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Slow EdTech: Pedagogical principles, collaborative explorations, and persistent challenges

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Slow EdTech: Pedagogical principles, collaborative explorations, and persistent challenges

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Abstract

This article describes two "Slow EdTech" initiatives, using this label to denote a focus on learning and the development of capacities for learning along with a mindful approach to the uptake of new digital tools that become available. One initiative, dating from 2001, is a set of guidelines about specific situations and specific ways in which specific educational technologies are of significant pedagogical benefit. The other, dating from 2013, is online Collaborative Explorations (CEs) for moderate-sized open online collaborative learning. The tools and processes used in CEs for inquiry, dialogue, reflection, and collaboration are designed to be readily learned by participants so they can translate them into their own settings to support the inquiries of others. Reflection on both initiatives points to the deeper source of challenges for Slow EdTech, namely, the political, economic and cultural context in which U.S. education is embedded.

> [T]he distinction between fast and slow technology is… a metaphorical distinction that has to do with time presence. When we use a thing as an efficient tool, time disappears, i.e., we get things done. Accepting an invitation for reflection inherent in the design means on the other hand that time will appear, i.e. we open up for time presence... Hallnäs and Redström (2001)

> The only thing for certain is that everything changes. The rate of change increases. If you want to hang on, you better speed up. That is the message of today. It could however be useful to remind everyone that our basic needs never change. The need to be seen and appreciated! [T]he need to belong. The need for nearness and care, and for a little love! This is given only through slowness in human relations. In order to master changes, we have to recover slowness, reflection and togetherness. There we will find real renewal. Guttorm Fløistad, on Slow Philosophy (cited in Riddle 2010, 45)

This article describes two "Slow EdTech" initiatives, using this label to denote a focus on learning and the development of capacities for learning along with a mindful approach to the uptake of new digital tools that become available. One initiative, by the first author, is from the dot.com era but remains relevant; the other evolved in response to the recent explosion of MOOCs (massive open online courses). Reflection on both initiatives points to the deeper source of challenges for Slow EdTech, namely, the political, economic and cultural context in which U.S. education is embedded.

Guidelines about specific situations and specific ways in which specific educational technologies are of significant pedagogical benefit

I (Taylor) learned to program computers as a student and young researcher in the days of IBM punchcards, and moved readily into using computers to design activities for my college students in the early 1980s. I had not, however, articulated well my philosophy of computers and technology in education until I joined a College of Education in the late 1990s and began to teach trainee and in-service teachers. In my first semester, the course project in "Thinking, Learning and Computers" was to "design an activity for a class, organization, or your own personal development [that] concerned the current or future consequences of using computers to aid your thinking, learning, communication and action in classrooms, organizations, and social interactions." One student, an in-service teacher, chose to make his project simply a demonstration of a new tool he had enjoyed learning at an all-day professional development workshop a year earlier. During the question period, I asked about the kinds of lessons he used the tool for. His answer: "Oh, I don't use PowerPoint in my teaching. I do not have enough time to prepare the slides."

I do not recall if I asked whether the PowerPoint professional development workshop included a module on planning to make time to prepare effective visual aids and rewrite lessons to incorporate them. I suspect that neither the workshop nor the report addressed a concern I had raised via the words of the computer pioneer Joseph Weizenbaum—When asked if one day computers could be designed to take the place of teachers, he replied: "Yes, computers could do that, but why would you want them to?" This was a genuine not rhetorical question, one to which teachers—and teachers of teachers—needed to have a considered response if educational technology were to be a sound investment of their time and resources. In that spirit, a few years later, when I had to teach "Computers, Technology, and Education" for two semesters, I looked for considered guidelines in publications, syllabi, and national standards for technology education (ISTE 2000). The prevailing standards detailed the software tools and skills that students should master, taking as given, as did the available texts and syllabi, that computers and other new technologies needed to be brought into education. Dissatisfied with the available materials, I formulated the text and guidelines that follow (Taylor 2007; for illustrations from science education at that time, see cases linked to Taylor 2002).

Overall Guidelines

Professional development for educators should not simply assume that computers and other new technologies are good for education and then try to maximize the software tools we master in the time

available. Instead, in learning about computers and technology in education, two objectives for the thoughtful and responsive educator are to: (a) make educationally justified and sustainable choices of when and how to integrate technologies, and (b) plan to learn through ongoing professional development how to use the technologies each of us decides to adopt or adapt. In this spirit, our efforts should be addressed at becoming acquainted with specific computer-based or digital tools and the ideas behind them, evaluating their effectiveness, and developing guidelines about specific situations and specific ways in which specific technologies can be of significant educational benefit.

