CHAPTER 9
Researching with Heart in Ed-Tech: What Opportunities Does the Socially Indeterminate Character of Technological Artifacts Open up for Affirming Emergent and Marginalized Practices?

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Introduction
In this chapter I draw upon theoretical concepts broadly consistent with a sociocultural view of technology to discuss a series of observations about emergent digital practices and school learning, and to raise implications for ed-tech research. Specifically, I seek to claim some space for—and to argue the merit of—“close-up” studies of the actual (Selwyn, 2010): studies that seek to document the diversity of doings that comprise technology use by young people in and out of school. Three main arguments are made:

1. Conceptualizing technology as indeterminate provides more sophisticated and more generative lenses for seeing new technologies and emergent practices than do more naturalized understandings of technologies as already-completed-things that can be known independent of the context of use.

2. Stories play an important role in what meaning we make from the use of technological artifacts in educational settings, serving as agents in what we authorize as valuable and what we see as possible. This is as true for the stories produced by researchers as it is for stories told by those teachers, parents, and students who participate in our research.

3. “Close-up” studies (Trowler, 2012) of marginalized practices can provide alternative accounts to those that take an authorized center as their starting point, thus affirming emergent practices and troubling tacit assumptions about schooling and the roles of educational research.
First, I introduce the concept of technological indeterminacy and the related notion of recontextualization. In this section I also own some of my own biases and preferences in terms of research foci and research agendas, drawing on the writings of de Certeau in a deliberate effort to focus on positions and practices that operate in the margins. I then introduce the role of stories within de Certeau’s theoretical project—their role as data that reveals the practical politics of technology use, and their advocacy role as both research participants and researchers seek to produce effects in the world. Second, I provide a series of examples of technology use, drawn variously from formal research projects, informal observations, and secondary sources. These examples are discussed in terms of the stories they might support and the politics of those stories, with a view to arguing that some tellings are more generative than others. In the final section, I raise implications for ed-tech research, arguing that ontologies based on indeterminacy can support research agendas that move beyond the limitations of representational thinking by seeking to promote opportunities for educational transformation.

**Conceptualizing Technology as Indeterminate**

The field of ed-tech research has been criticized for a predominance of studies that fail to adequately engage with the socially constructed nature of technology (Selwyn, 2010) and that instead rely on and propagate narrow, naïve, and misleading conceptions of technology (Bigum, 2012). Such studies often focus on the effects of technology on learning. Bigum (2012) reflects that, “as each wave of ICTs has been taken up in formal education settings it has been followed by a raft of studies that set out to examine improvements and effects” (p. 20). Similarly, Selwyn (2010) describes a dominance of “an (often abstracted) interest in in the processes of how people can learn with digital technology . . . and [with] the design, development and implementation of ‘effective’ learning technologies” (p. 66). Elsewhere (Lynch, 2006), I have expanded upon this
argument and provide a critique of “effect” studies that treat technology as an already-made thing that is known without reference to the context of use and which will have some determinable effect on the learning of students. This emphasis on the learning effects of technology emerges in a broader social science research context influenced by a privileging of what Trowler (2012) characterizes as the hypothetico-deductive tradition, where studies have as their goal the development of predictive theories: “in Z conditions, if X happens then Y will follow” (p. 274). Such studies are premised on deterministic views of technology; so, in Z conditions, if X technology is introduced then Y will follow.

Although the influence of the hypothetico-deductive tradition in the social sciences has been subject to academic critique for numerous decades because it serves the status quo in education, stifles innovation, and serves majority thinking (and majority groups) (Trowler, 2012), desires for predictive theories still dominate both popular and professional discourses of technology and schooling and are still a salient feature of mainstream ed-tech research. Within education research, the desire to develop predictive theories goes hand-in-hand with a desire to build technicized understandings of best practice (Trowler, 2012), thus serving neoliberal agendas of school reform and school effectiveness (Anyon, 2009; Connell, 2009; Davies, 2003; Groundwater-Smith & Mockler, 2009). When we see technology as indeterminate—as subject to ongoing material, semantic, and symbolic negotiations—the pursuit of predictive theories of linear effects becomes as nonsensical as the pursuit of a suite of teaching techniques that will ensure improved learning outcomes.

