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Teaching and Learning in the Web 2.0 Era: Empowering Students Through Learner-Generated Content

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Abstract

This article describes how the emergence of “Web 2.0” technologies and social software tools is creating a new set of dynamics leading to increased user-led content and knowledge production that is transforming higher education curriculum and instruction. It considers the different ways in which social computing applications can be used for teaching and learning, and suggests changes to pedagogy based on greater learner control, agency, and engagement in content creation, as well as peer-to-peer sharing and review of ideas. It presents a number of exemplars and cases of learner-generated content from universities around the world, and discusses the themes of pedagogical transformation that emerge from an analysis of these cases. It also discusses a number of challenges facing the production and adoption of learner-generated content in higher education, and suggests some possible ways forward to meet these challenges.

Keywords: Web 2.0, social software, user-generated content, student-centered learning, peer-to-peer learning, knowledge creation metaphor of learning, higher education, blogs, wikis, social networking, learning community, pedagogy

Introduction

In higher education, traditional approaches to teaching and learning are typically based on pre-packaged learning materials, fixed deadlines, and assessment tasks designed and stipulated by teachers. With the advent of and growth in popularity of “Web 2.0” (O’Reilly, 2005) services and tools, the increased prevalence of user-generated content (UGC) has implications for learning environments in higher education, and is already influencing pedagogical choices and approaches (Williams & Jacobs, 2004). The new affordances of Web 2.0 are now making learner-centered education a reality, with tools like web logs (blogs), wikis, media sharing applications, and social networking sites capable of supporting multiple communities of learning. These tools enable and encourage informal conversation, dialogue, collaborative content generation, and the sharing of information, giving learners access to a vast array of ideas and representations of knowledge. As a result, the one-way flow of information between teacher (as expert) and student (as novice) is now being challenged.

In what is seen as a user-driven revolution, there is a shift away from the production of Web content by traditional, “authoritative” sources, towards content that is generated by the users themselves. In academia, the users are students and they now have the tools, spaces, and skills to contribute ideas and publish their views,

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research, and interpretations online. UGC can come from myriad sources, and is a result of the ease with which social software can be used to create, share, augment, tag, and upload content. In this article, the authors take the view that the UGC movement is reshaping the debate over both *what* we teach and *how* we teach it.

How is Teaching and Learning Changing?

Though learning management systems (LMS's) that integrate geographically dispersed learners in asynchronous interactions have been widely available for a number of years, many higher education institutions are discovering that new models of teaching and learning are required to meet the needs of a generation of learners who seek greater autonomy, connectivity, and socio-experiential learning. The rigidity of many LMS's and learning tasks dominated by instructor-generated learning objects have for a long time cast students into consumers of information (cf. Downes, 2005, 2007; Dalsgaard, 2006).

The reality is that today's student "audience" is very much in control of the content found online; students are no longer passive consumers of knowledge but also producers, or "prosumers," indicating a more active approach to learning (Klamma, Cao, & Spaniol, 2007). The Pew Internet & American Life Project (Lenhart & Madden, 2005) reports that approximately 50% of all teens in the United States, which equates to 12 million youth, not only participate in online activities but also create their own online content through blogs, personal Web pages, and remixing. Students, as members of the open culture of Web 2.0, are finding new ways to contribute, communicate, and collaborate, using a variety of accessible and easy-to-use tools that empower them to develop and share ideas. The most popular and fastest growing Web sites on the Internet (e.g. *YouTube* and *MySpace*) are all making use of this generativity, which is redefining how we think about creativity and provokes us to consider how new modes of community-based sharing and content creation might be applied to the more formal spaces of learning in colleges and universities.

The Shift in Power: How Social Software Tools Empower the User

As a result of the changing profile of the university and college student (Windham, 2006), we are witnessing a blurring of the distinctions between learning, work, and play. New models for teaching and learning may be needed to replace the traditional, "closed classroom" models, which place emphasis on the institution and instructor. Many popular LMS's commonly used by educational institutions to support online learning replicate these models, conforming to a classroom or lecture hall metaphor in their design, thereby further reinforcing instructor-centered approaches to teaching, learning, and content production. As such, many authors and commentators are suggesting that they may be outdated in the Web 2.0 era (Cross, 2006; Karrer, 2006). The inventor of the Web, Tim Berners-Lee (2000) foreshadowed a more active suite of tools that were not simply about passive downloading and consumption of information when he stated, "I have always imagined the information space as something to which everyone has immediate and intuitive access, and not just to browse, but to create" (p. 169). Now, social

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software tools make it easy to contribute ideas and content, is placing the power of media creation and distribution into the hands of “the people formerly known as the audience” (Rosen, 2006), and that includes our students.

