

# Participatory Transformations

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Learning, in its many forms, from the classroom to independent study, is being transformed by new practices emerging around Internet use. Conversation, participation and community have become watchwords for the processes of learning promised by the Internet and accomplished via technologies such as bulletin boards, wikis, blogs, social software and shared internet-based repositories, devices such as laptops, PDAs, cell phones and digital cameras, and infrastructures of internet connection, telephone, wireless and broadband. Early discussion of the Internet extolled its transformative potential for democracy, perhaps best demonstrated by the US presidential nomination campaign around Howard Dean in 2000, and contemporary political blogging. This kind of inclusive, participatory action has now spread to many other aspects of daily life, demonstrated in: listservs and discussion groups; recommender systems (Resnick & Varian, 1997); cooperative classification systems (folksonomies; Mathes, 2004); collaboratively built, wiki-based encyclopedias (Wikipedia), dictionaries (Wiktionary), and local resources; and citizen journalism in blogs and photoblogs. These emergent, participatory trends are often brought together under research and ideas about social software, collective intelligence, distributed cognition, and collaboration. They are also brought together in the commercial sector under the label Web 2.0 (O'Reilly, 2005), in the economic sphere under discussion of peer production (Benkler, 2002, 2004, 2005), and most recently in education under the idea of participatory culture (Jenkins, 2006).

In education – in learning and teaching – participatory trends harbinge a radical transformation in who learns from whom, where, under what circumstances, and for what and whose purpose. They bring changes in where we find information, who we learn from, how learning progresses, and how we contribute to our learning and the learning of others. These transformations are captured in ideas such as computer-supported collaborative learning (CSCL; Koschmann, 1996), community-embedded learners (Kazmer, 2007), braided learning (Preston, in press; C. Jenkins, 2004), online learning communities (Jorbring & Saljo, in press), and where terms such as ‘e-learning’ and ‘networked learning’ signify a transformation in learning rather than a transition from off- to on-line (Andrews & Haythornthwaite, 2007; Steeples & Jones, 2002). In their impact on learning inside and outside classroom, these trends indicate a transformation to *ubiquitous learning* – a continuous anytime, anywhere, anyone contribution and retrieval of learning materials and advice on and through the Internet and its technologies, communities, niches and social spaces.

While there are great benefits to be obtained from online action and interaction, it is also important to consider what is being overlooked in this process as these unexpected outcomes may become barriers to successful learning experiences. Many transformations act at the periphery of the general movement to ubiquitous learning. Trends that accompany distributed

practices include outsourcing, offshoring, disintermediation, networked individualism (Wellman, 2001), and the downstreaming of processes and responsibilities to individuals. The autonomous learner becomes responsible for, and is often alone in creating their own learning context and content as they search the internet for materials to support their needs. Although writers such as Jenkins extol the virtues of students learning to engage in “collective intelligence” in a “community that knows everything and individuals who know how to tap the community to acquire knowledge on a just-in-time basis” (p. 42), such an ideal can overstate the knowledge that may be present in such communities, the imbalance in who does the work and who benefits, and the actualities of altruistic contribution necessary to maintain critical mass and to sustain working knowledge communities. It understates the work needed to sustain useful and usable resources, and ignores the efforts and techniques embodied in certain roles and practices, now swept away as every individual is his or her own teacher, journalist, librarian, writer, and publisher.

There are two sides to participatory transformations that need attention: retrieval and contribution. On the *retrieval* side, there are issues of user responsibilities for critical evaluation of retrieved information, online authors, online sites, and search engine algorithms. While passing reference is made to the use of traditional information gatekeepers – professional editors and librarians – little is mentioned of the work that devolves to the user when such gatekeepers are absent. Without these roles, individuals are left vetting sources, sorting fact from fiction, and distinguishing commentary from original data. These are skills that can be addressed through education in critical media literacy for those still in the education system, but it is unclear how the ubiquitous learner outside this system will gain such skills. While academics lament students’ reluctance to examine print resources, how many among us turn around to pull a dictionary from the shelf when our hands are on the keyboard? The Pew Internet project (Horrigan, 2006) reports that convenience heavily outweighs accuracy as a reason for using the internet for obtaining information. Specifically for science information, they report that 71% of the adult population surveyed turn to the Internet because of its convenience, and only 13% because they feel it is more accurate (another 12% feel the information they want is only available online). The report also confirms that the work of verifying resources has fallen to the user; 80% of these adults do some sort of “fact-checking” of this science information. They check at least another online source (62%), an offline source (54%), or the original report (54%).

