? What about digital images that undermine their digital-ness?
- Most of the digital technologies that are used in the spaces of public schooling tend to require skillsets that younger learners might not have developed. These skillsets might be physical, in the case of fine motor skills or hand-eye coordination. They might also be cognitive, in the case of the higher-order thinking skills required in most coding applications. What would be the result if art educators were to teach programs such as ScratchJr, where very young learners learn in coding activities and rudimentary programming exercises?

Key Works or Resources to Catalyze Inquiry

- Cory Arcangel, *Super Mario Clouds* (2002)
- Rosa Menkman, *Beyond Resolution* (2020)
- Jennifer Chan, *Ally (Nice White Person)* (2018)
- Legacy Russell, *Glitch Feminism* (2020)

For Chapter 8

Summary of Chapter Themes

Art educators are struggling to keep up with a rapidly changing and ever-expanding field. This chapter explores the impact of the tech revolution on education and the many reasons that art educators may show resistance to incorporating emerging technologies in their curriculum and provides ideas for overcoming it. Using the early days of video blogging as a model, this chapter suggests an inclusive teaching approach that emphasizes four themes: community, do-it-yourself learning, playfulness, and creative resource sharing.

Essential Questions to Catalyze Practice

- Think of a time when you became fluent in a new technology. What motivated you to do that? What resources helped you?
- How can art educators incorporate new and emerging technologies into their curricula in a way that leaves space for both open-mindedness and critical engagement?

Key Works or Resources to Catalyze Inquiry

Community and Collaboration

- Henry Jenkins on Participatory Culture: <https://www.youtube.com/watch?v=lGpm-clwRsQ>
- Howard Rheingold—The new power of collaboration: https://www.ted.com/talks/howard_rheingold_the_new_power_of_collaboration?language=en

Do-It-Yourself Learning

- Sylvia’s Superawesome Maker Show: <https://sylviaishow.com/episodes/>
- Ellen Jorgensen—Biohacking—you can do it, too: https://www.ted.com/talks/ellen_jorgensen_biohacking_you_can_do_it_too?referrer=playlist-biohacking_diy_science_for_everyone

Playfulness

- Ideation Cards: <https://www.teknio.com/products/iot-ideation-cards-v1>
- Leah Buechley—How to “sketch” with electronics: https://www.ted.com/talks/leah_buechley_how_to_sketch_with_electronics

Creative Resource Sharing

- Neil Gershenfeld—Unleash your creativity in a Fab Lab: https://www.ted.com/talks/neil_gershenfeld_unleash_your_creativity_in_a_fab_lab
- Robin Hooker—A makerspace for everyone: https://www.ted.com/talks/robin_hooker_a_makerspace_for_everyone

For Chapter 9

Summary of Chapter Themes

This chapter draws from the European Digital Competence Framework and presents examples of local and international art education projects conducted by Portuguese and Spanish researchers who are using digital environments to promote intercultural education and civic engagement.

Essential Questions to Catalyze Practice

- How can art educators develop critical analysis of multimedia information available in digital supports (e.g., social channels, webpages)?
- How can we explore critically and creatively new media; multimedia; digital media; sound; and images?
- How can we use online platforms to generate and communicate ideas and feelings about cultural narratives and societal and environmental challenges?

Key Works or Resources to Catalyze Inquiry

- The rights of children and young people on digital platforms. Stakeholder guide: https://www.imy.se/globalassets/dokument/rappporter/the-rights-of-children-and-young-people-on-digital-platforms_accessible.pdf
- Mediamocracy: <https://mediamocracy.org/>
- Online activism, social media, and young people: <https://www.internetmatters.org/hub/news-blogs/online-activism-social-media-and-young-people/>
- Stimulating reflection about selfies to develop a critical and efficient pedagogical experience: <https://narcissusmeetspandora.eu/>

For Chapter 10

Summary of Chapter Themes

This chapter describes how typical media arts education activities that connect tactile sensation and visual images through interactive manipulation will raise the sense of reality in the context of visual images. I have defined this phenomenon as visually triggered ideated somatic knowledge (V-TISK). I used near-infrared spectroscopy (NIRS) to clarify how V-TISK works as a brain perception process. The experimental result confirms that the experience of image operation tends to ideate significant activation of the tactile sensation for their visual input. Also, the experiment suggests there are different levels of tactile perception among individual students, and it could be cultivated through art education, or media art educators might better grasp

the perception types of each student. This discovery could be a vital reason for teaching media arts education in general education.

