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CHAPTER 1

Critical Is Something Others (Don't) Do: Mapping the Imaginative of Educational Technology

Chris Bigum, Scott Bulfin, and Nicola F. Johnson

Mapping the Imaginative of Educational Technology

This book is an outcome of a provocation paper[1] prepared by Neil Selwyn (2012) for a conference concerned with critical perspectives on learning with new media. In his paper, Selwyn argued that

> Education and technology could be classed as an area of scholarship whose time is yet to come…As an area of academic study, education and technology is populated by a transient ragbag of individuals hailing from the learning sciences, social psychology, computer science, teacher education, media studies, sociology and beyond. As such, this is a "mongrel" area of scholarship that suffers from the absence of any long-term collective obligation amongst its participants to develop their "(non)field" of study into anything more than the sum of its parts. (p. 6)

He made a case that the (non)field of education and technology (used in this instance to refer to computing and related technologies) is largely instrumental in its approach and detailed limitations of topics, questioning theory and method. Selwyn made a strong plea to broaden and sharpen what he

called the "ed-tech imagination," in terms of the limitations he identified. As is the case with any good provocation, space is created to explore and examine the ed-tech imagination of those who write and research in the (non)field. It's fair to say that the provocation worked. This book is one product of it. In what follows we will use the shorthand "ed-tech" to label the field in which computing and related technologies are used for various educational purposes. So, in the spirit of sharpening and broadening the ed-tech imagination, this book is organized around three aims:

- To make an argument about the need for critical perspectives in research on ed-tech more generally and in several specific areas: theory, key concepts, and "getting serious" about how the field develops, integrates, and handles critique of accumulated knowledge and perspectives.
- To illustrate the use of critical perspectives (i.e., it doesn't just make the argument that these are needed) in a range of areas by reexamining key educational ideas and concepts often used in the area of education and technology research and doing this via "critical perspectives" drawn from social, cultural, and critical theory. This is partly about being "more critical" in terms of asking more critical questions about technologies, but also about rethinking the relationship between "technology" and the "educational" or the "social."
- To point forward and identify and evaluate some of the larger questions, tensions, problems, and conflicts that arise when critical perspectives are employed to look at ed-tech, and to imagine how the field can be taken forward.

This book is a modest contribution to what is an ambitious agenda to rethink, rework and reimagine scholarly and research work concerning ed-tech. To gesture to the size and difficulty of the task, we are reminded of the observation made by French philosopher Michel de Certeau, who pointed out that we learn as much about a field of study by looking at what it *excludes* as we do by focusing on what it includes. He wrote: "finally, beyond the question of methods and contents, beyond what it says, the measure of a work is what it keeps silent" (de Certeau, 1986, p. 131). He went on to describe the vast "expanses of silence" which are found within dominant cultural discourses as a "geography of the forgotten" (p. 131). The contributors to this edited collection draw attention to the many elements of the *geography* of ed-tech that are sometimes ignored, often forgotten, or completely disregarded as part of the terrain. Collectively, they remind us that the practices of education necessarily undergo an interrogation whenever these practices

are altered or tinkered with as occurs when new or different ways of doing things are explored. We use the phrase new or different ways of doing things to shift the focus from the *objects* of ed-tech, *the stuff*, the hardware, software, and netware, to the new or different *practices* that emerge when *new stuff* is deployed in an educational setting. Practices, ways of doing things, are necessarily entanglements of people and things (Pickering, 1995). Most of the chapters in this volume describe the multiple practices of various groups of people in a range of contexts, and are somewhat unique as they tend to avoid focusing exclusively on *objects* or *stuff*. For example, the contribution from David Shutkin describes the complex sociotechnical and relational work that both constructs and constitutes a one-to-one laptop initiative across a US school district. Employing actor-network theory, rather than a focus on laptops per se, Shutkin illustrates the complex negotiations that bring the initiative into being and sustain it.

