An ever-growing selection of emerging technologies and practices is having a profound impact on learning. Social technologies and online environments that reconfigure education challenge traditional education structures. In online social environments, individuals can switch seamlessly between the roles of expert, amateur, audience, author, learner, and educator. As we examine our learners’ world outside of their formal learning environments, we see that Web 2.0 has redefined how information is created and shared, potentially enabling broad societal transformations. We must question whether informal learning has changed things so profoundly that traditional approaches to education are becoming irrelevant. Can educators embrace a multiplicity of roles and, with our learners and the general public, recognize and participate in dynamically and collaboratively constructed formal and informal personalized learning environments?

IMAGINE THE EXPERT AND THE AMATEUR

In the not-too-distant past, if we needed to learn something, we would almost certainly interact with an expert, either directly with an instructor or indirectly through some form of media (such as text documents, documentaries, photos, museum exhibits). In any of those scenarios, the source of information was
filtered before it reached the learners (our teachers had to have received a set of credentials, the newspaper or book would have been edited by someone with recognized expertise). Shirky (2008) refers to this idea as the “filter then publish” model. If we eventually acquired enough information and received the appropriate degrees, we were then deemed as recognized experts ourselves, ready to be sought out by others.

This traditional role of expertise is being challenged today, with a broad range of individuals immersed as contributors and consumers of collaborative sources of information: blogs, wikis, social networks, video sharing sites, and citizen journalism websites. In this context, is it possible to ever acquire “enough” information? Which sources are to be trusted?

Unlike traditional information sources, the supply of contemporary online information has not been vetted in any conventional sense of the word. Perhaps because of this, the extent of new information constantly becoming available is unprecedented. As Johnson, Adams, Becker, Estrada, and Freeman (2014, p. 8), note: “Today’s web users are prolific creators of content, and they upload photographs, audio, and video to the cloud by the billions. Producing, commenting, and classifying these media have become just as important as the more passive tasks of searching, reading, watching, and listening.” For example, during a random five-day period in July 2014, Wikipedia added almost 5,000 articles, 34,000 pages, and 700,000 edits (“Wikipedia: About,” 2014) and in January 2014, Facebook reported over 1 billion active users per month and most of them mobile users. As of July 2014, Twitter sees 58 million tweets a day (Statistic Brain, 2014) and YouTube reports that 100 hours of video are uploaded to the site every minute (YouTube, n.d.).

Given this influx of information created and disseminated by non-experts, is the concept of expertise changing, or vanishing entirely? Lin and Ranjit (2012) believe, “Knowledge creation and scholarly communication are moving away from the situation in which a few experts generate content to transmit to a set of users. Now there are various routes via a wide range of collaborative tools for research and content dissemination” (Lin & Ranjit, 2012, p. 2). Individuals without formal qualifications can contribute to the online information environment as easily as those who are recognized as experts. There is no guarantee, however, that when searching the Web we will find information that has authoritative weight. Is this a problem for us as educators or for education in general? If so, when is it a problem and when does it become a problem? What, if anything, should be done to address it?
In part, the changing role of expertise reflects the departure from another feature of the not-too-distant past: that it was often difficult to acquire proficiency in areas outside of one’s own field, because the information was not available. Hobbies were possible, but in-depth niche learning was only for the individual who had enough time and/or money to fully pursue an area of interest. Additionally, geographic, occupational, and socioeconomic boundaries meant that a person might be isolated from any community that could support his or her growth. Today, a “passionate amateur” (Leadbeater, 2005) can easily engage with hobbies, interests, and academic and leisure pursuits in a way that is far beyond “dabbling,” because information is widely and cheaply accessible, and the participatory nature of the web means that a two-way information flow is available to all. Both amateurs and experts, and all those in between, can access information, collaborate, and network online with others who share similar interests/passions. Learning can be reciprocal, with experts learning from and building upon the ideas generated by non-experts. Examples are plentiful, from the parent who put his child’s medical records online to connect with researchers who might be able to work with him to help solve the puzzle of brain injury (Celizic, 2008), to stories of citizen journalism exposing events that would have been otherwise hidden, to the point where law enforcers, politicians, and others can never assume that anything is “off the record” (Slocum, 2008). Amateurs are contributing in ways that were impossible a few years ago. Shirky (2008) uses Linux—an open-source software based on suggestions solicited through an early bulletin-board style discussion forum demonstrating the potential for enormous success through the “global talent pool.” If participation is cheap, even for amateurs, then it is easy to experiment with a multitude of ideas. A small but dedicated group of people can easily find each other and cooperate on projects of common interest. From profound projects, such as the work done through MIT’s Center for Collective Intelligence (http://cci.mit.edu) to the more homespun and personal, such as the over 4 million knitters who connect via Ravelry (the fiber arts online community), ideas and information are being shared online like never before.

