



Reimagining Education Systems: How Research on Digital Learning Can Inform Pedagogical Practice

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Abstract. The COVID-19 pandemic showed how vulnerable contemporary education systems are to change and disruption to their operational models. The fact that entire education systems globally had to shut down their learning and teaching operations during the pandemic, or move on to a minimalist form of it, requires a critical re-examination of our core business models. Educational provision globally has been under stress long before COVID-19 struck. While the demand for education and re-education grows exponentially, resources and opportunities for the provision of these opportunities are under strain globally. Preliminary assessments of the readiness and resilience of existing models, reports that contemporary education systems are unfit and unsuited to lead learning for tomorrow, and that a re-imagination and re-engineering of institutional choreographies is required. Such a rethink and re-imagination requires greater levels of openness and flexibility in its modus operandi in order to be more resilient to change and disruption. This will involve a rethink and re-imagination of everything from how students access learning opportunities, to how they are taught, assessed and supported by teachers and educational institutions, and importantly, how technology can be used to inform and support pedagogical practices.

1 Introduction

Few would have imagined that the COVID-19 pandemic could cause so much grief and havoc to our operating systems. We hadn't seen anything like it since the 1918–20 Spanish flu epidemic. Although there have been several smaller and more regional outbreaks since then, these have never had the impact of the COVID-19 pandemic. In the case of education, the impacts of the COVID-19 pandemic have been indiscriminate. From resource rich Ivy League institutions to the rest, all education systems had been gravely impacted, forcing them to shut down their operations, and resort to a minimalist form of it to remain viable (JISC 2021). The pandemic revealed how unprepared and ill-equipped the education sector globally, has been for the disruption of its educational operations and core business models.

It is imperative therefore, that we ask how it has been possible for our educational operations to be compromised so completely? Why so many of our education systems universally have had to shut down their learning and teaching activities, or resort to a minimalist form of operation? What does this say about how we have been preparing

our learners and teachers for the contemporary educational space? How prepared are educational institutions for a digitally enhanced and future-focussed education system? But more importantly, how are contemporary universities defining their places in a diverse and competitive environment, and rethinking and redesigning their institutional choreographies to meet the challenges posed by disruptive forces such as COVID-19? (Ernest & Young 2018).

2 Can Contemporary Models Lead Learning for Tomorrow?

A 2020 study of the Australian education system carried out by CISCO (<https://bit.ly/3uTW3kl>; <https://bit.ly/3Bp10UP>), asked how are Australian education institutions reimagining their core functions? The goal of this study was to understand how universities, and TAFEs (Technical and Further Education Institutions) in the Australian education context are reimagining their core functions—namely, teaching, research, administration, and campus design, in the wake of the COVID-19 pandemic. Seventy-eight percent of Australian Universities and five out of seven TAFEs responded to this survey. The survey revealed that COVID-19 pandemic served as a tipping point for open, flexible, online and distance learning (OFDL) causing campus-based operations to reconsider their business models. After decades of existing on the margins of mainstream processes, open, flexible and distance learning (OFDL) was suddenly being seen as the only viable, and possibly the most resilient form of education available (Dede & Lidwell, 2023).

The CISCO study also revealed that it is not just the physical campus spaces that are changing, but that all university functions are being reimagined in the wake of the pandemic. These include all teaching and learning functions, the student learning experience, research and industry engagement, as well as administration. The overall message of this study has been that COVID-19 will change education, and that the design of the physical campus will never be the same again.

So then, what would that rethink and recalibration of educational as well as institutional choreographies for a future focussed education look like? To allow for greatest resilience in institutional operations, such a reimagination will have to feature ideas around *openness* and *flexibility*. Openness and flexibility are value principles. As such they are unlike modes of learning such as *distance*, *blended*, *hybrid* or *face-to-face learning*. Openness and flexibility exist in all modes of learning in different degrees.

The idea of open is deeply grounded in a socio-political agenda which seeks education for all as the path to real freedom and justice (see Table 1). It comprises the practice of *open access*, *open learning* and *open scholarship*. *Open access* is about inclusive and equal access to educational opportunities without barriers such as pre-requisite entry qualifications or ability to pay. The idea of open access is based on the premise that all lives have equal value, and as such everyone has the right to education—not just the privileged few who are able to access and afford the physical campus-based experience.