Maps and Map Making

To speak of a geography of ed-tech is to invoke metaphors of mapping and of map making. Mark Monmonier (1991) reminds us of the problems of making any map: "a single map is but one of an indefinitely large number of maps that might be produced for the same situation or from the same data" (p. 2). His argument, that every map must necessarily contain lies, distortions, and omissions, is also one that applies generally to *any* representation[2] of reality. He goes on to say

> A good map tells a multitude of little white lies; it suppresses truth to help the user see what needs to be seen. Reality is three-dimensional, rich in detail, and far too factual to allow a complete yet uncluttered two-dimensional graphic scale model. Indeed, a map that did not generalize would be useless. But the value of a map depends on how well its generalized geometry and generalized content reflect a chosen aspect of reality. (p. 25)

In the field of ed-tech it is fair to say that there has been one map that has come to be the dominant way to make sense of the terrain. It is a map that reflects a reality that can be traced back to at least the 1860s. Halcyon Skinner's patent for a device for teaching spelling (Benjamin, 1988, 703) was the first of a number of explorations of the notion of automating some teaching practices. The involvement of machines in one way or another in teaching was prompted by an interest in, at first, improving

efficiency. Fast forward to the early days of computing in education and the improvement rationale has broadened to improving more than efficiency. It now is concerned with improving, among other things, learning. It is a familiar association—computers and improving things. Computers have been deployed to improve productivity across numerous fields of human endeavor. In this sense, as the logic goes, why should education be any different from banking, the military, business, or medicine?

The now familiar map of ed-tech is one that clearly highlights those features of the terrain that are associated with improvements in learning and the associated and necessary change of practices and policies to support such improvement. If we persist with our mapping metaphor a little further, we notice that the edge of the map, the known frontier, is one that develops very quickly. As each new digital technology appears, it has to be mapped (and often measured) in one way or another. It has to be judged to be of educational interest or significance, or not. Each new landform is not obviously educational; work has to be done to mark it as of little significance or of educational value. A good deal of effort goes into finding educational problems for which each new landform is a solution (Bigum, 1998). In a broader account of technology, Ursula Franklin (1999, p. 106) describes this work as that done by unpaid product development engineers.

Larry Cuban (1986, p. 8) offers a glimpse of this work, albeit not associated with computers, when he included a 1927 photo of a teacher conducting a geography class in an aeroplane[3] flying over Los Angeles. In the photo the teacher is standing and pointing to a globe. The children are seated in the conventional classroom desks of that era. The cabin has been remade into a classroom, complete with clock and blackboard. The photo is entitled, *Today's Aerial Geography Lesson*.

This example taken from Cuban poses a number of questions useful for our purposes here and for the kind of critical effort we are arguing for:

- Is the map we are looking at a map of digital technologies or a map of educational practices?
- Who gets to add to the map?
- Are there other maps of the field of ed-tech, what alternatives are possible, and who might make them?

Borrowing an idea of David Turnbull's (2000), we take the Fool's Cap Map as a useful device to further develop our mapping metaphor, and our initial mapping of the ed-tech imaginative. The Fool's Cap Map shows an image of a court jester with the face replaced by a map of the world.[4] Similar

to Monmonier, Turnbull suggests maps necessarily hide things. He suggests one way to read this image. That is

> All seemingly universal truths, all apparently trustworthy knowledge or authoritative maps, are partial and untrustworthy in that they conceal a hidden social ordering. This may be seen in the analogous role of the jester who confirms the king's power through mocking him. (p. 91)

While we don't intend to play the jester for the remainder of this chapter, we nevertheless will draw on the idea and remain mindful that any new imagining of the field of ed-tech, any new mapping will be as susceptible to "taking our knowledge for truth" as those who are engaged in making the well-established map of ed-tech. In Turnbull's words, "We who purport to be historians, sociologists, or cultural critics, are also tricksters" (p. 91). With this in mind, we return to the map of interest, the mapping of ed-tech and the improvement of learning.

Mapping Two Levels

The association of computing and related technologies with *improving* things is a kind of *default* logic. Why else would you deploy computing technologies if it was not to improve something, make a process more efficient, do things that otherwise could not be done? So too in education. The research literature associated with ed-tech is made up of an almost unending number of studies that look for improvements in learning. When these studies are combined with allied research that is directed at changes in policy and practice to support improved learning via ed-tech, the size of the corpus dwarfs other research and scholarship. For instance, there has been considerable attention paid to the *integration* of computers into classrooms, or indeed the use of computers and other online spaces *as* classrooms, the need for teachers to have so-called "technological and pedagogical content knowledge" (Harris, Mishra, & Koehler, 2009; Koehler & Mishra, 2009; Mishra & Koehler, 2006) and, more recently, for teachers to be proficient with social media (e.g., Callaghan & Bower, 2012).