Even when experts collaborate they can now post their thinking and invite comments and contributions (Veletsianos, 2013). In particular, “social media has changed the nature of these important conversations so that they are not always behind doors, but instead viewed as an opportunity for substantial collective thinking and action” (Johnson, Adams Becker, Estrada, & Freeman, 2014, p. 9). For example, a University of Hawaii initiative aimed at encouraging faculty to
re-envision the future of the higher education teaching profession (with social media as a major component) involved the broadcast of face-to-face sessions on YouTube so that anyone could participate in real-time discussions, which were encouraged and tracked with a unique hashtag on Twitter.

**IMAGINE THE AUDIENCE AND THE AUTHORS**

Prior to the participatory web, there was a clear distinction between an audience and a recognized author. The author was the rare individual who had enough information or talent to make it worthwhile financially to create an expensive publication; the audience was the rest of us who received that publication (or film, play, etc.). Authors who were rejected by traditional publishing houses could self-publish but this was an expensive proposition. Today, a writer can self-publish an e-book or buy specific services from companies who assist self-publishers. There are even companies that “print on demand” where printing occurs at the time of purchase (Finder, 2012) and self-publishing has been experiencing astronomical growth (see Flood, 2014).

This development is reflected by the characterization of Web 2.0 as the “read-write web” (O’Hear, 2006), as the participatory capabilities of the most recent Internet tools such as wikis or blogs allow content to be contributed and viewed by anyone who has web access. This means that small bits of information, generated by huge numbers of individuals, can be published to form vast information sources (e.g., Wikipedia). Shirky (2008) poses the vision of a world where large numbers of people contribute massive amounts of knowledge to online collaborative projects (such as Wikimedia projects), even when their contribution takes up only small portions of their time, drawn from what he calls the cognitive surplus (for instance, time that may have previously been spent watching television commercials). Large amounts of information are already abundant and freely accessible. If we are not able to find information we are searching for, we can request it (e.g., in a blog or micro-blogging platform) and it will be generated by our network. We can share our interpretations, comment, question, and critique information in a public sphere to generate further conversations. Wikipedia is a clear example of how the author and the audience are one and the same, since everyone who reads Wikipedia articles is also provided with the ability to edit and write them, as well as make comments and engage in discussion with other participants.

The ability to both generate and access information is facilitated by certain features of new, widely used technologies. Our mobile phones are Internet
browsers, our computers are telephones, our tablets are both; we can send pictures and video clips instantaneously with the prospect of being viewed by millions, and we are easily able to listen to more voices than we’ve ever heard before. At our fingertips, at all times, the potential exists to be audience and author. It is therefore easy to become enthused if we know that it is simple to contribute, and that our small contributions can potentially be valuable. There is an increasing recognition of this and even in a formal educational context, “institutional leaders are increasingly seeing their students as creators rather than consumers” (Johnson et al., 2014, p. 7).

IMAGINE THE LEARNER AND THE EDUCATOR

Like expert/amateur and audience/author, the roles of learner and educator are increasingly becoming intermingled in the participatory web. Teachers have typically felt the pressure to keep up-to-date in their field, but it is a profound change that both the learner and the teacher have identical access to the same vast set of resources. Students are spending more time on the Internet than in the classroom as they increasingly look to it for information and news (Johnson et al., 2014, p. 32). Even more of a dilemma is the possibility that the learner may have a potential advantage by being more familiar with digital skills acquired through online participation (such as image manipulation, keyword refinement, etc.).

Such digital literacy can also lead learners to engage with information in new ways. Downes (2008) discusses how web technologies have fostered a more informal type of learning “based on a student’s individual needs, rather than as predefined in a formal class, and based on a student’s schedule, rather than that set by the institution.” He goes on to describe how such informal learning involves “no boundaries; people drift into and out of the conversation as their knowledge and interests change” (Downes, 2008), and this concept has been integrated into the learning design he favours for massive open online courses (MOOCs), wherein learners participate in connectivist-oriented MOOCs (see chapters 2 and 9) in a similar fashion, drifting in and out as needed.