Essential Questions to Catalyze Practice

- How can art educators enhance the student's reality of the social context and pay deep attention to it through image media?
- How can art educators recognize students who have aphantasia?

Key Works or Resources to Catalyze Inquiry

Visual Culture Education

- Sahara, O. (2020). A look at manga in Japanese public education. In M. Toku & H. Tsuchiya Dollase (Eds.), *MANGA!: Visual pop-culture in ARTS education* (pp. 22–33). InSEA Publications. https://insea.org/wp-content/uploads/2021/08/MANGA-VPC-in-ARTS-Education-Toku_Dollase-2020.pdf
- Tamara Alireza, Aphantasia: Seeing the world without a mind's eye, TEDxGoodenoughCollege, <https://youtu.be/arc1fdoMi2Y>

For Chapter 11

Summary of Chapter Themes

This chapter looks at how artists comprehend and use artificial intelligence (AI) in their work. By looking first at general comprehensions and different interpretations of AI, this chapter then offers different angles into AI art by looking at the work of several artists. With the help of artists work, AI art is then positioned into a broader context, offering significant views on AI, how it behaves, and what it means for future global media art. Moreover, this chapter positions AI art in the art educational context, offering different ways AI could be used in art education and why art education is crucial in comprehending AI.

Essential Questions to Catalyze Practice

- What is AI and how is it developed? Moreover, by whom and under which contexts is AI developed and why?
- In which ways does AI affect art? Can AI be used in artmaking and, if yes, under which circumstances?
- How should artists and art educators handle and treat these new technologies that are complexly intertwined with other processes, possess some sort of agency, and also offer a new material, medium, and experience?

Key Works or Resources to Catalyze Inquiry

General Comprehension of AI

- Joanna Bryson: Two ways AI technology is like Nuclear technology: <https://joanna-bryson.blogspot.com/2021/04/two-ways-ai-technology-is-like-nuclear.html>
- Beth Jochim: Designing AI: The Feminist Way: <https://www.libraei.com/designing-ai-the-feminist-way/>
- David M. Berry: AI is turning us into machines: https://iai.tv/articles/ai-is-turning-us-into-machines-auid-2044?_auid=2020
- Jeannette Winterson: Frankisstein: <https://en.wikipedia.org/wiki/Frankisstein>

Media Art and AI

- Alex Estorick and Luba Elliot: Artificial Abstraction and the Poetics of Machine Learning: <https://flash%2D%2D-art.com/2020/03/artificial-abstraction-and-the-poetics-of-machine-learning-the-role-of-ai-in-the-art-of-anna-ridler-and-roman-lipski/>
- Mario Klingemann: Appropriate response: <https://onkaos.com/mario-klingemann/>
- Holly Herndon & Mat Dryhurst: Interdependence podcast: <https://interdependence.fm>

Art Education and AI

- Carrie Sijia Wang: An interview with Alex: <https://carriesijiawang.com/interview/>
- Jevin West and Carl Bergstrom: Which Face Is Real

For Chapter 12

Summary of Chapter Themes

This chapter describes current policy commitments promoting ethical uses of AI in education. We focus on two AI artists, Sarah Newman and Stephanie Dinkins, whose work investigates ethically sound relationships with AI. We consider a posthuman perspective as key for the next generation to knowledgeably support and enact more inclusive, responsible, and ethical uses of AI. Art education can expand from an instrumentalized, anthropocentric approach to digital art creation to include ethical

considerations of AI-human relations and distributed networks of human-nonhuman assemblages. Mobilizing such theoretical expansions in the classroom, while complex, is vital to developing an informed generation to engage thoughtfully and critically with the dramatic technological intensifications of their world.

Essential Questions to Catalyze Practice

- How can art educators incorporate AI into the curriculum to enhance awareness of ethical concerns convened by human-AI relations?
- How can art educators enhance creativity within digital art practices to avoid a limited instrumentalization of these applications?
- How can art educators meld AI programming with more physical art materials?
- How does AI programming in the classroom influence the teacher's role and relationship with their students?
- How can greater creative and ethical links be generated between the in-school and out-of-school worlds of students, given that they spend many hours of their lives online?