Another retrieval literacy issue exists in our routes to information. Figures indicate that one search engine – Google – dominates as our retrieval mechanism for information on the web. While we encourage critical attention the information retrieved, we give over our source selection to one and at most two hidden algorithms owned by search engine companies. In July 2007, Google was used for 50-65% of all searches in the US, followed by Yahoo (20-27%), MSN (8-10%), and Ask (3-5%)(sources are comSource, and Hitwise, as cited on the ClickZ site, Burn, 2007). In February 2007, Google dominated globally as the search engine most used (77%; source is Hitwise as cited on the ClickZ site; Jarboe, 2007). While Nielsen ratings also notes that users are expanding beyond a single search engine, with about two-thirds using at least two search engines (Jarboe, 2007), how many of us choose to search for a particular item using more than one search engine? What are we missing by searching using only one or two algorithms for retrieval?

Google's dominance implies that our information practices are becoming fixed not just around what information is or is not online, but also around the common source(s) we use to locate such resources. This is also brought home in the statistics about the use of Wikipedia. A Pew report for March 2007 shows that of the Internet traffic classified as relating to an education and reference cluster of websites, Wikipedia nets 24% of the traffic, followed far behind by 3-5% for Yahoo! Answers, Dictionary.com, and Answers.com, and 1-2% for SparkNotes, Google Scholar, Google Book Search, Find Articles and U.S. National Library of Medicine (Source: Hitwise data for week ending March 17, 2007 as quoted in Rainie et al, 2007). Verifying facts, using more than one search engine, and going beyond one source are all aspects of a new information literacy. Critical media literacy now entails more than just whether the information is credible or not, but also whether the search has been inclusive and diverse enough to provide more than one resource on a topic, or one entry to the information on a topic.

Beyond retrieval, we also need to consider the dynamics and importance of *contribution*. Who is contributing what kinds of information? What is the meaning of participation in an age of wiki wars, information saboteurs, and information vandals? (Kleeman, 2007). How do we teach, encourage, and model participatory practices in a way that promotes useful and usable online information? New social skills, or perhaps older ones now transformed online, become essential for a workable online future. Individual retrieval becomes collaborative participation. As Jenkins (2006, p. 20) states: "the new media literacies should be seen as social skills, as ways of interacting within a larger community, and not simply an individualized skill to be used for personal expression."

However, in this ideal of training all to participate online in an equal, democratic manner, little attention has been given to likely changes in distribution of activity and access. Discussions that extol the open web as a limitless source of information ignore the potential and reality of knowledge enclaves. These may be seen positively as think-tank retreats (e.g., in password protected sites), with entry by invitation only, permitting the selected few to work unharassed by novices and random visitors. Or they may be seen negatively as gated communities, segregated from outside influence or input, carrying on in private, creating internally-constructed views of reality. As many of us joined listservs and academic discussions at their inception, and have accumulated a 10-20 year growth in our common community, what are our limits to tolerance of newbie questions, yet more requests for literature on an well-worn subject, and the discoveries and social practices of the next generation? What will be the profile of these sites in a few years – their demographic, interaction norms, and content level?

Such trends and concerns, both pro and con need to be given considerable attention by educators and professionals, since one potential outcome is an outsourcing and bypassing of professional roles, resulting in further burden on individuals to create and enact their own learning. However, an alternative is the rejuggling of roles to address the needs of a learning in a participatory culture. This remainder of this paper explores the participatory trends affecting internet use and learning, with a view to understanding the transformations that are happening and poised to happen in learning roles, locations and practices.

## Participation

Participation connotes contribution to a community, and, in particular, contribution that furthers the goals and agenda of the community. It signals engagement and identity with the whole, demonstrated through attention and, in most cases, conformance to community norms and practices. Non-conformist contributions have their place, but entail participation only where eventually accepted as furthering the group agenda rather than that of the individual. ‘Trolls’ in online forums, and ‘griefers’ in online games, do not participate, but instead exercise personal dominance by commanding attention to themselves and away from the group. By contrast, participants are notable for their attention to others and to ongoing community interaction, and a reflexivity about their visibility whether in text, through video, or by physical presence. As noted by Benkler (2005), contributors exhibit a ‘self-conscious use of open discourse’ (p.15), for example in Wikipedia, a “self-conscious social-norms-based dedication to objective writing” (p. 14).