The notion of technological indeterminacy can be found in numerous theoretical traditions.¹ I wish to revisit this concept and the related idea that technology usage necessitates a recontextualization of the technological artifact—a neverending process through which the
technology comes to be. I have selected these particular concepts for focus here because of the emancipatory possibilities that such a conception of technology offers: seeing technology as essentially indeterminate positions users of technology as powerful shapers of technology. It is a view that is intentionally provocative, throwing up a challenge to more naturalized views of technology as an already-complete product and of users as passive consumers or receivers of technology (Lynch, 2003). I am particularly influenced by the writing of de Certeau (1974, 1984) who deliberately sought to document sources of alterity found in everyday practice and in doing so privileged the agency of users, and challenged the producer-user dichotomy (Ahearne, 1995).

In everyday language, *technology* usually refers to material artifacts or machines and, sometimes, to techniques. In this chapter, broadly consistent with a sociocultural view, I use the term technology to refer to more than the material elements of a tool (cognitive or material), machine, or a technique; technology is a purposeful endeavor and, therefore, it always has a social aspect. It is the social aspect that makes a particular technical artifact meaningful and that supports arguments that the meaning of technology is always multiple, is always socially negotiated, and always involves relations of power. Instead of seeing technology as an already-made product, the concept of technological indeterminacy holds the meaning of a technological artifact to be relational, subject to continual negotiation and renegotiation. From this perspective, usage always involves a recontextualization, where the materiality, intentionality, and micropolitics of a particular context of use inscribe the technological artifact as it emerges as a technology in/through use. In his analysis of everyday practice, de Certeau’s (1984) notion of reuse emphasizes the agency of users and “the secondary production hidden in the process of . . . utilization” (p. xiii), where users of cultural artifacts appropriate them for their own diverse (and often divergent) purposes. Thus, the meanings of cultural artifacts, including those we might
popularly refer to as “technologies”, are destabilized; their meaning is essentially indeterminate prior to the inscription of meaning through usage.

If technology is essentially, by definition, indeterminate, then, I can describe the features of a device—its dimensions, the materials it is made of, the functions it affords (within the limits of my own imaginings or as intended by the designer), but I cannot, in an abstract sense, describe its meaning as a *technology* until it is contextualized, embedded within a larger assemblage of objects, processes, intentions, impacts, and (of course) power relations, and even then its meaning will be multiple and unstable. A particular manifestation of a technology may in fact be a fleeting phenomenon, glanced momentarily over the shoulder of a teenager as she uses her smart phone under her desk in a math lesson to plan her evening. Once the phone is confiscated by the teacher and placed on a desk at the front of the room, it sits there—the same device—but not as the same technology. It is now part of an assemblage of consequences, a broader technology of control, serving different purposes all together, though possibly revealing the same set of power relations, disrupted momentarily, but now reinstated. In his discussion of de Certeau’s writings, Ahearne (1995) characterized de Certeau’s conception of texts (in our case, technological artifacts) as having “a peculiar in-between status”: they only exist for users “in the act of appropriation, and yet this act alters [them]” (p. 173).

Numerous theorists have put to work concepts and terminology in order to describe the indeterminate character of technology. Because of my interest in “close up” studies of surreptitious and/or marginalized practices, and my belief that the propagation and circulation of ideas and stories can make a difference in the “reconstruction” of the world (Trowler, 2012), I’m attracted to de Certeau’s (1984) conception of this type of recontextualization as an underground consumption that sees consumers inscribing products with their own agendas:
It seems possible to consider these products no longer merely as data on the basis of which statistical tabulations of their circulation can be drawn up or the economic functions of their diffusion understood, but also as parts of the repertory with which users carry out operations of their own. (p. 31)

This understanding of “products” and of consumption offers the potential for positioning student- and teacher-consumers as innovators who opportunistically make products part of their own repertoire for action. The stories recounted in this chapter provide examples of this type of production.