It is important to acknowledge the context in which educators are developing their capacity to use technology effectively in education. Although the information potentially available on the Internet has rapidly expanded, knowledge, as the poet T. S. Eliot observed, can be lost in information. We need to provide tools for ourselves and for students that genuinely enhance learning. Among other things this means—as always in education—addressing the diversity of students' intelligences, backgrounds, and interests. In this multi-faceted endeavor, teachers trying to keep up with best practices will find many unevaluated claims, unrealistic expectations, and technologies imposed from above, as well as controversy, uncertainty, and rapid change. In the area of educational technology, therefore—even more so than in others areas of education— teachers need, in addition to objectives a) and b) above, to: (c) develop learning communities in which we help each other to learn about learning and think about change; (d) understand and respond to the push for teachers to use educational technology; and (e) examine the wider social changes surrounding computer use technology. In summary, professional development in the area of technology in education should enable educators to better fulfill the needs of our schools, communities, or organizations; address the information explosion; adapt to social changes; and collaborate with others to these ends.

Specific Guidelines

With respect to the first objective—Make educationally justified and sustainable choices of when and how to integrate technologies—consider each of the following guidelines (arranged in order starting from most important) for using computers [or digital technologies] as tools in learning and teaching:

1. To extend thinking

a. Use computers first and foremost to teach or learn things that are difficult to teach or learn with pedagogical approaches that are not based on computers (Dede et al. 2000; e.g., viewing chemical structures in 3D).

b. Make sure that learning or knowledge-construction is happening (Petersen & Jungck 1988), especially when asking students to use the Internet. In contrast, most existing websites are

designed more to transmit information than to ensure learning, which contributes to the epidemic of plagiarism from the web.

c. Model computer use on best practices to ensure learning without computers. For example, if you have ways to get students to read actively, try to incorporate them in assignments that involve accessing information from the Internet. If you have ways to maintain the interest of girls in traditionally male-identified areas of science and technology, then use them in maintaining the interest of girls in computers (Jenson et al. 2003).

d. Incorporate activities that identify constraints and keep alternative ways of thinking in mind, remembering that computers, like all tools, constrain at the same time as they enable. Included in such activities could be looking at the history and possible future changes that computers have brought in thinking about thinking (see objective e) under Overall Guidelines).

e. Consider whether software and its use meet the principles of "Universal Design for Learning" (Center for Applied Special Technology, n.d.)

2. To facilitate group interaction

Guidelines 1a-d apply here as well. Note that pre-programmed software tends to inhibit exploration of pathways and questions that deviate from what the designers anticipated (but see Snyder 1994).

a. "Take away the toys." If students remain seated in front of a computer—as is the case in computer labs—they are easily distracted from discussion and other group activities. Ways need to be found to physically separate the computer use from the group interaction.

b. Provide an explicit structure for small group interaction and peer coaching. Training may be needed. Attention to this contributes to the learning community (see objective c) under Overall Guidelines).

c. Free time for the teacher to interact during class simulations and activities, which without software to help, can involve a lot of calculating and bookkeeping on the part of the teacher.

3. To enhance communication of knowledge

Guidelines 1a-d also apply. For example, PowerPoint eliminates the time it used to take to write material on a chalkboard, but chalk or whiteboards are better for making connections during class and acknowledging students' contributions.

4. To organize a personal workstation or "virtual office"

a. Identify and address bad work habits before seeking a technical fix.

b. Assess—either in advance or after experimenting—whether a new use of technology will be sustainable.

c. Take stock of the tendency towards "continuous partial attention" (or multi-tasking), set limits, and make time for sustained, face-to-face human interactions.

d. Hold yourselves to high standards of collegiality. For example, do not use email or voicemail to communicate something you are avoiding doing face to face, or that you would not be prepared to do face to face.

Alternatives to common practices

We also need guidelines to counter certain pressures common around the use of technology in education.