To participate requires knowing how to provide a contribution, which is predicated on knowledge about the reach, content, and extent of community membership, behaviors and concerns. It shares commonalities with ideas of collaboration (e.g., see Swan, 2006; Haythornthwaite, 2006a, 2006b; Haythornthwaite, Lunsford, Bowker & Bruce, 2006), and in many senses a ‘collaborative culture’ may be synonymous with a ‘participatory culture.’ If there is a distinction to be made, it is that the former tends to be used in referring to smaller working groups, particularly in the sciences, and in interdisciplinary collaborations, and in the more general conception of Communities of Practice (Lave & Wenger, 1991; Wenger, 1998). Collaborative culture tends to refer to groups that do the (often hard) work of learning to work with each other, toward common goals and outcomes. By contrast, participatory culture signals a trend to societal practice, used more widely to encompass youth as well as adult practice, arts and humanities as well as sciences, and low barriers to entry (e.g., the simplicity of wiki syntax, and participation without membership). Indeed, low technological barriers to participation appear as a key defining feature of participatory culture, as Jenkins (2006, p. 3) describes:

A participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one’s creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (at the least they care what other people think about what they have created).

Low barriers do not, however, mean no barriers. Because participation requires awareness of others – or at least that there is an audience of some known or unknown size and range – apprehensions about visibility and the persistence of postings remain as social barriers (Bregman & Haythornthwaite, 2003; Sproull & Kiesler, 1986, 1991). The continuous appearance of new technologies, even as these become simpler to use, represents another barrier as norms and practices are constantly learned and re-learned.

Moreover, in the rush to get people involved in posting, the invisible work related to posting, and the role and place of invisible participants in participatory cultures, remains – well – invisible. The work of learning to post, which often occurs as part of peripheral participation, is forgotten in discussions of participatory culture. The hidden work of gaining access to the technology,

learning the ins and outs of the applications, and learning the social norms of participation are overlooked in favor of attention to postings. Yet, watching at the periphery as a way of apprenticing with the expert is indeed legitimate participation, as so identified by Lave and Wenger (1991). As more and more effort goes into considering how to encourage participation, an equal effort must go into considering the work of becoming a poster, and the place of lurkers, observers, apprentices, and non-users in the practice of participatory culture (see also the work of Susan Leigh Star on invisible work and infrastructure: Star, 1999; Star & Strauss, 1999; Star & Bowker, 2002; for a report on non-users and the internet, see the Pew study by Lenhart et al, 2003).

Another aspect of participatory culture that requires attention is its directionality: both giving, posting, and conversing, *and* retrieving, reading, and absorbing. Onto this directionality we impose reflexivity. As described above, participation requires knowledge of the culture into which one posts, and in the action of posting, it also involves reflection on the post in the context of its posting, including its form and purpose (genre), audience, and conformity or defiance of norms (see also work by Carole Miller, Mikhail Bakhtin and John Swales; e.g., Miller, 1984, 1994; Bakhtin, 1986; Swales, 1990). An equal reflection needs to be given to retrieval of such posts. As Jenkins (2006) and many others contend, education about critical literacy and critical media skills come to the fore in such a free-for-all posting and participatory culture. Skills need to be inculcated to recognize wheat from chaff, skills that have, until now, largely been embodied in publisher selection criteria, library collection development policies, and educator curriculum and course development practices.

Reflexive participatory practice also implies mobility, as we enter into and out of “affinity spaces”, enjoying fluid and dynamic membership in different communities (Jenkins, 2006, p. 9). While Jenkins describes these affinity spaces as “highly generative environments from which new aesthetic experiments and innovations emerge,” this may again be a somewhat overstated utopian view of online engagement, and one that ignores the very benefits of light-weight participation, picking and choosing not only what space one will engage in, but also the extent of that engagement. Indeed one of the very purposes of such spaces is to learn and enjoy the status quo; and, at most, to participate in evolution rather than revolution. Imitation may be the highest form of flattery, but it is also an important part of language and community building. Copying others’ behaviors, language, visualizations, narrative style, and genres has long been recognized as signaling membership in a community (e.g., Miller, 1984, 1994). It is practice to be embraced, and taught.