The counterpoint, showing learners’ views of the traditional four-walled classroom, appears in a much-circulated YouTube video, “A Vision of Students Today” (Wesch, 2008b). Specifically the video explored how the structured environment does not connect with the learners’ desire for informal learning and how the concept of categorized information does not fit with students’ ways of freely accessing what they need to know. These learners explicitly state that they hate school but love learning. These learners want their education
to be more relevant to life, just as they would access social networking sites in class rather than read textbooks or assigned readings. These learners do not see how multiple-choice questions will help them solve complex societal problems or allow them to succeed in a job that doesn’t even exist yet; in the words of Perelman (1993), “school plods where human imagination naturally leaps” (p. 142).

Emerging approaches to education that are sometimes informed by such attitudes, such as MOOCs and competency-based models, are attracting a lot of attention—both positive and negative. What are the roles of teacher and student in a course with 30,000 students enrolled? What are the roles in self-paced courses with no instructor? Can MOOCs offer an effective way to move from formal education to personal learning (chapters 8 and 9)? Alternative assessment methods are being explored in an effort to recognize informal learning through badges and other micro-credentials.

Outside the realm of MOOCs, as today’s methods of learning frequently use technology in either distance learning approaches or blended learning, educators are increasingly part of digital learning environments. Like almost all contemporary educators, we have arrived here through a system that embraced neither the notions of informal learning nor of the expert, amateur, audience, and author in the relationships described above. For instance, Liston, Whitcomb, and Borko (2009), among others, note that there is still a reliance on the transmission model of instruction wherever standardized testing is emphasized and this is detrimental to the personal development of students. We have, however, likely used some technology, and perhaps even created online resources through a learning management system (LMS). Are we confident that we are on the right path, or are we apprehensive?

One of the forms this apprehensiveness might take relates to concerns that the breadth and immediacy of informational access that new technologies facilitate could replace depth and analysis. A new responsibility seems to be upon us: to ensure that our learners have the opportunity to develop skills and literacies that are appropriate for deep learning from (or in spite of) the published but unfiltered information they are currently encountering.

THE PARTICIPATORY WEB AND OUR ROLES IN IT

From its early beginnings, the participatory web elicited diverse views with respect to education and learning. In this section we review the intriguing viewpoints of some authors that are relevant to learner and instructor roles.
Some critics:

Keen’s (2007) *The Cult of the Amateur: How Today’s Internet Is Killing Our Culture* expressed his concern regarding the watering-down of the concept of expertise and what he saw as the flood of misinformation. His more recent book, *Digital Vertigo* (2010), focuses on his view of social media as a threat to individual liberty; he speaks of collective self-destruction if we don’t make the right choices.

Carr (2008) asked: “Is Google making us stupid?” He argued that hyperlinked reading on the Web was making us unable to focus on lengthier ideas, such as those in books. He now writes in terms of a larger “intellectual ethic” where technology is discouraging depth and encouraging skimming, thus optimizing us with respect to production and consumption but depriving us of the ability to reflect, concentrate, and contemplate.

Rosen (2013) asks “Are smartphones turning us into bad Samaritans?” and cites examples of tragedies (such as a subway shooting death) that many believe could have been averted if onlookers hadn’t been engaged in cell phone use. In her 2008 book she described her concerns regarding multitasking causing neurological changes and loss of productivity.

Some enthusiasts include:

Clay Shirky, whose 2008 book *Here Comes Everybody* discussed how Web 2.0 allowed us to contribute collectively for the improvement of all by better using our cognitive surplus, published *Cognitive Surplus: Creativity and Generosity in a Connected Age* in 2010 which expanded on the idea of encouraging group work and experimentation in the various types of new social networks. In a recent blog post Shirky (2014) addressed the end of education’s “golden era” not because of emerging technologies but because the post-secondary system is “trying to preserve a set of practices that have outlived the economics that made them possible.” Shirky bets on emerging practices such as “the spread of large-scale, low-cost education” delivered via technology to meet “the massive demand for education, which our existing institutions are increasingly unable to handle.”
John Seely Brown and Richard Adler, whose 2008 article “Minds on fire: Open education, the long tail, and learning 2.0” argued that understanding is socially constructed and that meaning is created through remixing and building on the work of others, both of which are supported by participatory emerging technologies.

Adler (2013) stated that 80 percent of learning takes place outside of school and that dynamic learning happens when the core (institutional content) meets the edge (informal content).

In looking at more recent work, we see that many of the same issues are still raised. Perhaps the critics have become more reconciled to the persistence of new networks and perhaps the proponents speak more about the potential for misuse. If we accept that there is some validity in parts of all the points of view, we should continue to explore the ways in which educators can work with (rather than fight against) what learners bring to educational pursuits so that their formal learning experiences afford them with an improved ability to evaluate and contribute at a more meaningful level. The challenges were and perhaps still are:

- How to find ways to embed or scaffold critical thinking through the use of technology in general, and emerging technologies in particular;
- How to respond to the changing higher education landscape created by emerging technologies and practices;
- How to best assist learners to be effective participants in the participatory society and to add value to the world they are living in; and
- How to advance distance education (while recognizing that distance is less and less a barrier with respect to learning) and enhance practice.