5. To resist pressures to comply with expectations, standards, or expenditures that promote technology use without providing sound pedagogical guidelines.

a. Refrain from using the new equipment or facilities when there is enough work you can still do under guidelines 1-4 using older technologies.

b. Discuss with teachers the paradox in which decision-makers and vendors promote technology in education without sound, specific research on the educational benefits at the same time as they promote holding teachers and schools accountable for demonstrating the effectiveness of their teaching.

c. In discussions with colleagues and administrators, emphasize guidelines 1-3 and the distinction between "COMPUTERS in education" and "computers in EDUCATION" (see Table 1 below) and, similarly, between "the teaching of technology" and "the enhancement of teaching and learning through technology."

d. Initiate or participate in needs assessment (not simple decisions *pro* or *con*) in relation to pedagogical benefits of specific technologies.

e. Notice that technology standards for teachers may refer to higher-order thinking, and so on, but illustrations of standards center on using technology and rarely cite evaluations that show benefits for learning the subject matter, let alone higher-order thinking.

6. To not use computers to occupy some students' attention while focusing as a teacher on other students.

a. When a teacher has insufficient resources to sustain teaching/learning interaction with all the students, the first step should be to mobilize additional human resources.

b. Take into account what software is drill and practice, and which extends students' thinking.

Reflection

The second semester of my “Computers, Technology, and Education” course was more successful than the first in getting students to address these guidelines and articulate their own pedagogical rationale for using computers. This shift may have been due to the hype and attendant anxieties about the need for computers in education having quietened after the Internet dot.com bubble burst in 2000. It may have also been due to my orienting students at the outset of the course by summarizing the contrast between “COMPUTERS in education” and “computers in EDUCATION” (Table 1).

Table 1. Two contrasting emphases in using computers in teaching

	EMPHASIS ON	
	COMPUTERS in education	**computers in EDUCATION**
First...	Get technical skills	Explore pedagogical need and possibilities
Then...	Build lessons and other practices using computers	Develop technical competency when needed (using especially peer assistance)
Emphasis taught by...	People who are keen on technology—often not classroom teachers	People who love to teach students
Emphasis driven by...	Hi-tech industry, administrators, availability of funds, bandwagon, fear of being left behind	Small counter-current to the mainstream
Success is claimed when...	Technology is used and flash is added	Teaching/learning something that could not have happened without the technology
Response to the other emphasis	Students find it more fun to use technology. Technology use adds flash to lessons. There's immediate gratification for teacher in mastering a tool. Once taken up, we can build on this basis and get better in education	"Yes, you can do it with technology, but why is that worthwhile?" Usage of new tool declines after the first flush of enthusiasm/first flash. Time and support for further Professional Development is rare.
The major challenges	Use skills in actual classroom situations with equipment available	Establish plans and connections and Professional Development practices for ongoing learning
	Support those with the other emphasis	Respond to pressures from those with the other emphasis

Yet “more successful” is relative; my efforts ran against most students’ expectations for the course. According to the official description, the course would introduce students not only to educational software but also to the pedagogical issues raised by the use of computers, including possible changes in the ways that teachers teach and their students learn. However, students had been told by their Teacher Education advisors that this would be a hands-on course allowing them to get competent using a range of educational software. The available literature, syllabi, and national standards, as already mentioned, reinforced these expectations. The College appointed a tenure-track faculty member who complied with those expectations; my teaching assignments since have not included technology in education courses for teachers.

Following the burst of the dot.com bubble, discussion became more common of “pedagogy before technology” (e.g., Ascough 2002; see also Barrell 2001). “Technologically-mediated learning environments” became emphasized in an expansive view of the “learning sciences” (Sawyer 2006). The national technology education standards, especially for teachers, now highlight “student learning and creativity” over “technological literacy” (compare ISTE 2008 with ISTE 2000). Yet, given the headline publicity given to MOOCs in the last year or two and the resources given by university administrations to offer MOOCs, we may wonder whether the pendulum ever swung far from the “COMPUTERS in education” emphasis. I believe that the guidelines from 2001 remain relevant for anyone interested in critical thinking and discussion about the use and usefulness of technology, especially digital technologies, for teaching and learning. The guidelines, admittedly, assumed a face-to-face classroom setting, but, as the next section indicates, they can inform learning situations where students or participants come together across the Internet.