In embracing participation, both light- and heavy-weight engagement need to be considered, in parallel to ideas of weak- and strong-tie, social network formation (Haythornthwaite, 2007, 2009). Each kind of participation has its own merits. Mobility affords the opportunity to engage in information tourism, visiting sites, treading lightly in the online venue, viewing without making a mark, and retrieving without making a contribution. Mobility also affords finding the site where you want to settle, put down roots, and engage with community values and directions. Each has its own information, social and communal merits – weak ties for wider exposure to opinions and ideas; strong ties for personal commitment and motivated contribution. They exist in parallel and the spectrum of engagement is a constituent part of what is participation. Thus, each space depends on some heavy-weight users and the many more light-weight users who connect this space to other venues. As in other areas of technology development, emphasis on

the strong-tie only connection has largely ignored light-weight participation, and emphasis on in-depth communal relations has ignored the benefits to diversity of multi-site, multi-task engagement (for more on strong and weak ties in online communities, see Haythornthwaite, 2002).

### **The New Relational Order**

New technologies forge new relations, and new roles for participants. This is highly evident in the way online spaces are transforming educational and authoritative practice. The following lists, in brief, some emergent trends evident in current practice that affect and are affected by the development of participatory culture, with particular attention to learning contexts.

#### *Change in relationship with leaders*

- What is expertise in the age of participatory learning, and whose definition is it anyway?

Perhaps the greatest fear among those who have spent years earning teaching certificates, graduate degrees, doctorates and tenure is that they will become obsolete or unimportant in the classroom. Similarly, information professionals, who have done the work of collecting, classifying and establishing retrieval mechanisms for information feel by-passed as students and readers move to unvetted online sources and search engines. What value does expertise have if learners are only learning from each other, if everyone can get the information on the web? The latter concern is another overstated one: textbooks have been available for less than the cost of a PC for a long time, so why the worry about online resources? A greater worry should be that learners will think the experts unnecessary, turning to online forums, blogs and communally-defined encyclopedias for what they need. For example, why grapple with library collections when user-generated tagging in social bookmarking systems such as CiteULike, Connotea, or del.icio.us produces folk taxonomies that may better reflect contemporary organization of information (folksonomies; Mathes, 2004) – and which are at our fingertips. So, too, why grapple with university degrees and diplomas if learning can be achieved through online communities. To some extent the major job of the 21st century may be selling a university education in the age of digital competition – and not just competition from online universities, but also from user-generated learning communities. True, the certification of a degree from a particular university may still matter, but we have to ask ‘to whom will it matter?’ (see also, Pittinsky, 2003; Levine, 2003).

#### *Change in relationships with concurrent learners*

- In an age of participatory culture, and participatory learning, what are the roles of learners and teachers? What are the practices required of each?

A result of the last 10+ years of online learning has been the evolution and re-negotiation of what is required of teachers and learners. For example, where bulletin board contributions replace classroom participation as they do in online learning courses, equal and sustained student participation becomes vital to a successful class. The role of students changes; they become more responsive to each others' questions and needs, thus also changing the role of the teacher. The teacher's position as the "sage on the stage" is being altered into that of the facilitating "guide on the side" (King, 1993). Furthermore, the idea of the students as "empty vessels" is being replaced

by conceptions such as "learner-leaders" (Montague 2006), who lead and contribute both to their own learning and to learning by others in the community.

Participatory learning entails instructors ceding leadership and control of learning, giving it over to participants, and encouraging a new form of co-learning pedagogy. Learning practices change from models of transfer of knowledge from one to many (e.g., instructor to students), to exchange of knowledge among many (students to students); and from transfer from expert(s) to novice(s) to collaborative, peer-to-peer learning and discovery. In this new paradigm, novices help each other make sense of the information they are receiving. They create explanations of phenomena that fit their local setting, re-supplying context that is often lost in decontextualized learning, and feeding that information back into the learning environment (Kazmer, 2005; Montague, 2006). Where appropriate, participants come to shared definition of meanings through collaborative, conversational interaction. Such emergent learning practices reinforce ideas posited by collaborative learning theories (for more on new models, see Haythornthwaite et al, under review, and the models described there, including Kazmer's (2005; 2007) 'embedded learners', Preston's (2002; in press) 'braided learning', and Montague's (2006) 'learner-leader' model).