If we accept a degree of technological indeterminacy, then how a given technological artifact might manifest is largely dependent on how it is storied into existence. In terms of the politics of technology use, this indeterminacy is a double-edged sword; it opens up the potential for user-generated innovation, but it also brings with it the risk that (re)contextualization will result in a “domestication” (Cuban, 1986) or “schooling” (cf. Illich, 1971) of technology, bringing with it familiar power relations and patterns of success. And maybe both are true and more, and that the degree of user-generated innovation is in part a function of the stories that are told that unearth it and make it visible. My own biases are apparent in the phrasing used here: the schooling of technology is described as a “risk”; subversion as an “opportunity.” Underpinning the arguments made in this chapter are my own personal and professional history, biases, and agendas. These biases include an interest in teaching and learning practices that empower young people to be active authors of their own lives and agents in their own learning; that position students as sources of expertise and producers (rather than consumers) of knowledge; and that are based upon or build upon authentic links between the world of school and young people’s lives outside of school. In addition, consistent with this interest, is a desire to undertake research
that supports teachers and schools in these types of agendas, particularly with regard to traditionally marginalized and disadvantaged students. In his discussion of the role of theory in research, Trowler (2012) identifies the approach to research that I am adopting here as the theory-as-emancipatory perspective within which research and theorizing is seen as a political act, where “the world is constructed and reconstructed through theory” (p. 277). There is a synergy between such perspectives and the research work supported by what Thrift (2008) refers to as “non-representational theories,” de Certeau’s project being an example of this, where research “can’t be measured in terms of its descriptive realism but should be judged in terms of its ability to generate new possibilities in an encounter with the ordinary” (Highmore, 2006, p. 17). This is research work that seeks to tell generative stories of the particular, rather than to produce generalizable theories.

“Storying” Marginalised Practices

The notion of story is central to the arguments made in this chapter. In the sections that follow, I present a series of stories, and I also discuss research as a type of story-telling. For de Certeau, stories are understood as playing both a determining and a revelatory role in everyday practice, with the determining role understood to be primary. Stories are productive, not representational in that they do not provide access to the real but enact a discursive production. In his writing about the relationship between theory and practice, de Certeau (1984) argued:

In narration, it is no longer a question of approaching a “reality” (a technical operation, etc.) as closely as possible and making the text acceptable through the “real” that it exhibits. On the contrary, narrated history creates a fictional space. It moves away from the “real” . . . it makes a hit (“coup”) far more than it describes one . . . it produces effects, not objects. (p. 79)
Stories produce notional boundaries of practice by “authoriz[ing] the establishment, displacement or transcendence of limits” (p. 123); they reveal the perceived limits of practice as well as moments when limits are crossed and reset.

So what are the connections between the productive role of stories, technological indeterminacy, and the work of ed-tech researchers? The answer to this question is at least two-fold. Close-up research that seeks to investigate the micro-level happenings of educational technology necessarily draws on stories that are contrived as data—often a combination of stories constructed based on direct observation by the researcher and those provided by research participants (teachers, students, parents). At a meta-level, as researchers, our analysis and reporting processes construct stories of the practices that are being researched. This is true of all research, but is particularly apparent in research writing that focuses on everyday practices as embodied, relational undertakings that are contextualized in place and time, where researchers self-consciously represent their work as a particular telling of these practices.

So story telling is central to this type of work, as both a data source and as an output. It is through stories that the recontextualization of technological artifacts—their realization in place and time as technologies—is discursively produced. From the point of view of research that seeks to challenge the status quo in schools and to support change, stories provide insights into what is constructed as the limits of practice, as well as to moments in time when those limits are challenged or crossed, when new possibilities are imagined, and when new limits are negotiated. And at the meta-level, the research stories we produce through the dissemination of findings potentially produce effects in the field of ed-tech research by bringing attention to and effectively amplifying the significance of innovations that are other to practices authorized by convention or by institutionalized expectations and requirements.
Three Stories: Affirming Marginalized Practices

In this section I provide a series of stories, each of which are discussed in terms of the different ways that emergent (often marginalized and sometimes vilified) practices are discursively constructed. I examine them for how the limits of authorized practice are produced, and for the telling of moments when these limits are crossed. In doing this, I seek to affirm the generative possibilities found within these stories in terms of founding a space for recognizing the innovative work that often characterizes technology use. As emphasized in de Certeau’s work on everyday practice, the types of practices that are foregrounded in this chapter are marginal in that they are not ordained by the center, but they are not unusual or minority practices—they may be minority in status, but they are major in their proliferation. The stories told here point to common everyday work that has been normalized within some/many communities but which continues to be constructed as marginal to the proper business of schooling. The examples include observations of young children using iPads in unsettling ways in their homes; a teacher realizing the challenge that new technoliteracies pose to the established order in early years literacy education; and a school student’s neglected account of a micro-level innovation within an iPad app.