Collaborative Explorations for moderate-sized open online collaborative learning

Early in 2013 we (Taylor, Sullivan and Szteiter) joined two MOOCs (massive open online courses) on the topic of learning with technology, each in the connectivist or “c-MOOC” style of fostering interaction and building of online communities (Morrison 2013): the University of Edinburgh/Coursera E-learning and Digital Cultures MOOC and the MIT Media Lab/P2PU (Peer-to-Peer University) Learning Creative Learning MOOC. To the extent that our level of interest and other commitments allowed us to keep up with the assigned projects, we used—or stretched—them to explore running smaller learning communities within the crowded and sometimes disorienting spaces of c-MOOCs. Learning from failed prototypes that employed google+ hangouts (Taylor 2013a), we initiated the online "Collaborative Explorations” to be discussed in this section and have continued them almost each month since (Critical and Creative Thinking Graduate Program [CCT] 2013).

Collaborative Explorations (CEs) are an extension of Project-Based Learning (PBL) and related approaches to education that begin from a real-world scenario or case in which the problems are not well defined, which invites participants to shape their own directions of inquiry and develop their skills as investigators and teachers (in the broadest sense of the word) (Greenwald 2001). (Promotion of self-defined inquiry and exploration also characterizes certain c-MOOCs; see, e.g., Knox 2013, Cormier 2014.) The basic mode of a CE centers on interactions over a delimited period of time in small groups—online or face-to-face—in ways that create an experience of re-engagement with oneself as an avid learner and inquirer. A student in one of our graduate courses using PBL evoked this experience:

> This course is a gift—the chance to be open—open-ended in design, open to process, open to other perspectives, open to changing your ideas, and open to sharing. Of course this means it's risky too—you won't always know when you're coming from or where you are going—you might think you aren't sufficiently grounded by the course. But you have the freedom to change that—and being on the other side of it now, I see it works out beautifully. The attention to process provides you the tools to grow and by the end you're riding the wave of your earlier work... (Anon 2011)

With a view to stimulating others to participate in CEs or adapt the form to their own situation, what follows combines some descriptive information about online CEs with ideas and questions about how to make sense of what happens in them. A prospectus and links to it provide further details (CCT 2013).

Overview and position in relation to connectivist MOOCs

The *tangible* goal of any CE is to develop contributions to the topic defined by the case, which is written by the host or originator of the CE to be broad and thought provoking (Table 2). An *experiential* goal is to be impressed at how much can be learned with a small commitment of time using the CE structure to motivate and connect participants.

Table 2. Examples of CE topics

Connectivist MOOCs: Learning and collaboration, possibilities and limitations (April 2013) (Excerpt from case description http://cct.wikispaces.com/CE2): The core faculty members of [a graduate program] at... urban public university want help as they decide how to contribute to efforts at [the university] to promote open digital education... It is already clear that [their] emphasis will not be on x-MOOCs, i.e., those designed for transmission of established knowledge, but on c-MOOCs. "c" here stands for "connectivist" in recognition of the learning that takes place through horizontal connections and sharing made within communities that emerge around, but extend well beyond, the materials provided by the MOOC hosts (Morrison 2013; Taylor 2013a). What [the Program] is not so clear about yet is the kinds (plural) of learning that are happening in cMOOCs. What are their possibilities and limitations? Ditto for kinds of creativity, community, collaboration, and openness. By "limitations" [the Program] is especially interested in anticipating undesired consequences...
Young people designing their own lives (November 2013)
Policy and practices around new genetic technologies, here and there (March 2014)

The standard model for an *online* CE is to have four sessions spaced one week apart, in which the same small group interacts in real time live via the Internet for an hour. Participants, which include the host or facilitator, spend at least 90 minutes between sessions on self-directed inquiry on the case, sharing of inquiries-in-progress with their small group and the wider community for the CE, and reflecting on the process—reflection that typically involves shifts in participants' definition of what they want to find out and how. Any participants wondering how to define a meaningful and useful line of inquiry are encouraged to review the scenario for the CE, any associated materials, posts from other participants, and think about what they would like to learn more about or dig deeper into. Everyone is left, in the end, to judge for themselves whether what interests them is meaningful and useful. During the live sessions, CE participants can expect to (a) listen a lot to others, starting off in the first session with autobiographical stories that make it easier to trust and take risks with whoever has joined that CE, (b) share ideas and work-in-progress presentations about inquiries that are tentative and need clarification, and (c) write to gather their thoughts—sometimes privately, sometimes shared.