Changes also occur with the entry of computerized personal space into the public space. While some view laptops in the classroom as threats to engagement because students can continue to participate in out-of-room communities (e.g., via social software, email), others adopt strategies for co-opting and integrating the use of laptops into daily practice become more widespread, e.g., disseminating lecture materials to laptops for enhanced note-taking, or involving students in class in searching or other online exercises.

Of course, one of the questions arising from all this participation from newbies and non-experts is whether it is creating a nation of citizens or a "nation of ankle-biters"?

"I celebrate the liberating tools that let people post their thoughts unfiltered. But as with many other utopian predictions about how the open nature of the Net will create arenas that transcend foibles of the physical world, our faults have followed us to cyberspace. We were promised a society of philosophers. But the Blogosphere is looking more and more like a nation of ankle-biters." (Levy, 2004).

Levy's frustration with bloggers is easily mirrored in experiences of listserv and online class participation. Murphy & Collins (1997) noted early on the need to manage online discussion in classes so students engaged appropriately. However, this early attention focused on inhibiting inappropriate and off-topic behavior. Now, the focus is on how to increase participation in online classes, trying to compensate for the reduced cues of the online environment on the way to creating online learning communities (Barab, Kling & Gray, 2004; Jorbring & Saljo, in press; Renninger & Shumar, 2002; Swan, 2006).

But generalized participation has its limits. In forums open to anyone, current learners may tolerate questions about the basics, but when novices mix in forums for experts, such questions are likely to be answered by being told to read the FAQ, search the archive, or search the web. The mix of levels of expertise in a forum, listserv or participatory space, requires tolerance of continuous reinvention of the wheel. Such multi-level interaction suggests a limit to the utility of a single forum, leading to factions and splinter groups (for a negative connotation), or to

specialty groups (for a positive connotation). Prime movers may themselves move out as their spaces become inhabited by newcomers, or by intolerably disruptive behaviors. Unbridled participation without attention to group and space norms will have fallout. We can expect to see more gated communities and moderated lists arising as the tragedy of the commons strikes repeatedly in cyberspace.

#### *Change in relationship with previous learners*

- What will become of the persistent record left by so much participation? Will its historical record be used? How will it be mined for learning?

Online conversations and postings in listservs, bulletin boards, web pages, blogs, wikis, leave an accessible record that can be reviewed and revisited. Such persistent records can leave earlier learners still present in an online conversation long after they have left the community. Although written records have persisted in the past, the easy search and retrieval of online records makes their impact all the greater. Searching now often turns up essays written for classes, syllabi of courses, discussions on listservs. Although not generally made public, whole course conduct is saved in iterations of online classes. What use will be made of these various persistent records?

As noted above, in open forums many levels of expertise may mingle. Already the FAQs represent some conversation with earlier participants, as does examining the archive of a list for previous discussion. Multi-level interaction can be expected in some learning communities, with different trajectories and continuities of participation and narrative co-existing.

Persistence in the data record also allows for near-term use. How will transaction records be used to enhance, monitor and/or assess online interaction in learning settings? Hyperlink analyses already examine interconnections among ideas (e.g., in the areas of webometrics, Thelwall & Vaughn, 2004; and hyperlink network analysis, Park, 2003). Efforts in data mining are just now beginning to enter the learning area; although not yet used extensively, it can easily be imagined that it will not be long before at least some basic statistics from such applications will be integrated with learning management systems (Minaei-Bidgoli, Kortemeyer, Punch, 2004; Haythornthwaite & Gruzd, 2007)

#### *Change in relationship with documents*

- What's in a name? What is the worth of a publisher's or journal name in the age of wikipedia?