Kids Using iPads: The Politics of Appropriation and (Re)Deployment

In 2011, my twin sons each received a first generation Apple iPad for their sixth birthday. I was charged with preparing the iPads, so downloaded a range of apps, including a number of gamified early literacy and numeracy apps—designated educational through their categorization in the Apple App Store—as well as a number of doodling/drawing/art apps, a construction app, and some interactive books. I had expected the gamified literacy and numeracy apps to be popular: they are produced to be suited to, and to appeal to, children of this age. However, I was
surprised to observe that the bulk of these children’s time on the iPads was actually spent producing their own content and saving it in the photo stream by taking a screen shot (in fact, they showed very little interest at all in those apps downloaded from the Education category in the Apple app store). Instead, they showed an unprompted interest in making stuff, and in no time at all, and with no support beyond being shown how to save an image of the screen, they were moving their products from app to app in order to manipulate them and to take further screen shots. In less than three months, I counted 788 images on one of the iPads, all user-generated works of art and other visual constructions or snapshots of activities or work in progress; the second iPad housed a similar number. Figure 9.1 shows one of these creations, an image first created in JellyDoodle™ (the image of a heart, covered in candies, on a black background) and then taken into FaceGoo™ where the image was pinched to create the distortion in what was originally a rectangular image, and the sunglasses were added.

There are a number of things of interest here: first, the gap between imagined use (my own as a parent) and actual use. I realize now that my initial actions in preparing the iPads are similar to those I have observed in teachers of children of this age whose first point of call for preparing classroom iPads for their students is to look for content; and the content that is most obviously suitable for “educational” purposes are those that support the learning of skills that are center stage of the early years classroom—print-based literacy skills. I also realize that my initial actions were a feeble attempt to be a good parent, and even at the time of writing (17 months later), aware of the marvelous things that children can do with iPads and of all the unintended, previously unimagined learning that has taken place, I still have a nagging need to limit “screen time” and to try to direct their usage toward some apps and away from others, based on my
conception of relative educative value, which is heavily influenced by “schooled” notions of learning and learners.

A further area of parental concern was the way my children treated the devices. Consider the photo shown in figure 9.2.

This photo shows how one of my children decorated the surface of the iPad with faux jewels and a sticker. My first reaction as a parent charged with guiding my children’s behavior was to doubt the wisdom of these decorations. To me, the iPad is “top-shelf” technology—it’s costly and it needs to be treated with special care. To my son, it was yet another surface, no different from other possessions that have been marked in this way. Given the opportunity, users will make technological artifacts their own. Is this an enculturation, a win for consumerism where the artifact becomes a fashion accessory, or is this an appropriation and redeployment by an agentic young person as he shapes his world, effectively a reinscription and assertion of ownership or even authorship? Or is it both, and does it matter if it is both?

The image of the decorated iPad is evocative of earlier images. In her study of the Minitel—a video-text system piloted in homes in Norway in the 1990s—Berg (1994) noted how women were concerned about the appearance of the device and how well (or not) it would blend with the aesthetics and décor of their homes, and that they made use of the Minitel in unintended (by the designers) ways to gather information about their neighbors. Instead of using this new technology in the way that was intended, the women in Berg’s study adapted it to fit with their own needs and agendas. Berg describes how women’s use of the Minitel was constructed by the designers as deviant and in derogatory terms.
Both the diamanté iPad and the Minitel serve as examples of a particular type of consumption. Each story contains an authoritative and disapproving character—the parent and the designer respectively, yet the users recruit the technological artifacts to their own desires and use them as sites of negotiation of their own roles, identities, and territories (the “clandestine” (re)use that de Certeau describes as characterizing everyday practice).

If we view technology as indeterminate and focus on (re)use and on what young people do do with technology, then the stories that emerge are quite different than those driven by a view of what ought to or might happen, and their politics is different. Stories of (re)use foreground the creativity and innovation of users and position them as producers of technology. In both examples, rather than the technological artifact being a deliverer of content, it is objectified and becomes a product of the users’ desires. This type of usage can be seen in all manner of contexts, particularly when the affordances of the material artifact are such that the device can be put to work in support of diverse projects. In fact, creative (re)use is arguably one of the defining features of new forms of cultural production (Lessig, 2012) and mobile learning (Pachler, Bachmair, & Cook, 2010). This can be seen both in the innovative ways that users put to work technological artifacts and in the ways they work with content, appropriating and redeploying it to create new cultural products.