To successfully meet these challenges requires an understanding of the changing dynamics of learning. Shirky (2008b) stated “the physics of participation is more like weather than gravity. All the forces combine.” This evokes images of chaos: powerful but complicated patterns with unpredictable global consequences, compared to what he seems to see as our previous, oversimplified “what goes up must come down” way of looking at the world. Five years later, Shirky (2014) viewed the chaos that led to the initial failure of the U.S. government’s healthcare website in 2013 and expressed his view that to create any
large-scale environment requires that developers learn from their users and learn from experience. The “waterfall” model (having an unchangeable plan in place at the onset of a project) does not work in this world of online complexity. Applied to digital education, if even a small part of what Shirky (2014) interprets about change is true then it seems clear that teaching and learning must also be in transition. Wesch (2008b) goes as far as to say that his every assumption about information and learning was shattered because of 2.0. Shattered is a very strong word, but, as distance educators, can we see any shattered pieces and find delight that some of our constraints have been lifted so we can refocus, rebuild, and reinvent?

An excellent place from which to start thinking about reinventing ourselves within the distance education context is the Wesch (2008b) lecture at the University of Manitoba, “A Portal to Media Literacy.” Wesch speaks in a lecture hall and bases his discussion of traditional education on that physical environment. He describes the hall as a place designed to fit a model of learning that incorporates the following beliefs:

To learn is to acquire information.

Information is scarce (so a place must be created where an expert can convey information to a large group).

The authority of the expert must be followed (that is why the expert is at the front of the room with everyone else facing him/her).

Authorized information is beyond discussion (so the chairs are in fixed positions and learners don’t turn to talk to each other).

Wesch then describes his findings that learners no longer believe in the above assumptions. He concludes that there is a serious crisis of significance. His answer is to encourage learners to work on collaborative projects, and to use media tools for the making of meaningful connections with personal relevance. Wesch has gone further with this idea, referring to learning as “soul-making” and speaking of the need for “genuine connections” to “restore the sense of joy and curiosity that we hope to instill in our students” (Wesch, 2014a). It seems inevitable from this perspective that assessment should be based on a view of whether and how learners have made those personally relevant connections rather than on the recitation of factual information (Wesch, 2014b).
The question then becomes, are we fully exploring the affordances of the web with appropriate pedagogies and ways of thinking about education and learning in investigating and embracing emerging models of distance education? Media literacy is an important key to effective education in a participatory learning environment. Wesch states, “There are no natives” (2008a). Given that the online environment is largely new to both educators and learners (and that it is changing constantly), we must not assume students are media literate (Wesch, 2008a). As an example, Wesch mentions that a large proportion of his students did not know that Wikipedia was editable and many had never edited a wiki of any sort. And since new tools are appearing nearly every day, media literacy strategies are more important than specific details about specific platforms.

Other authors agree: Alexander (2008) argues that those involved in higher education must rethink the definition of literacy: “if we want our students to engage the world as critical, informed people, then we need to reshape our plans as that world changes” (p. 200). Wesch (2009) speaks of critical analysis and metacognition and of ways in which he engages students to create notes collaboratively, all related to his view that it is important to prepare students to create content in and for a world that is both “download and upload.” Based on what his students are telling him, he believes that discussion (in our view, critical discussion or true dialogue) rather than information transmission, is a key factor for engagement, and states that “the focus is not on providing answers to be memorized, but on creating a learning environment more conducive to producing the types of questions that ask students to challenge their taken-for-granted assumptions and see their own underlying biases” (Wesch, 2009).

How does critical discussion of engaged learning affect ideas and questions about distance education? The early history of distance education was often a story of isolation (Sherry, 1996). Many who lived in areas too remote for schools to be accessible, were too ill, or could not afford to attend regular classes could learn alone, with workbooks and assignments exchanged through postal mail. An occasional telephone conversation with an instructor might have been included, but solitary learning was a fundamental and central feature of the early “correspondence” model. It seemed that the correspondence model was accepted as satisfactory and generally seen as second best when compared to face-to-face learning. For instance, Garrison (1990) asserted that without connectivity, distance learning “degenerates” into the correspondence-course model of independent study. The earliest distance education technologies were unidirectional and asynchronous (e.g., radio and broadcast television) and did
not incorporate interaction. When technologies able to diminish isolation and provide interaction opportunities became available, distance education entered an era of transformation.