The idea of open is also about *flexibility* in relation to the time, place and pace of one's learning activities. This is about freedom of choice and being able to exercise it without being locked into a mode or pattern that is based on the preferences of the educational institution. And finally, the idea of open comprises the practice of *open scholarship* which is about the adoption of a culture of openness in relation to how content and intellectual property is shared with others for use, adaptation and redistribution, and at no cost. This dimension of open educational practice is based on the premise that education, not unlike food, water, and shelter is a basic need that should be accessible to all for an equitable social structure.

Table 1. Dimensions of Open Educational Practices

Dimensions of Open education	Pedagogical affordances
Open access	This is about inclusive and equitable access to educational opportunities without barriers such as entry qualifications and ability to pay. It is based on the value that all lives have equal value
Open learning	This is about the ability to learn at anytime, anywhere and at any pace. It is based on the principle that learners ought to possess the freedom and the flexibility to choose their mode, medium, time, place and pace of study
Open scholarship	This is about releasing one's intellectual property under an open license scheme that permits no-cost access, use, adaptation and redistribution. It is based on the value that education is a basic need that should be accessible to all, if we were to achieve education for all, freedom, justice and equality

Flexible learning on the other hand, unlike modes of learning, is a state of being in which the acts of learning and teaching are increasingly freed from the limitations of its *time, place and pace*. For learners, flexibility in learning can include choices in relation to their learning activities, assessment tasks and the time, place and pace of their completion. For teachers this kind of flexibility can comprise choices in relation to the time, place and pace of their communication and engagement with learners as well as the educational organization. Flexibility is a desirable value much like how society regards fairness and equality as desirable goals. Flexibility exists in all forms of communication between teachers and learners, although to varying degrees and along several dimensions. These include flexibility in relation to learner's engagement with the subject matter, their teachers, peers, the learning environment, and the educational institution (Table 2). This also includes learners' engagement with their assessment activities, and teachers' feedback on them. It is about how learners might prefer to interact with the content and critical stakeholders in their learning environment.

Table 2. Dimensions of Flexibility

Dimensions of Flexibility	Pedagogical affordances
Learner-content engagement	This is about learners' engagement and interaction with the subject matter in ways that suit individuals, and their approaches to studying and its time, place and pace
Learner-teacher engagement	This is about choices learners have in relation to the mode and method of their engagement and interaction with their teachers and tutors
Learner-learner engagement	This is about choices learners have in relation to the mode and method of their engagement and interaction with their peers in small and large groups, and in offline and online educational settings
Learner engagement with the learning environment	This is about adaptable access, interaction and engagement with the learning environment (such as with mobile devices, Wi-Fi access and innovative use of study space)
Learner engagement with assessment activities	This is about choices learners have in relation to the fulfillment of their assessment requirements
Learner engagement with feedback	This is about choices learners have in relation to access to feedback on their learning and assessment activities
Learner engagement with the institution	This is about choices learners have in relation to their engagement with the services of the educational institution

3 Useful Lines of Inquiry—The Grand Challenge

Openness and *flexibility* in learning and teaching are relevant in any mode of study including campus-based face-to-face educational operations. As such, one size or approach to open and flexible learning does not, and will not fit all learners, teachers or disciplines. There will be a need for different approaches, with different levels of openness, flexibility, structure and guidance for different cohorts and learning contexts, while the threshold value principles of all approaches remain the same (Naidu, 2017).

The idea of openness and flexibility are not synonymous with mode or models of learning and teaching. And therefore, engagement with openness and flexibility does not mean the death of the campus-based experience. These value principles can, and do exist in *distance learning*, *online learning*, *blended learning*, *hybrid learning*, *hyflex learning*, as well as *campus-based learning* contexts. Decisions around the choice of levels of openness and flexibility in these educational contexts will vary according to their orientation and educational philosophy. Those institutions that purport to be *open education* operations, for instance, will have the balance tipped in favour of greater

openness and flexibility, while conventional campus-based educational settings will tip the balance in favour of less openness and flexibility in their operations.

While there are attempts at integrating openness and flexibility in all of the foregoing educational contexts, currently they exist in boutique form, on the side and the peripheries of mainstream practices. Moving these operations, to the center and into mainstream educational processes is the greatest challenge facing institutions. This requires an enterprise-wide rethink of educational and institutional choreographies. And as increasingly wider range of technologies become available with more powerful affordances for integrating openness and flexibility in learning and teaching, a useful line of inquiry ought to be to see how these can support and leverage greater levels of openness and flexibility in education systems.