There is no assumption that participants will pursue the case beyond the limited duration of the CE. This said, the tools and processes used in CEs for inquiry, dialogue, reflection, and collaboration are designed to be readily learned by participants so they can translate them into their own settings to support the inquiries of others. To date, online CEs have used google+ communities and hangouts because the technology is simple, free, widely accessible, and unencumbered by concerns about production values and costs. Whereas a MOOC seeks to get masses of people registered, knowing that a tiny fraction will complete it, a CE focuses on establishing effective learning in small online communities then potentially scale up from there. A course is not the default teaching/learning model in CEs. Instead, they aim to address the needs of online learners who want to:

- dig deeper, make “thicker” connections with other learners
- connect topics with their own interests
- participate for shorter periods than most MOOCs
- learn without needing credits or badges for completion.

In short, online CEs are designed to provide “moocl”—*moderate-sized open online collaborative learning*.

Thickness of connections can be thought of as participants coming to see commonalities that come from multiple dimensions and interests, as opposed to relating within one category such as people doing a similar job. MOOCs usually succeed in connecting with participants from a distance, but their origins appear to lie in possibilities opened up by the technology of the internet and not in what has been learned about online learning—or learning more generally.

This said, best practices to ensure learning without computers are evident when c-MOOCs foster

horizontal connections and self-organizing learning communities (Crowley 2013, Knox 2013, Morrison 2013). Discussion is still at its early stages, however, regarding how to make MOOCs conducive of deep inquiry or thick connections and of inexperienced participants developing skills in inquiry and connecting (Milligan et al. 2013). For example, while there is active sharing of links in c-MOOCs, informative annotation of those links is less common (even though links may well be to participants' own, extended blog posts). C-MOOCs rest on the hope that individuals click on enough links to find appropriate participants with whom to interact; CEs, in contrast, provide structured processes for building connections, developing inquiry skills, and managing different scales of interaction. During live CE sessions, especially work-in-progress presentations, participants generally provide thoughtful reflections and syntheses. In short, the use of the Internet for CEs is consonant with many of the principles of online education from the first section of the article (Table 3).

Table 3. Selected principles of online education as implemented in Collaborative Explorations

Principle of online education	**Implementation in CEs**
1a. Use computers first and foremost to teach or learn things that are difficult to teach or learn with pedagogical approaches that are not based on computers.	Bring in participants from a distance. Make rapid connections with informants or discussants outside the CE. Contribute to evolving guides to materials and resources.
1b. Make sure that learning or knowledge-construction is happening.	Each live session ends with writing to gather thoughts and sharing of one item to "chew on." Work-in-progress presentations* (5-7 minutes) in session 3 require participants to focus their inquiries and organize the results to date.
1c. Model computer use on best practices for teaching/learning without computers.	Participants become self-directed and collaborative learners—gaining tools, ideas, and support from other participants who they can trust; integrating what they learn with their own personal, pedagogical, and professional development.
2a. "Take away the toys" and 2b. Provide an explicit structure for small group interaction and peer coaching.	Live sessions start with freewriting* to prepare one's thoughts and emphasize listening (with chat box in live hangout used only for turn-taking, not for side conversations). Participation in google+ community guided by the following tip: "*Set limits and give yourself a structure* so involvement in the community does not lead you to feel swamped or fragmented or unsure that you can synthesize or keep in mind all the interesting items you are coming across. To this end, you might allow yourself a *delimited amount of time* per day… to explore online offerings or sharings but you would also preserve an *equal amount of time*… to *gather your thoughts* based on whatever is currently in view or in mind, which may be quite different from what you have to do for your work or project or studies…"

* Source for these and various other processes of "research and engagement": Taylor and Szteiter (2012)

Ideas and questions about how to make sense of what happens in CEs

> I've changed. I've changed on all levels. On a political level. Work level. Personal level. Professional level. And it has been a positive change... I have an infrastructure in my brain, so I know what I am doing now when I am with people, when I work in groups. (A new CE participant's reflection at the end of her first CE, December 2013)

Of course, it takes more than a single appreciative quote to demonstrate the effectiveness and impact of CEs. Let us, however, deflect the demand for data and evaluation by positioning our research on CEs in the exploratory phase (Wikipedia n.d.). The guiding question at this stage is to develop vocabulary and themes relevant to examining the effect for learners of a MOOC model that does not involve large centralized providers. Let us convey provisional vocabulary and themes from our conversations and reflections before addressing, in the next sub-section, the challenges ahead, including that of more systematic, albeit still exploratory, research.