My children proved themselves capable well beyond my expectations in terms of their facility with the iPads and their self-initiated innovation. It is not uncommon for young people’s capabilities to be underestimated. They are certainly underestimated by the formal curriculum documents that define desired performance standards with information and communication technology (ICT). Both of my sons’ mid-year school reports that came home in 2011 note in the area of ICT that these children are “becoming more familiar with icons on the computer
Perhaps I should not have been surprised about either 1) my children’s interest in, and facility with, the creation of stuff, or 2) their school reports’ failure to recognize their abilities and interests. On the first point, multimedia production, innovation, and improvisation are found (as they are with all young children) in their play outside of the iPads in the nondigital world (my distinction; not theirs). This sort of play is well documented in the research literature on early childhood, as are the “cross-overs” (Edwards et al., this volume) between traditional play objects and digital objects. For example, O’Mara and Laidlaw (2011), observing their own children’s play, describe play scenarios where the children assemble digital and nondigital objects in innovative ways, noting that “the boundaries between ‘physical’ and ‘virtual’ blur with all play objects” (p. 150), and Davidson (2009), also observing children’s use of technology in their own homes, notes how they move seamlessly between media, modes, and channels, both traditional and digital. Mavers (2007) frames this type of play as “semiotic resourcefulness” and notes the un-school-likeness of young children’s “domestic literacy.” Each of these authors note the challenge that such observations pose to formal education practices and the opportunities offered.

However, despite this evidence of even very young children’s innovative capacities with digital media, schooled notions of suitable and appropriate behaviors and learnings have an extremely strong influence, and within the framework of possibilities that governs the assessment and reporting of learning in schools, there appears to be little space for recognizing these capacities. If we use conservative curriculum frameworks as our starting points for storying children’s technology use, the stories told then risk being contained by such frameworks, such that we fail to recognize and then neglect to foreground and propagate the transformational opportunities. De Certeau’s theorizing invites us to start on the ground with what people actually
do and with the stories they tell about their practices. In the story I have relayed above, there is discursive work apparent in the setting and the transgression of limits that raises questions about what does (and what does not and perhaps ought to) count as “educational”; what does (and does not) count as “appropriate use”; and about what does (and does not) count as a meritorious learning outcome. Limits are also apparent in my attempts to codify iPad practices through terms like screen time that fail to tell of the heterogeneity of these practices, and through the distinction between digital and nondigital that belie the complex, relational, hybrid nature of technology use. These discursive limits point to the authorized spaces that revolve around children’s use of iPads, and the stories of transgression of these limits point to (and perform) possibilities for storying new spaces.

**Teachers and Students with iPads: Colliding Constructions of “Literacy and Technology”**

The previous section focused on observations of out-of-school technology use by young children. In this section, I relay some observations made in a school context with the same age group.

From 2010 to 2012, a colleague Terri Redpath and I had the opportunity to observe, and inquire of, how iPads were being used in a preparatory (prep) classroom in a small school in rural Victoria, Australia. From a view of technological indeterminacy, the iPads manifested in diverse ways—as a surface for practicing print-based literacy skills; as an interactive book; as a medium for surreptitious game play; as a toolbox for creating multimedia products; and as a channel where products can be shared and communities formed. Of particular interest to us, as teacher educators, was a story told from the teacher’s (Monique) point of view of her efforts (sometimes successful, sometimes not) to recruit the iPads to her own interest in creating a
Monique explained to us on several occasions that her goals for teaching included supporting her students to become self-directed learners who move seamlessly and as needed between media, modes, channels, and tools as they practice and build upon their literacy skills. Across 2010 and 2011, we documented some of Monique’s classroom practice—together with her reported views and those of her prep students—with a focus on how iPads were being used in the classroom. The story told in Lynch and Redpath (2014) is one of Monique’s initial frustration at the limited ways she and her students were using the devices (as an interactive space for practicing print-based literacy skills and as a library of interactive books that served as stimulus for a follow-up writing and comprehension exercise), and then one of triumph where a learning activity is documented that has some of the characteristics that Monique aspires toward in her teaching. The learning activity involved students in the production of “alphabet books,” where they each designed and created a number of images using a drawing app called Doodle Buddy™, then they each brought their images into another app—Sonic Pics™—where they recorded voice-overs (matching initial sounds with the drawn images) as they moved from image to image. Each alphabet book was then exported as a movie to a YouTube channel from which it was shared with others, both within and outside the school.
Mavers (2007), in her study of the home literacy practices of a six-year-old child, makes the distinction between *becoming* literate and *being* literate, where much of the literacy work that children undertake in schools is about *becoming* literate and developing skills that might be used *for real* in some imagined future. In Monique’s reflections on the alphabet book activity, she stresses that the learning focus of the activity from her point of view “wasn’t about the sounds and the letters” but about enabling her students to create and communicate a product and to realize the power that they have: “they’re learning that they can do something and then show the world. At the start they probably though it was about the sounds, but I think, now that they’ve finished it, they’re sort of starting to think more about the applications that they used and the power of it.”