While the imperative to invest in greater integration of digital technologies might seem obvious for many, how these technologies can be used to leverage openness and flexibility in education systems ought to take center stage. What would education systems that adopt technology to promote openness and flexibility look like? What would be different about them in how their education services are organized and managed? How would role and responsibility in relation to teaching be reorganized? How would academic staff be appointed to positions, and under what terms and conditions? How would academic staff have access to requisite professional development? What kinds of policy frameworks will be required for such future-focused education systems and institutions? Most importantly, what would be different about these considerations from the way they have always been (Peters et al., 2020; UNESCO, 2020)?

4 How Research on Digital Learning Can Inform Pedagogical Practice

Great teaching is about grand designs! This kind of teaching requires careful thought to, not only the subject matter that will need to be taught, but how it will be taught and what tools and technologies will be used by teachers and learners. Great teaching is when students have learned. And this *requires not only an in-depth understanding of the subject matter content, but also the pedagogy, and the technology that will be used to mediate the transaction.* Seen in this manner, teaching is a design activity not unlike the work of engineers, architects, or choreographers (Lee, 2023; Kolodner, 2023).

While great teaching is informed by a knowledge of the learning sciences, it is also an outcome of creativity (Myers, & Adams-Budde, 2016; Robinson, & Aronica, 2015). At the heart of synergies derived from this kind of expertise lies knowledge about technology, the pedagogy and the subject matter. Popularized as *technological pedagogical content knowledge (TPACK)*, this framework has its origins in Shulman's (1986) idea of *pedagogical content knowledge (PCK)*, which is knowledge about learning and cognition. When combined with technological, and subject matter knowledge, these three knowledge domains provide the critical ingredients for the design of productive learning experiences, and great teaching is the about the design of these learning experiences.

Seen in this way, the term *delivery* becomes an inadequate descriptor of what goes into teaching. Teaching is not about “delivering” anything to anyone (Clark, 1994). It is about the *design of productive learning experiences*, which requires getting the “*mixture right*”

between how much of it is going to be one-on-one or group-based, face-to-face, online, at a distance or blended. The one-to-one model of learning—although powerful, is not necessarily the gold standard. As such there can be no generalizable model of teaching (Dron, 2022). From independent study to group-based learning, design is critical to the development of effective, efficient and engaging learning experiences. In the case of a lecture, for instance, along with defining its focus and scope, a teacher needs to research, compile and present the subject matter content, considering issues such as sequence and timing, the audience and the ambience of the venue in order to ensure achievement of the goals of the lecture and ensure maximum impact.

The adoption of new tools and technologies to leverage key teaching and learning functions is an important part of that consideration (Fobes, & Kaufman, 2008). Digital technologies support a wide range of affordances for teaching and learning. As these tools and technologies become more accessible, teachers as well as learners will need to regularly reskill themselves in order to be effective and efficient in the contemporary educational space, where the delivery and mediation of the subject matter knowledge is but a small part of the teaching and learning transaction.

5 Useful Lines of Inquiry—What is Worth Investigating and How?

There is a lot that we already know about human learning. Therefore, putting a finger on what is worth investigating is key (Glassman 2001). This is not only about identifying a worthwhile research question but also making sure that it is a researchable question—which means that the research question is framed in such a way that it can be reliably and validly investigated. When identifying what is worth investigating, it is important to remember that you are joining a conversation, so make sure you have something “unique” to say on the topic. Most submissions for publication consideration are rejected because they make little contribution to the conversation, or issues confronting the field, or they are not contextualized, and as such not aligned with the aims and aspirations of the targeted publication outlet.

Contributions for publication consideration need to be aware of what is known, and not known about a topic, what is worth investigating, and why we need to bother with it? Consequently, the literature review is central to this task (Gredler and Sheields 2004). A good literature review is a lot more than a summary of what has been done or said on a topic. A good literature review synthesizes all that has been done and said in relation to a query or question. It is only when this is achieved, that it is possible to arrive at the research questions which point to what is not known about the topic and which is worth investigation or further research.