As more and more information goes online, as noted above, the effort to establish what is correct, truthful, balanced, and worth paying attention to is increasingly falling to users. Although this may seem to have been the case in choosing what to read in the past, the number of books on a topic, or journals of good repute are far more limited than the potential of postings to the web. Yet, the web is at our fingertips, and at the fingertips of learners. Hence, the relationship with documents changes in subtle ways that need to be examined in more depth than is possible in this short paper. Suffice it to say for now that some of the key issues involve trustworthiness of sources, mutability of online resources (e.g., in wikis), authorship (e.g., is this "R. Smith" that same as any other "R. Smith" posting), conversation as textual sources (e.g., taking ones evidence from blog postings), disappearance of sources (e.g., when web sites are no

longer maintained, when sites move), text as conversation (wikis) and conversation as text (bulletin boards, listservs, email, blogs), and non-text documents as texts (video, multi-media texts). Again, there is an increased role for media literacy, i.e., critical evaluation and (de)construction of meaning for online contexts, and for adults as much, if not more so, than for school-age youth.

#### *Change in relationships with local communities and networks*

- What does local mean when learning online? Who is in your community?

The meaning of local changes when learning and participating online. We still live in a local geographically-based community with its own culture, and where we meet face-to-face with friends, family and co-workers. There is also the online community, perhaps several, where we engage with others around work or personal interests. Our online community may be highly local in the sense of personal, as we engage with friends and family online, or local in the sense of regional, as we engage with others about critical events in our locale. For example, during the UK foot-and-mouth disease crisis, the Internet became a lifeline for exchanging information and support about dealing locally with the disease and its impact on the lives and livelihoods of farm neighbors (Hagar & Haythornthwaite, 2005). Finally, we may find that our personal postings are no longer local, but instead have taken on global character as the entire web-reading community gains access to our texts. In posting to the open web, what is personal becomes global, and in collaboration with others may also be multi-communal and multi-national.

As many have noted already about the Internet, virtual communities may spread widely across geography while glued together by common interest. For example, BurdaStyle (<http://www.burdastyle.com/>; Abousteit, 2007) provides a site for sewing enthusiasts from around the world. Building on the company's offline reputation for sewing patterns and fashion, BurdaStyle provides patterns in a open source manner, i.e., they may be modified, used, sold, and uploaded again to the site. A growing community of BurdaStyle members contribute not only patterns, but also instructional videos and photos sequences for teaching sewing techniques, definitions for a sewing terms dictionary, and discussion of techniques. The features of the site and the efforts of the organizers lay the foundations for a learning community, one that is rapidly gaining critical mass toward self-maintenance. It demonstrates many ways in which enthusiastic amateurs (and some aiming for professional lives) distributed across geography, can come together to create and sustain a learning community.

As the web reaches worldwide, education via the web is increasingly becoming globalized. Different skills are emerging for teaching and for learning on a global scale for a global practice, including how to teach and learn in multi-time zone, multi-institutional, and multi-cultural settings. Asynchronous learning networks (ALN; see the *Journal of Asynchronous Learning Networks*, <http://www.sloan-c.org/publications/jaln/>) help with crossing time zones, but local social practices are enacted to deal with time-distributed conversations and learning communities. Multi-institutional alliances are developing that provide opportunity for thinly distributed specialists to share expertise and learn from each other. For example, the World Universities Network ([www.wun.ac.uk](http://www.wun.ac.uk)) supports distributed seminars facilitated through high-end videoconferencing supported through Grid technology. Another example is the Web-based

Information Science Education (WISE) program that shares seats in online classes across participating institutions (<http://www.wiseeducation.org/>).

Through such programs, online skills, knowledge, and practices spread along different geographies than offline learning. Kazmer (2005, 2007) describes how online learners form important learning relationships with both their local-online fellow students *and* their local-offline work mates and community members. Online learning is simultaneously embedded in the geographically-based community, providing an opportunity for learners to engage locally and to share experiences globally.