Key Works or Resources to Catalyze Inquiry

Image Generation Applications

- GPT-3 text-generator: <https://openai.com/blog/openai-api/>
- Text2Art: <https://text2art.com/>
- Artbreeder: <https://www.artbreeder.com/>
- Go Art: <http://goart.fotor.com/>

AI Artists

- AIArtist.org (this link includes many AI artists): <https://aiartists.org/>
- Memo Akten: <https://www.memo.tv/works/>
- Algorithmic Justice League: <https://www.ajl.org/>
- Stephanie Dinkins: <https://www.stephaniedinkins.com/>
- Sarah Newman: <https://sarahnewman.com/>

For Chapter 13

Summary of Chapter Themes

This chapter provides a lesson example for art teacher educators to guide preservice art teachers to learn about consumer media and the

significant role of media arts in social and consumer change, which can also inform art educators about the development of youth identities, especially identities and sometimes stereotypes toward certain groups of people such as LGBTQ+. Our analysis reveals three strategies that our students used to design their cartoon characters after analyzing media. We also provide suggestions for how teachers can be allies of the LGBTQ+ community.

Essential Questions to Catalyze Practice

- What are queer-coding and queer-baiting? And how have they been used in media arts such as animation films?
- How can we critically examine and decode misrepresentations of the LGBTQ+ people in media arts, such as animation films and media?
- How can we incorporate LGBTQ+ issues into K-12 art classrooms through character design?

Key Works or Resources to Catalyze Inquiry

- Learning for Justice: <https://www.learningforjustice.org/>
- Teaching for Social Justice Standards, downloadable PDF: <https://www.learningforjustice.org/sites/default/files/2020-09/TT-Social-Justice-Standards-Anti-bias-framework-2020.pdf>
- LGBTQ+ Interest Group at the National Art Education Association: <https://www.nacalgbtq.com/>
- The United Nations Educational, Scientific and Cultural Organization (UNESCO). (2017). *Education for sustainable development goals: Learning objectives*. <https://unesdoc.unesco.org/ark:/48223/pf0000247444>

For Chapter 14

Summary of Chapter Themes

This is an art education initiative developed with preservice teachers of primary education, where contemporary artists center the cultural and social voices reflected in our society. One of the main goals was to understand how the educational approach of cultural diversity could be implemented through an art education initiative, where art contents are aligned with the art education curriculum, enhancing the vision of art as social change. In this respect, multicultural education provides the appropriate framework to design an initiative that effectively shows the possibilities of

artistic practice as a way of exploring cultural identities. The project started by looking at contemporary artworks that advocate for the diversity of cultural identities and identifying the social issues the artists were dealing with. The students then chose cultural diversity themes of interest to create a visual story through stop-motion animation. Finally, a reflecting dialogue was conducted to exchange ideas about the cultural diversity issues dealt with in their stop-motion animations and the challenges faced during the artistic process. The reflective dialogue enabled the students to relate animations that deal with the same themes on gender, disability, racial, and ethnic diversity. Moreover, the project empowered them as teachers with the ability to create art educational initiatives that advocate for the diversity of cultural identities.

Essential Questions to Catalyze Practice

- How do art educators approach the artistic canon to reflect the cultural diversity of today's society?
- Considering a dialogue as a reflective practice in art education, how could we evaluate the dialogue for the acquisition of competences?
- As art educators, what other approaches to cultural diversity could be explored beyond gender, race/ethnicity, and disability?

Key Works or Resources to Catalyze Inquiry

Cultural Diversity from Gender in Art

- Lula Gómez: *Eres una caca* (You are a shit), YouTube channel with all the animation movies. <https://www.youtube.com/c/LulaGomezFem/featured>

Cultural Diversity from Disability in Art

- Judith Scott: *¿Qué tienes debajo del sombrero?* (What's under your hat?), a documentary about the life and work of Judith Scott. <https://vimeo.com/10750240>
- Janela del Alma: *Window of the Soul*, a documentary about the experience of seeing and not seeing in a saturated world of images by people with different visual impairments and blindness. One of the stories is about the blind Franco-Slovenian photographer Evgen Bavcar. https://youtu.be/_I9I7upG0DI

Cultural Diversity from Race/Ethnicity in Art

- Angelina Daas’s Humanae project, which deals with the beauty of human differences in skin color. https://www.ted.com/talks/angelica_dass_the_beauty_of_human_skin_in_every_color
- Kehinde Wiley’s New Republic project, which uses portraiture to work on issues such as race and gender: https://www.brooklynmuseum.org/exhibitions/kehinde_wiley_new_republic/

For Chapter 15

Summary of Chapter Themes

This chapter teaches how K-12 students with visual impairments attending a state school for the blind have collaborated with preservice art education majors to create and exhibit stop-motion animations that teach about the United Nations Educational, Scientific and Cultural Organization’s (UNESCO’s) annual themes. Using qualitative interviews, it describes how the participants have used media arts, assistive technologies, artificial intelligence, multisensory resources, and choice-based learning tasks to teach the K-12 students and facilitate the professional development of preservice teachers. Practical implications for education include making accessible technologies accessible, the importance of teacher professional developments, and strategies that foster student independence and leadership.