Support for the focus on learning comes from the learning sciences, cognitive psychology and, more recently, social neuroscience. There is a vast literature concerned with cognition and it has necessarily played an important role in framing and shaping policy and practice in education. Its extension into and in support of ed-tech research is understandable (see Johnson, this volume). But, as will be evident in the chapters that follow, what is taken from the learning sciences is selective.

We have noted that the map of ed-tech that is commonly accepted to be *the* map has, as a consequence of ongoing developments in various digital technologies, an ever-expanding frontier. Indeed, doing work that is at the *edge* of the map is an important characteristic of a good deal of ed-tech research and scholarship. The patterns of research and enquiry that are underpinned by a rapidly developing set of digital and related technologies can continue and be repeated ad infinitum. It is possible to continue to ask banal questions that compare blackboards with interactive whiteboards or iPads with books, or examine the merits of particular pieces of online software. There is a narrowing of focus. It is akin to what Dr. Ian Malcolm, a character in Michael Crichton's (1990) novel, *Jurassic Park*, called thintelligence.

> They don't have intelligence. They have what I like to call "thintelligence." They see the immediate situation. They think narrowly and they call it "being focused." They don't see the surround. They don't see the consequences. That's how you get an island like this. From thintelligent thinking. (p. 284)

We believe that a continuance of these patterns of research and scholarship will consign the field to little more than a pseudo-scientific component of the marketing arm of companies that produce the various digital artifacts, which keep practitioners and researchers busy locating problems for which the artifacts can be solutions. A more worrying consequence of the hubris is that the field becomes limited in what it pays attention to and is always confident that no matter what happens it has the research approaches to deal with any new development. It is a recipe for more of the same for policy and practice. It is a recipe that has overseen a limited and limiting approach to thinking about computing and related technologies in education for more than three decades. The challenges of narrow policymaking in this area, characterized as it typically is by short-term deterministic thinking, are explored by Rachel Buchanan, Kathryn Holmes, Gregory Preston, and Kylie Shaw in their chapter. They point to the way successive governments in Australia and, by implication, in other parts of the world, regularly make policy outside of any real and situated context. We are of the strong view that the serious challenges posed by recent and future developments in digital and related technologies warrants the kind of serious and considered attention to context and history, amongst other issues, that is modeled in the chapters of this book. Dimitrios Koutsogiannis' chapter is an excellent example of this sort of focused attention to local/personal, national, and global contexts and histories and how these mediate the critical digital literacies of young people and the exchange value

that these literacies might have in both vernacular settings and in formal educational contexts.

Crichton's fictional account underlined the importance of unintended or unexpected outcomes when any new technology is deployed. It is a feature of the ed-tech map that such outcomes are rarely acknowledged and even more rarely examined. In their landmark study of the impacts of computer-mediated communication in an organization, Sproull and Kiesler (1991, p. 4) distinguished between what they termed first- and second-level effects. First-level effects are "the planned efficiency gains or productivity gains that justify an investment in new technology," for instance, an ed-tech claim would be "we will improve student literacy with iPads." Second-level effects are *unintended* or *unanticipated* outcomes. As Sproull and Kiesler point out, these second-level effects arise because when the new ways of doing things are put into place, "people pay attention to different things, have contact with different people, and depend on one another differently" (p. 4). So, in the case of the introduction of iPads into schools, it would not be unusual to see accounts which report that "some of the students are using their iPads to develop apps, others are designing games." In other words, *things change*. Because things change, attempts to examine whether or not things have improved become pointless. These second-level outcomes don't get mapped. They don't fit the logic of improvement.