CEs and PBL aim for participants' re-engaging with themselves as avid learners and inquirers. This is made possible by the combination, shown in Figure 1, of:

- the tools and processes used for inquiry, dialogue, reflection, and collaboration;
- the connections made among the diverse participants who bring diverse interests, skills, knowledge, experience, and aspirations to the CE/PBL case; and
- the participants' contributions to the topics laid out in the scenarios from which each CE/PBL case begins.

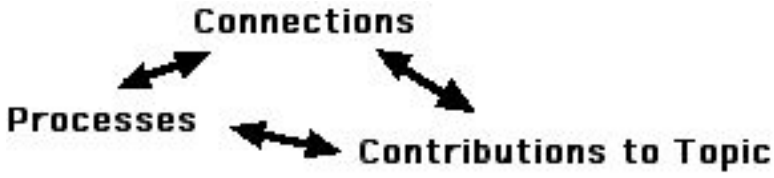

Figure 1. Triad of aspects of a CE or PBL

The re-engagement, in turn, makes it more likely—or, at least, so is the hope—that participants carry this triad over into subsequent changes in:

- their own inquiries and teaching-learning interactions for life-long learning;
- the ways that they support inquiries of others;
- other practices of critical intellectual exchange and cooperation; and
- challenging the barriers to learning often associated with expertise, location, time, gender, race, class, or age.

In thinking about how CEs can provide opportunities for participants to re-engage with themselves as avid learners and inquirers, inspiration has been drawn from a number of sources:

- *Students in science-in-society graduate courses that use PBL*: "This course provides a structure for me to learn about what really interests me" (pers. comm. 2009; see also Anon 2011.)
- *The "4Rs" framework* based on the experience of the New England Workshop on Science and Social Change: Build *Respect* for each others' diversity and our own diverse strands, which make it more likely for little *Risks* in which participants in the activities stretch beyond the customary and for little *Revelations* to affirm these Risks. The steady experience of these Revelations or insights leads to *Re-engagement* in the realms of our customary work (Taylor 2012, p. 251ff).
- *Vivian Paley's writing about play, story-telling, and kindness among young school-children*: In *The Girl with the Brown Crayon* (p. 47), Paley says to her assistant Nisha: "Isn't it a great feeling tying together all these stories?" Nisha: "Yes, but it doesn't feel as if I'm tying things up. No, it's more like opening up, or maybe even discovering things I've forgotten." In *The Boy on the Beach* (p. 24), Paley writes, paraphrasing a 1924 essay by V. Woolf: "[T]he teacher must get in touch with the children by putting before them something they recognize, which therefore stimulates their imaginations and makes them willing to cooperate in the business of intimacy." (To translate this into CEs: replace "children" by "participants" and read "intimacy" as exposing vulnerabilities, aspirations, unformed ideas to each other.) In the same book, a colleague writing to Paley remarks (p. 25): "When [children] solve one problem, they create another to act on. By proving they are necessary and useful in a story, they demonstrate that they have a reason to exist, to be here with others."
- *Michael White's narrative practice in family therapy and community work*: "It is one thing to know that people are not passive recipients of life forces. But it is another thing to identify [people's multiplicity of] initiatives, and to contribute to a context that is favorable to their endurance…. [I]t is another thing to identify initiatives that might provide a point of entry to the sort of rich story development that brings with it more positive identity conclusions and new options for action in the world" (White 2011, p. 29).
- *Taylor and Szteiter's Taking Yourself Seriously*—"a fieldbook of tools and processes to help readers in all fields develop as researchers, writers, and agents of change."

In short, our sources concern what we might call social competencies, more than digital.

Possible extensions

CCT (2013) lists many possible extensions of CEs, from forming a group that pursues the case beyond the limited duration of the CE, through accommodating participants that have different levels of preparation in the topics or in the processes of interaction, to undertaking exploratory research on CEs.

On this last item, the obvious next steps would be to secure informed consent of a representative sample of CE participants, use a standard protocol to conduct short interviews about interviewees' experience in CEs and their experience, if any, in a recent MOOC, and undertake qualitative analysis of interview transcripts to identify vocabulary and themes that flesh out or complicate from the provisional terms and themes above.

We submitted a proposal to undertake just such exploratory research to the MOOC Research Initiative (MRI) in 2013. MRI, formed to address the gap in research "evaluating MOOCs and how they impact teaching, learning, and education in general" (MRI 2013), had called for submissions that addressed, among other questions:

- "What models of MOOCs exist beyond large centralized providers?"
- "What institutional, pedagogical, learning design, technological, and business models are currently employed and which have the most potential to have a positive effect for our learner population?"