Distance education may be well positioned to be at the forefront of innovative ways to rethink education, simply because there is little nostalgia for the early ways of teaching, studying, and learning in isolation. Having few compelling reasons to hold on to old methods means that an opportunity exists to envision new solutions for current and future challenges. With respect to education, distance and non-distance learning lines are blurring. The traditional brick and mortar classroom now incorporates digital resources and people who are not physically present. Distance learners now find it easy to have a range of people around them virtually. The distinctions between physical and virtual are likely to become blurrier as wearable technologies and augmented reality applications become increasingly common.

In this exciting online environment, there are numerous ways to achieve a learning outcome. Those distance educators familiar with a learning management system (LMS) such as Moodle or Blackboard have incorporated discussion forums and collaborative assignments into their courses and many believe that such environments are better than correspondence courses, and not as limiting as a lecture hall. Many of us are looking for ways to capitalize on this, to exploit the potential of the LMS technology even further, hoping to transcend the structure of a platform. Learning could take place through more open social media while retaining the administrative benefits of a learning platform. Key questions we should continue to ask about these learning environments include:

- Does our curriculum allow for using emerging technologies to engage learners? Are we engaging learners by ensuring their learning is personally relevant? If not, could experiences like blogging or building a wiki for a real audience help?

- Do we assess on the basis of meaningful connections?

By the end of their distance education experience, will learners internalize and exhibit an enhanced ability to contribute to what John Seely Brown (2008) would call an “open-source culture,” and create more of what Putnam (2000) would refer to as “social capital?” Are we introducing our students to emerging practices?
WHAT ABOUT THE RISKS SUGGESTED BY THE CRITICS?

Shirky (2008c) counters Carr’s (2008) argument that we are not reading as deeply in the era of abundance by declaring, “every past technology I know of that has increased the number of producers and consumers of written material, from the alphabet and papyrus to the telegraph and the paperback, has been good for humanity.” Although emerging technologies provide increased opportunities to solve problems, Keen (2007) worries we will falter by having too much freedom and too much access to information not created by recognized experts. Shirky agrees that Keen (2007) poses a hard question that must be answered and Carvin (2008) asks educators to avoid the “wide-eyed cheerleader” point of view and recognize the challenges.

Part of the solution may come from the emerging technologies themselves, and the emerging practices that they make available. In the near future, there may well be technologies that evolve to provide authority to certain information. For example, Internet founding father Tim Berners-Lee (2008, interviewed by Ghosh) is working on a project to provide scientific websites with reliability ratings, something he sees as being crucial for particular types of content (e.g., medical information/advice). But in general, as Keohane (2008) notes about Wikipedia, and by association Web 2.0, user-generated content is largely self-correcting.

What is required are ways to ensure that user self-correction is ongoing and that users keep track of where any particular piece of information might be in that self-correction process (the first iteration of a Wikipedia article may be suspect; after a thousand edits, it may well be a highly reliable source). In many ways this reflects what critics have always been calling for: critical thinking and a type of virtual “street smartness.” Without that awareness, the perils are indeed real. With awareness, the potential, in the view of all but the harshest critics, is truly amazing. Can we move forward, with a spirit of adventure, applying our imagination and inventiveness to authentic questions?

The importance of authenticity in learning has long been discussed in K–12 education (e.g., Brown, Collins, & Duguid, 1989). Instead of merely studying history, learners should become historians, emulating the research techniques used by experts and even examining original sources that would not have been available before but are now online. Learners should learn science by doing science, and so on. We believe that authentic learning is increasingly made possible by the participatory nature of emerging technologies. If, as critics suggest, the inability to filter is one of the greatest arguments against

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a participatory web (thus staying with the model of “experts only” as content providers), then authentic learning provides a strong counterargument. When a consumer knows what’s involved in creation, and is, in fact, a creator able to use the same techniques that experts use, there is a much smaller possibility that he or she will be misled. Authentic learning requires critical thinking based on experience.

CONCLUSION

As distance educators we can take on multiple roles through the participatory web. Our learners, and the general public, can also take on multiple roles. At their best, emerging technologies and associated practices serve to easily and democratically connect people who may have previously had little or no opportunity to connect with each other. Such connections can foster new roles for learning, teaching, knowledge creation, and knowledge consumption. Perhaps emerging technologies will enable us to reinvent our learning environments so that they are dynamically constructed in cooperation with our learners and the general public. Perhaps future learning environments can be engaging and collaborative places of ongoing formal and informal personalized learning. We may have exciting and fulfilling times ahead of us if we can adjust our mindsets and participate.

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