Since Sproull and Kiesler's historic study, there have been scores of studies that have confirmed this two-level thesis in various ways (Jackson, 2007). This finding has gone almost completely unnoticed in the field of ed-tech research. Other approaches to looking carefully at what happens when ed-tech is deployed in a particular setting and which draw attention to *things that have changed* tend to be bracketed out: "that's interesting, but what has it got to do with improving student learning?"

To begin to address the problems we see in much of the existing research, we think it is important to name this problem and acknowledge its obduracy. As Gregory Bateson (1999) put it:

> There is an ecology of bad ideas, just as there is an ecology of weeds, and it is characteristic of the system that basic error propagates itself. It branches out like a rooted parasite through the tissue of life, and everything gets into a rather peculiar mess. When you narrow down your epistemology and act on the premise "What interests me is me, or my organization, or my species," you chop off consideration of other loops of the loop structure. (p. 492)

This book is directed at adding other loops, that is, at producing other maps of the ed-tech terrain. Joanne Orlando's chapter highlights the criticality

employed by teachers in their use of ed-tech and how teachers' responses to challenges and problems using new technologies can be very useful if taken seriously. The chapter by Susan Edwards and her colleagues points to alternatives with learning and teaching via digital play in early childhood. Mark Nelson, Stacy Marple, and Glynda Hull's chapter uses C. S. Peirce's notion of iconicity to explore young people's meaning making through their engagement with social media. Nicola Pallitt and Marion Walton develop the notion of "ludic gendering" in their exploration of children's playful and parodic gender performances in digital gameplay. Julianne Lynch's chapter opens a map on some equally marginalized practices and explores how the stories told about technologies support various sorts of politics and action. We acknowledge that each mapping (and remapping), invoking the figure of the jester, brings with it an assemblage of theory and practice, of heuristics and ways of thinking about knowledge and reality(ies). They are not limited to a commitment to a single idea. Collectively, there is an unruliness to them that we think is important in taking up the challenge of Selwyn's provocation.

Each chapter draws to some degree upon Selwyn's (2012, p. 10–12) heuristics for shifting and mapping the ed-tech imaginative, that is of

- moving from the "state-of-the-art" to the "state-of-the-actual"
- reflecting the social milieu of education and technology
- asking better questions of education and technology
- making better use of research methods
- making better use of familiar theory, and
- making more use of unfamiliar theory.

In some respects, these heuristics have informed some of the critical literature of the past. For example, the work of Kevin Robins and Frank Webster (1989, 1999), Larry Cuban (1986, 2001), Michael Apple (1988), Hank Bromley and Apple (1998), Steven Hodas (1993), Stephen Kerr (1996), and Chet Bowers (1988a; 1988b; 1990) are familiar names associated with critical work in ed-tech.

Critical agendas in ed-tech are not immune to our jestering. It is not difficult to identify a degree of repetition of research questions and a familiar reliance on many of the classic mainstays of critical theory.[5] Selwyn (2012) makes a related point:

> Until we have established a significant and sustained body of critical work that acts as a permanent counterbalance to the otherwise anodyne mainstream educational technology literature, then the points raised in this paper are as relevant now as they have ever been. (p. 15)

We, however, take the view that *more of the same* critically won't generate the counterbalance Selwyn argues for. More importantly, the challenges that digital technologies will pose for ed-tech into the near future are of an order and significance that we will likely need a robust *collection* of maps, even a critical miscellany.

Hastening Slowly and Legendary Thinking

The effectiveness of research and scholarship associated with the field of ed-tech has, in many respects, reassured those who work in the broader field of education that things in the ed-tech area were being well covered. There was no need for other research questions or approaches unless they could usefully add to the main map. There was also the sense that other approaches and maps were unhelpful.[6] While this might have been a useful heuristic in the early years of ed-tech, it is now a dangerous one.

To observe that "the digital" is everywhere, or soon will be, is to point to the acceleration of deployment of objects and devices that have computational and networking capacities. Phrases like "the internet of things," "Big Data," and "machine learning" flag developments that have already attracted the attention of ed-tech researchers and scholars. It is a simple matter to locate emerging research agendas attending to Sproull and Kiesler's (1991) first-level effects, adding to the main map. There is much less literature that seeks to map the unintended or unexpected.[7] Glenn Auld and Nicola Johnson's chapter makes an effort in this direction, making an argument for the value of mapping students' informal learning outside of school against formal curriculum outcomes. However, a key part of adding anything to a map is understanding how legends are used; in terms of our interests, the words used to represent the various ed-tech realities of interest.