Clear research questions are critical to the next step in the process which is the selection of the appropriate research methodology. There are several research methods to choose from, and these vary from pure experimental designs to more ethnographic approaches, and both may comprise the use of quantitative as well as qualitative data gathering tools. A great deal of care is required in matching research questions with appropriate research methodology. Insistence on methodological rigor is crucial in this process (Naidu, 2015a, 2015b). A lack of methodological rigor or a substantial awareness of the existing literature are the most common reasons for the failure of a lot of

submissions (Mishra, Sahoo, & Pandey, 2021). The focus on typical questions is also a common problem facing submissions for publication consideration. These include over-researched questions about the difference between online and campus-based models, whether institutions should specify the mode of learning on the award or certification, the perception in industry and academia of online education, and what needs to be done so they can be treated equally.

At first glance, these lines of questioning look interesting and relevant, but on closer look they are fundamentally flawed. For starters, comparing modes of learning and teaching is not only difficult because iterations of a mode are likely to differ, but also not very useful unless the conditions of learning and teaching that are being compared are exactly the same across educational contexts. If one chooses this as a focus then a more useful line of inquiry might be to look for insights on particular attributes or affordances of learning and teaching. Table 3 provides some insights on how best to approach investigating the affordances of these attributes and particular pedagogical practices.

Table 3. Useful lines of inquiry

Pedagogical practices	Pedagogical affordances
1. Open access	<ul style="list-style-type: none"> • How does access to learning opportunities influence key educational dimensions such as participation and socio-economic development of individuals and societies?
2. Open learning	<ul style="list-style-type: none"> • How does various levels of flexibility in learning and teaching influence key educational dimensions such as participation, persistence and success with learning and teaching?
3. Open scholarship	<ul style="list-style-type: none"> • How does open access to content and products of intellectual outputs and educational resources influence learning and teaching experience design?
4. Learner-content engagement	<ul style="list-style-type: none"> • How can technology be used to support learners' engagement and interaction with the subject matter in ways that suit individuals, and their approaches to studying and their time, place and pace?
5. Learner-teacher engagement	<ul style="list-style-type: none"> • How can technology be used to provide learners with choices in relation to the mode and method of their engagement and interaction with teachers, tutors and other agents?

(continued)

Table 3. (continued)

Pedagogical practices	Pedagogical affordances
6. Learner-learner engagement	<ul style="list-style-type: none"> • How can technology be used to provide learners with choices in relation to the mode and method of their engagement and interaction with their peers in small and large groups, and in offline and online educational settings?
7. Learner engagement with the learning environment	<ul style="list-style-type: none"> • How can technology be used to support adaptable access, interaction and engagement with the learning environment?
8. Learner engagement with assessment activities	<ul style="list-style-type: none"> • How can technology be used to provide learners with choices in relation to the completion of their assessment requirements
9. Learner engagement with feedback	<ul style="list-style-type: none"> • How can technology be used to provide learners with choices in relation to their access to feedback on their learning and assessment activities
10. Learner engagement with the institution	<ul style="list-style-type: none"> • How can technology be used to provide learners with choices in relation to their engagement with the services of the educational institution

6 What Authors Ought to Know About Best Practices in Publishing

There are many things that researchers need to consider and be able to do in order to ensure that their work gets published in the targeted publications (Hartshorne, Ferdig, & Bull, 2021). Many of these considerations have to do with being familiar and conversant with the peer review, and the publications process, and how to negotiate that space. These include following the stipulated guidelines of the targeted publication, its conventions and publication style. Other factors have to do with the contribution of one's research to the wider community and society more generally.

The ultimate goal of research is to make a contribution to knowledge. In order to be able to do so, one needs to possess a very deep and complete understanding of the literature on the topic. It is only when this is achieved that one is able to identify what is not known about a topic, and therefore worth exploring and investigating. These are your research questions and only when this is known and decided upon, that it is possible to select the approach to the investigation (i.e., the research method). Problems with selecting an appropriate research method usually arise when the research question is unclear or poorly articulated. Matching the research question with a research method is crucial to the success of a project. Compromising on methodological rigor is never a good idea, and it should not be negotiable.

The importance of getting these steps right in the conduct of any research cannot be overstated, and not negotiable. These attributes of a research project, unlike its composition, argumentation and adherence to publication style etc., cannot be fixed after the research is conducted just as the foundation stones of a building cannot be replaced once the building is built. As such, the fate of the publication is sealed long before it reaches its reviewers (Naidu, 2021). Getting this right in the conceptualization and the design phases of the research project will very likely assure publication of its outputs.

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