In an interview with one of Monique’s students, he explains that the alphabet book that he made could be used by other children to help them to learn their blends (my word) and sounds. There was a focus in the activity on purposive meaning making (“technology as a medium for meaning-making”—Burnett, 2010, p.254), rather than on learning decontextualized skills in isolation or rehearsals for future meaningful contexts. The work done with the iPads resulted in a product that held meaning for the producer and that was *audience* in personally significant ways, and is therefore more about participation in a media culture than it is about preparation of students for some imagined literate future.

Numerous stories could be generated in order to recount Monique’s practices in relation to the iPads. From the point of view of expectations around the prescribed literacy block (Ohi, 2008), Monique’s initial use of the iPads for practicing print-based literacy skills would be seen as consistent with best practice, where the iPad is put to work as a “deliverer of literacy” (Burnett, 2010, p. 254). This version of the story would construct Monique as a “good teacher”
within contemporary discourses of teacher competency (Connell, 2009)—as a technician who functions as a conduit of ordained skills, and would position the students as receivers of knowledge. This version would relay the story that I briefly recounted (reconstructed) above as one of degeneration, a divergence from the core business of schooling. In interview, Monique demonstrated an awareness of this other story, “I did it in a reading group time, so I pretty much—instead of doing guided reading—which was a bit naughty—I used that time to show them the video I made that had the instructions on how to do it.” Monique then went on to justify the activity against traditional literacy goals, pointing out that it was indeed “a comprehension activity” and “a procedural text.” There are at least two ways to read Monique’s justification. This other story, never actually told, can be seen as a shadow on Monique’s reflections on a learning activity that was successful by its own standards but that does not align well with institutionalized expectations. Alternatively, it can be read as an appropriation of authorized discourses (about types of texts and types of literacy activities) and a (re)deployment of institutionalized terms in the service of her own personal and professional desire to position students as users of literacy, and as producers of knowledge, who have a voice within communities of their own construction. This story (and the stories in it) points to teacher compliance and to notions of literacy and appropriate literacy pedagogy as limits of authorized practice. However, the redeployments (of resources, of class time) that cross these limits suggest new possibilities for conceiving of teacher practice where it is both compliant and innovative, where it both meets the requirements of the authorized curriculum and enriches teacher and student learning by crossing into new territories and allowing these to speak back to institutionalized practice and institutionalized notions of literacy.
A Clever Bit of My Brain: User-Generated Contexts and New Forms of Cultural Participation

The story of Monique is also a story of the iPads that manifested in numerous ways in this particular classroom. I have referred to the iPad as a deliverer of literacy (after Burnett, 2010). Some iPad apps are more closed than others (Lynch & Redpath, 2014), in that they are designed to deliver a particular content or a particular experience. Within early years education, this sort of app is typified by the gamified literacy app (e.g., reD Writing™, Pocket Phonics™, and the ABC Reading Eggs™ mobile apps) noted here and earlier in relation to my own children’s iPads. Closed literacy apps are designed to guide users through activities that support the rehearsal of print-based skills at increasing levels of difficulty, with the user rewarded with tokens of achievement (digital stickers, chimes, points, cheers, certificates) for each success. This type of app is quite distinct in terms of design from those that are intended to support the creation of a user-generated product—an artwork, a photo story, or some other multimedia product (e.g., apps such as Sonic Pics™ referred to earlier, Puppet Pals™, Art Set™, Eden World Maker™). The closed apps are intended to stand-alone—their architecture is such that an ideal user is imagined as staying within the pathways defined by the app. Open apps are those that more obviously lend themselves to usage that moves across numerous apps, platforms, and networks (as seen with the alphabet books and in the artwork shown in figure 9.1), depending on the needs of the production process. Within each of these broad categories, we see variations of “openness” and “closedness” represented by particular apps. In addition, there are other categories of apps that can be analyzed in terms of the degree to which they are intended to predefine user behaviors and the degree to which they are intended to promote user choice, such as interactive books that offer differing degrees of interactivity and of choice.
However, the concept of technological indeterminacy and de Certeau’s conceptualization of everyday practice suggest that these built-in affordances can be subject to (re)use that are counter to what was intended in the design. Pachler et al. (2010) argue that new media cultures, supported by the convergence and ubiquity of mobile devices, challenge traditional notions of audience and consumption, replacing them with participation and production, such that content is always fodder for further creation:

The relationship between producers and users of artefacts is becoming increasingly blurred and the relationship of the user with the cultural artefacts they engage with in the process of knowledge production is frequently one of re-use underpinned by a fundamentally different attitude towards text as open, instead of fixed, and subject to constant modification, as well as text as comprising different modalities to be (re)contextualised according to specific situational requirements. (Pachler et al., 2010, p. 12)

And within this culture, production too has new meanings and evidences new literacies, “favouring selection, ‘capture’ and transformation rather than ‘production from scratch’” (Pachler et al., 2010, p. 191). This is the culture of remix, “where people participate in the creation and re-creation of their culture” (Lessig, 2012) and, within this culture, closed environments like those I have referred to above are open to counterplay (Apperley, 2010). In the case of the iPad, the ability to capture a screen shot that can be brought into another app, transformed, re-used, recontextualized, and circulated amongst a community generated by the user-producer means that all apps are potentially available for appropriation and redeployment in the service of any number of yet unimagined purposes. Even the most static ebook or the most prescriptive game sequence can be excerpted from its original/intended context, animated,
annotated, and re-audenced with ease. Such productions are supported by new literacies, known as transliteracy (Ipri, 2010; Thomas et al., 2007) or technofluency that include skills and dispositions that even very young children make their own very quickly, such as moving between media, tools and platforms that combine traditional and emergent literacy practices.

These types of complex media performances can be found in any classroom where children are given space and time to work with digital media, but they are not always seen and are seldom the focus of stories about children’s technology use in schools because they fall outside of the net of assessment and reporting regimes. Even in a context where meaning making and innovation are explicitly valued, child-initiated innovation can be overlooked. One of Monique’s students (Jack) was interviewed by the school principal (Monique filmed the interview with her iPhone) about his alphabet book. In the interview, the principal invites Jack to show his movie, to explain how it works, and questions him about who might be able to view the movie on YouTube and who might be able to use it and for what. This questioning is intended to (and does) scaffold a celebration of the Jack’s accomplishment, and a recognition that he has made something truly valuable. However, even with this good intention, the interviewer fails to see this child’s user-initiated innovation. Jack tries to tell a story of innovation at the micro level, his (re)use of one of the tools found within one of the apps: Told with much excitement as an aside to an answer to one of the principal’s questions, Jack explains how he used the eraser tool within the Doodle Buddy app to create a letter “g” using negative space—“See I did coloring [child gestures coloring action] all blue and then I used the rubber to rub out the shape of a ‘g’ [child gesturing shape of ‘g’] . . . that was a clever bit of my brain.” In this story, Jack is an innovator who is aware that his use is counter to the norm and he takes pleasure in this knowledge. These stories, told in a moment, can so easily be overlooked because, although they
sit within the field of an authorized activity (e.g., the learning activity as understood by the principal, and the tools of the app as usually understood and used), they do not follow its rules. De Certeau referred to this everyday innovation as “a creative swarm”:

Bubbling out of swamps and bogs, a thousand flashes at once scintillate and are extinguished all over the surface of a society. In the official imaginary, they are noted only as exceptions or marginal events . . . In reality, creation is a disseminated proliferation. It swarms and throbs. A polymorphous carnival infiltrates everywhere. (de Certeau, 1974, p. 139–140)