Almost 40 years ago, Drew McDermott (1976) wrote a small article called, "Artificial Intelligence Meets Natural Stupidity." He had concerns about the nature of research in artificial intelligence (AI) that were not dissimilar to those of Selwyn's, ours, and other folk we have noted here. In the paper, McDermott criticized the use of *wishful* mnemonics like "understand" to label AI programs that did little more than process data in a particular manner. In the field in which this book is located, we have similar, *wishful* terms like "educational technology," "learning technologies," "networked learning," and the like. They are labels that are used to impose particular characteristics on hardware and software that are independent of context. The use such labeling receives from scholars who use these terms as glibly as vendors, clearly works against establishing a sharp sense of what is under consideration. At the very least it makes for a confusing and confused map,

at worst charts that might as well be for distant stars rather than the complex realities of sociotechnical practice.

Even the basic term *technology*, which is often used as a kind of shorthand for computing and related technologies, gestures implicitly to the social-technical binary, a long-standing cause for much debate and confusion in the field that can still be found in many publications. Trying to separate out the role humans play and those played by the artifacts that are not language bearing is a common occurrence in debates about policy and practice for many technologies, for example, debates about guns or automobiles are familiar to most. Each of these controversies spin around a separation of the social and the technical that inevitably lead to positions based upon social or technological determinants. We simply point to the problem to emphasize the importance, even centrality, of care in naming, which is of course also shaping. Michael Henderson takes up this issue in his chapter, examining the use and abuse of "community of practice."

Having a sense of the history of ideas, and of the field generally, is a key element in advancing any critically informed agenda. When it comes to material artifacts, the umbrella term technology appears very limp when compared with this account by Latour and Venn (2002) of his hammer:

> The hammer that I find on my workbench is not contemporary to my action today: it keeps folded heterogenous temporalities, one of which has the antiquity of the planet, because of the mineral from which it has been moulded, while another has that of the age of the oak which provided the handle, while still another has the age of the 10 years since it came out of the German factory which produced it for the market. When I grab the handle, I insert my gesture in a "garland of time" as Michel Serres (1995) has put it, which allows me to insert myself in a variety of temporalities or time differentials, which account for (or rather imply) the relative solidity which is often associated with technical action. What is true of time holds for space as well, for this humble hammer holds in place quite heterogenous spaces that nothing, before the technical action, could gather together: the forests of the Ardennes, the mines of the Ruhr, the German factory, the tool van which offers discounts every Wednesday on Bourbonnais streets, and finally the workshop of a particularly clumsy Sunday bricoleur. (p. 249)

In this book you will find similar, rich accounts that draw attention to features of the ed-tech terrain that are not as easily accommodated in the main map. They are small maps, incomplete and at times speculative. Taken together, and keeping the jester in mind, they offer pause for thought. They

rethink some of the taken-for-granteds of ed-tech. They problematize some assumptions about learning and teaching. We believe they provide a necessary broadening (an initial sketching of more and different maps) as well as a long overdue sharpening (better and different legends) of the ed-tech imaginative. *Festina lente* (Latin: make haste slowly).

Notes

1. A longer version of the paper was published in 2010 (Selwyn, 2010). We draw on both papers in this introduction.
2. Issues associated with representationalism are developed in the chapter by Bigum and Rowan in this volume.
3. The image is available online at https://iamliterate.wikispaces.com/Social+Studies+IRP
4. The image is available online at http://4.bp.blogspot.com/_VoFM4aW7x9A/TI_9JuOwl2I/AAAAAAAADSk/nTKn0hSVkqM/s1600/Fool's100.JPG
5. See, for example, Latour (2004).
6. See Selwyn's closing chapter in this volume.
7. In the broad debates about digital technologies, the work of Evgeny Morozov (2013) and Jaron Lanier (2010a, 2010b, 2011, 2013) are useful illustrations of different map making.

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