Essential Questions to Catalyze Practice

- What is accessibility? What roles do assistive technologies play in fostering students’ abilities and encouraging all students to participate equally in creative learning tasks?
- Why is it important for students to have curricular choices? How can educators teach choice-based learning tasks that combine media arts and fine arts to teach about global topics?
- How do professional developments benefit teachers and the students they teach? Why are ongoing professional developments necessary when teaching media arts and using assistive technologies? In addition to professional developments, what other resources can educators access to learn about media arts and assistive technologies to meet the needs of diversified learners, including students with visual impairments?

Key Works or Resources to Catalyze Inquiry

- Experience the students' stop-motion animations: https://www.youtube.com/playlist?list=PL7_CEnmSpXkbsS0POA44uAIKP3OIcaYhq
- Explore the International Children's Exhibition of Fine Arts Lidice's (ICEFA Lidice's) online collection of children's artworks inspired by UNESCO themes: <https://www.mdvv-lidice.cz/en/>
- Access instructional resources and slide presentations for designing a choice-based curriculum to teach diversified learners using media arts and fine arts: <https://routledgetextbooks.com/textbooks/9781138549326/>
- Learn more about Seeing AI: <https://www.microsoft.com/en-us/ai/seeing-ai>
- Download UNESCO's *Artificial intelligence in education: Challenges and opportunities for sustainable development*: <https://unesdoc.unesco.org/ark:/48223/pf0000366994?posInSet=9&queryId=4a437600-5100-4206-a5e7-0c552668d1d1>

For Chapter 16

Summary of Chapter Themes

There are three major themes in the chapter: (a) arts-based transcultural dialogue, (b) Exquisite Engendering based on remix theory and the surrealists' Exquisite Corpse, and (c) Sensory Immersion in Narratives of Places: (re)Creating Histories. We reveal these themes through a conversation in which we reflect on what motivates us to bring our students together each year for more than a decade in transcultural dialogues to collaborate in creating media arts.

Essential Questions to Catalyze Practice

- What are the overarching goals of the project and how can the facilitators plan and allow for flexibility, particularly in terms of scheduling but also to engage students in the planning, so it is an emergent curriculum?
- Does the curricular framework enable students to ask questions of each group from their cultural perspectives so that the interactions enrich the criticality of the curriculum?
- How does the dialogue generate art, and how do the shared encounters with the art serve as catalysts for critical reflection about oneself in relation to others?

Key Works or Resources to Catalyze Inquiry

The following are links to *Transcultural Dialogues* exhibitions and the pedagogical process leading to the exhibitions.

- *Exquisite Engendering Remix* exhibition (2014): <http://cyberhouse.arted.psu.edu/322/exhibition2014.html>
- *Exquisite Engendering Remix* pedagogy (2014):
<http://cyberhouse.arted.psu.edu/322/projects/ExquisiteEngenderingF2014.html>
- *Exquisite Engendering Remix* exhibition (spring, 2015): <http://cyberhouse.arted.psu.edu/322/exhibition2015F.html>
- *Exquisite Engendering Remix* pedagogy (spring, 2015):
<http://cyberhouse.arted.psu.edu/322/projects/ExquisiteEngenderingSp2015.html>
- *Exquisite Engendering Remix* exhibition (fall, 2015): <http://cyberhouse.arted.psu.edu/322/exhibition2015F.html>
- *Exquisite Engendering 360-degree Remix Games* exhibition (2017):
<http://cyberhouse.arted.psu.edu/322/exhibition2017F.html>
- *Exquisite Engendering 360-degree Remix Games* pedagogy (2017):
http://cyberhouse.arted.psu.edu/322/projects/4_ExquisiteEngendering.html
- *Overlap: Full Circle* exhibition (2018): <http://cyberhouse.arted.psu.edu/322/exhibition2018.html>
- *Overlap: Full Circle* pedagogy (2018): http://cyberhouse.arted.psu.edu/322/projects/1_circle.html
- *Sensory Immersion in Narratives of Place: (re)Creating Histories* exhibition (2019): <http://cyberhouse.arted.psu.edu/322/exhibition.html>
- *Transcultural Visual Dialogues: Body, Identity, and Exquisite Engendering Remix* exhibition (2021): <https://sites.psu.edu/uganda2021/>

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