Practice stories can provide access to the already present—but not yet authorized—innovations that characterize everyday doings. De Certeau’s work foregrounds everyday innovation as opposed to capital “I” innovation, providing a basis for foregrounding stories of marginalized practices. Such stories allow us to see practices—that to some may appear to be mere pockets of minor mischief (as misuse, as “off task”)—as potentially auguring a new world order, where remix, and conscious and owned re-use, becomes a new norm: no longer the exception but the intent. This supports the conceptualization of innovation, not as a scarce, costly, and definitive product, but as a common (everyday and everywhere) and ethereal practice that characterizes everyday cultural operations (de Certeau, 1974). The everyday innovations that characterize young people’s technology use—as illustrated by the example of Jack—are ever-present but not seen; they operate “below the thresholds at which visibility begins” (de Certeau, 1984, p. 93), obscured by the authorial view from above that tries to shape practices and outcomes (e.g., the view framed by a formal curriculum framework, or the standpoint of a parent or a teacher or a developer, seller, or patron of iPad apps). It is only through close attention to the story told by
Conclusion: Researching with Heart in Ed-Tech

In this chapter, I have embraced the notion of technological indeterminacy as a theoretical device that can be used to promote and to help realize the possibility that teachers and students can and often will do things differently. I argue that the construction and circulation of “stories” has an important role to play in the transformation of schooling through the production of counternarratives that affirm user-generated innovation. The three stories told above are intended to serve as examples of tellings that affirm micro-level innovation while also exploring some of their politics in relation to authorized and emergent practices. I have suggested that the types of practices described and discussed are no longer clandestine, quiet activities, but constitute a less marginal and more public assertion, where users exercise and claim power through the products they appropriate, objectify, and then redeploy for their own purposes and in their own names. These new learnings and new learner identities are not deviations from a norm as there is no norm. They have become as ubiquitous as the tools that support them, even in the most marginalized communities (e.g., Rogers & Winters, 2010). This is the story I wish to promote. And, although I cannot determine the effects of this telling, I am hopeful that it will contribute to an emerging message that there is a subsequent risk of schools becoming technologically irrelevant if they proceed as if unaffected by such practices. Schools are not closed platforms; they are part of a heterogeneous network and it is impossible to keep indeterminacy out.

The way we conceive of technology has implications for the type of research that we do and therefore what our research allows us to see and to enact. I have advocated a conception of technology as indeterminate, and of usage as necessarily a recontextualization that involves
appropriations and situation-specific (re)deployments. The recontextualization of technological artifacts often results in a “domestication” of technology, where conventionalized practices, and institutionalized structures and processes that emanate from an authorized center, define the types of uses that are ordained and counted as the proper work of schools (Bigum, 2012). I argue here for a proliferation of centers that emanate from the standpoint of users, and that is obscured if our frame of reference emanates from elsewhere. I argue—following de Certeau’s conceptualization of everyday practice—that technologies have been/are/will be “domesticated” but they will also be subject to everyday user-initiated innovation. Both of these things happen, with the latter being much more difficult for researchers to know. Close-up studies of actual usage, and research writing that seeks to illuminate everywhere-all-the-time innovation despite its marginal status, are critical if we are to build new understandings of practice in an ed-tech field that is fraught with the assumptions, agendas, and rhetorics of powerful stakeholders. There are inherent risks in such a project, particularly for academic researchers who seek to progress student-centered change agendas, but who write from materially and institutionally privileged positions that are removed from the practices being told. Indeed, there is a risk that my own tellings might (and likely do) erase stories of alterity that I am unable (or unwilling) to witness. This is an inescapable bind of authorship that is only partially mitigated (forgiven?) by explicit researcher reflexivity.

These issues concern both the ontological (how we conceptualize what technology and technology use is) and the epistemological projects of educational research (what types of knowledge effects we seek to have). Studies that seek to develop predictive theories through the implementation of pseudo-scientific designs are at risk of failing to attend to practices that might inform change, and of failing to tell stories that might perform change. There is a place for (and a
need for) studies that seek to amplify moments when ed-tech practices move outside of authorized practice, and that seek to authorize such moments for their potential to speak back to the status quo in schools. In this way, rather than seeking to construct a true representation of what is going on, the research story seeks to “[open] up a legitimate theatre for practical actions” (de Certeau, 1984, p. 125, original emphasis).

References


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Notes

1 Including social semiotics as discussed by Nelson, Marple, & Hull and by Bigum and Rowan in this volume.