With all the emphasis on participation and engagement online, and with taking classes anywhere, anytime, the simultaneous demands of the local context and multiple social worlds continue to be overlooked; they remain an invisible part of learning contexts. Discussion of online learning overwhelmingly concentrates on the world of the class, but online learners are simultaneously juggling commitment in their home and work worlds, often adding learning as a ‘third shift’ (Kramarae, 2001). Locally, accommodations are made in the physical and social arrangement of home and work to partition learning from these other worlds. For example, parents report carving out at-home space and time for their online education, requiring others to care for children at that time (Haythornthwaite & Kazmer, 2002). Overall this raises the question of what kinds of boundaries will we need to recreate in our local worlds to reinvent those formally defined physically but now needing to be enacted socially? And, as email, cell phones, and mobile computing increasingly engage us in anywhere, anytime, anyone communication, how will we partition time and attention in our cyber-worlds as messages about work, home, and learning reach us at anytime of day or night in any one of those local physical settings? (For more on juggling worlds, and accommodations made in home settings, see Haythornthwaite & Kazmer, 2002; Kazmer, 2005, 2007; Kramarae, 2001; Salaff, 2002).

### **Towards an Agenda for Ubiquitous Learning**

This paper has briefly addressed some transformations affecting learning that are emerging from social and technical practices around participation, and which are creating a culture of ubiquitous learning that occurs anywhere, anytime and with contributions from anyone. These transformations include less regulated information content and retrieval, changing roles in who leads and who follows as authorities and consumers or learners, and a greater role for the individual in information management, information contribution, and participatory citizenship. Transformations are also occurring in the ‘who and where’ of how we learn and engage with others. Traditional university instruction changes from the classroom to online or blended (on and offline) classes, from single institutional offerings to classes chosen from regional or global offerings. Learning leaves the classroom and local geography to engage regionally and world-wide in online learning communities, sustained by participation and contributions by and for learners. These are trends to follow that are important for understanding local, in-class, on-campus learning practices, and the wider, global, open web, ubiquitous learning happening everywhere and every day.

As this phenomenon unfolds there are many directions for an agenda to both promote and monitor the progress of ubiquitous learning. The main point made in this paper is to consider both the visible and invisible aspects and consequences of these participatory transformations. An agenda for ubiquitous learning involves understanding its full ecology – from individual

contribution to communal practice, from submission to retrieval, from lurker to community leader, and from the local to the global. A movement is already underway that gives enhanced attention to participation, e.g., in discussions of as peer production, participatory culture, virtual communities, and learning communities. Critical media literacy already lays the groundwork for assessment and evaluation of resources retrieved from online sources. But there is still work to be done in understanding participatory transformations and how to prepare individuals to teach and learn in this new culture.

First, a critical retrieval literacy is needed that includes not just notions of whether a source is credible or not, but also whether contributions are being made equally across societal sectors (e.g., considering current manifestations of the digital divide), whether retrieval via available search engines is creating exclusive and exclusionary paths to information (e.g., whether popularity should be the top criterion for relevance).

As individuals increasingly become contributors to the wealth of information and knowledge on the web, it is important that contributions be representative of different histories, experiences, and worldviews. This involves examining the range and breadth of contributions to see how the digital representation of cultures is unfolding online, and encouraging and making possible online representation of a wide range of cultures as well as making room for new cultural expressions. This involves issues of access to contemporary technology, education in use of technologies, creation of culture-friendly sites and resources, and representation in multiple languages.

Education is essential for assessing content and materials online. As noted, new forms of contribution, participation, and organization shifts the work of information assessment and evaluation to the individual user. Moreover, education in the underlying information and technology structures can aid in understanding both how to put information online and how it is likely to be found by others. Critical technology evaluation – from the basics of classification systems to the hidden work of search engines – is an important, if not essential, for the educated poster and retriever of the future.

An agenda for ubiquitous learning also needs to engage with understanding the community networks being created and sustained via the web, and the ecologies of on and offline life and information. Each contribution to a central server also affects locals at each retrieval site, and affects who then finds a common home in that online space. It is of great interest to see how this unfolds as participatory culture takes hold, providing an understanding of participatory communities as well as cultures.

### **Readings and References**

For further reading on participatory culture and education see the white paper by Henry Jenkins, prepared for the MacArthur Foundation. For more on peer production, see Eric Raymond on the ‘cathedral and the bazaar’ models of contribution, Yochai Benkler’s *The Wealth Of Networks*, and the work by Lawrence Lessig (<http://www.lessig.org/>) on Creative Commons licensing (<http://creativecommons.org/>). For recent papers on participation, transformation and leading trends in education and e-learning, see the *Handbook of Elearning Research* (Andrews & Haythornthwaite, 2007), and literature reviews on the Futurelab site (<http://www.futurelab.org.uk/>).

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