The reviewers were reasonably justified in noting that our proposal was not based on the existing MOOC research literature. We had hoped, given the professed interest of MRI in *alternatives* to the dominant models and in designs for learning, that CEs would nevertheless intrigue reviewers, but our explicitly exploratory proposal was not included in the mix selected to move to the next round of review. Later, when we examined the funded projects that were concerned with interactions conducive of learning, we noted that the proposals took the massive in MOOCs as given. This meant that the analyses could be quantitative, using, for example, social network analysis to map peer-to-peer interactivity. Our approach was, in contrast, to start small, "scaling up to 'moocl,' not dropping down from a MOOC," as the proposal title indicated (Taylor et al. 2013). The research currents into which our approach might flow is more qualitative, focusing on identifying and cultivating qualities that enable MOOC and open online learning participants to connect and build interactions with others (Milligan et al. 2013).

We have continued to address the challenge of drawing in more participants, in part so that CEs might be scaled up to multiple learning communities around any given case, but also to have enough participants for a meaningful sample to be interviewed for research (at some time when we can secure the necessary time and resources). We have encountered two conundrums related to this challenge. Both follow from the c-MOOCs that we have been participating in being an obvious medium in which to publicize CEs. When our posts on course issues mention CEs and their rationale, those taking note have tended to be active c-MOOC participants. When these people register to join a CE, other matters, including their active asynchronous exchanges, often get in the way of following through with the live sessions and having the full experience of a month-long learning experience. The first conundrum then is the difficulty in using asynchronous exchanges to wean others away from active asynchronous exchanges that might seem not to be very deep or substantial. Reciprocally, the time we might spend cultivating or deepening a new

connection that emerged from such an exchange is time not available for participation in the wider c-MOOC communities.

A way out of this conundrum would be to forge a partnership with organizers of a c-MOOC so that CEs get built into the connecting, as against the didactic, side of the design of their MOOCs. Giving CEs a central role in the MOOC would increase the numbers of participants who gave themselves a chance to experience CEs, which would surely be more persuasive—and generative of responses to be studied—than our prospectus or any other writing about the CEs. Without going into the ups and downs of our partnership-seeking efforts, we have been finding that MOOC designers focus on putting technologies in place within which participant-initiated interactions may then happen—or not. Of course, without people dedicated to making the technical arrangements, there would not be suitable c-MOOCs in which to participate and with which we might seek to partner. The second conundrum, then, is that we are running both *with* and *against* the direction of MOOC development, which, to use the terms of Table 1, starts from COMPUTERS in education even as it begins to move towards—or rediscover the need for— computers in EDUCATION.

It remains to be seen whether we can overcome the two conundrums and, eventually, complete research that affirms the potential we see for CEs to have a positive effect on the MOOC or open, online learner population.

Reflection

With Apple, Microsoft, IBM, and Google regularly in the top ten corporations worldwide in terms of market capitalization, no one should be surprised to find the education sector a place where computers and digital technologies get promoted. However, to note this is to open up issues about the wider context in which U.S. education is embedded. The political, economic and cultural dynamics in which we have to operate are apparent when we look at discussion of public education, which is said to be failing for reasons such as the following (with corresponding corporate interests pointed to in parentheses):

- Students are not held to acceptable standards. (The solution involves textbooks and tests that happen to be produced by large publishing companies with political connections; Metcalf 2002.)
- Schools kill creativity, as Ken Robinson has told 25 million visitors to one of his TED videos. (TED, with its origins in Silicon Valley continues to inform and entertain viewers with a vision of accelerating technological change.)
- Public schools and teachers unions resist change, so school funds need to be diverted to subsidize charter schools usually freed from serving the full range of children. (Charter schools are which are promoted and further subsidized by foundations that also promote technological responses to social problems, such as the Broad and the Gates Foundations.)

- Science teachers need to know more science to teach well. (This view underpins funding available from the National Science Foundation for scientist involvement in educational improvement, but see Bower 2005 for a scientist's critical assessment of his initial assumptions.)
- And so on. Against the backdrop of the intertwined and powerful social dynamics implied in these quick example, the two initiatives we have introduced in this article cannot expect to achieve Fløistad's "real renewal." They can, however, be read, as Hallnäs and Redström
- suggest, as invitations to innovators in e-education to build reflection into their design work so as to open up "time presence" for "slowness, reflection and togetherness."

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