A few examples will illustrate the new forms of participation enabled by social software tools. Youth are now engaged in creative authorship by being able to produce and manipulate digital images and video clips, tag them with chosen keywords, and make this content available to their friends and peers worldwide through *Flickr*, *MySpace*, and *YouTube*. Other individuals write blogs and create wiki spaces where like-minded individuals comment on, share and augment these sources, thereby creating a new genre of dynamic, self-published content. This outpouring of information and digital user-generated content between peers has been dubbed “personal publishing” (Downes, 2004). As to why people engage in such creation and production, the answer may lie in the ease of use and the urge to connect and share, or according to Wu (2005, cited in Anderson, 2006), it has much to do with the desire of individuals to be noticed and gain exposure: “... the ‘exposure culture’ reflects the philosophy of the Web, in which getting noticed is everything” (p. 74).

This stands in stark contrast to the control culture of education, where pre-packaged content and teacher-designed syllabi dominate, thereby denying students choice and autonomy in shaping their own learning trajectories. According to Dron (2006), such approaches lead to de-motivation, boredom, and confusion. The challenge for educators is to enable self-direction, knowledge building, and learner control by providing options and choice while still supplying the necessary structure and scaffolding. A growing number of teachers have begun to witness first hand how social software tools offer rich possibilities for students to create and share ideas, and the take on roles as content creators. However, in advocating that students play an active part as contributors of content, the issue of what role content should play in higher education teaching and learning needs to be addressed.

The Role Of Content in Higher Education Teaching and Learning

Boettcher (2006) suggests that there is a need to carefully re-evaluate the role of content in courses, and differentiates between three major types of content (Table 1).

Table 1

Categories of Content in Courses

<i>Pre-packaged authoritative content</i>	Represents vetted scholarship, developed primarily with the discipline and content perspective in mind, as opposed to catering for the individual learner or context. It may include textbooks and other readings, problems, tests, and quizzes assessing core concepts and principles, presented in either hard copy (printed) or electronic (CD-ROM, Web site, audio book) format.
<i>Guided learning materials</i>	Materials produced specifically for a course and/or cohort of students by a faculty member prior to and during a course, and may include things such as the syllabus, projects, assignments, discussion reviews, assignment feedback/post-mortems, and responses to students' questions.

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<p><i>Student performance content</i></p>	<p>Content that is dynamically and spontaneously generated by students in the process of learning, including both completed project/assignment work or deliverables (i.e. end <i>products</i>) as well as evidence of the <i>process</i> of learning, such as successive drafts of solutions, descriptions of mistakes made, or difficulties encountered. This category may also include:</p> <ul style="list-style-type: none"> • synchronous and asynchronous computer-mediated communication (CMC) discourse (e.g. chat logs, discussion board postings); • reflective writing in the form of learning journals/diaries, summaries, and reviews, created by students working individually or in teams; • “found” content, including the results of students’ own wide reading of Web sites, journals, magazines, and news articles that they bring to and share with one another in the learning environment.
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The third category in Table 1 is beginning to receive increased emphasis, amid a higher education climate in which the value of textbooks is being questioned (Moore, 2003; Fink, 2005), and in which the open source and open content movements (Beshears, 2005; Massachusetts Institute of Technology, 2007; *MERLOT*, 2007) are gaining attention and traction. Clark (2003) also points towards the “Napsterization” of e-learning through peer-to-peer (P2P) file and media content sharing services. Today’s younger students perceive little value in the rote learning of factual information, given the accessibility and ease of use of search engines and Web-based reference sites such as *Google* and *Wikipedia*. Instead, the real educational value lies in the facilitation of a learning experience in which the students are empowered to create their own content.

Sener (2007a) suggests that a move towards learner-generated content has the potential to change education for the better – for example by increasing student engagement, developing critical thinking skills, and fostering a sense of community, while also resulting in products of lasting value to students individually, to peers, as well as to the wider community and society as a whole. The primary purpose of learner-generated content is to stimulate lasting, more permanent knowledge growth within learners through sharing and molding their unique knowledge structures, as well as through their active involvement in one another’s learning trajectories. There is also potential for some learner-generated content to be stored for later re-use. For example, Mayes and Dineen (1999) and Hartmann (1999) advocate the use of “tertiary courseware” in the form of educational dialogue such as questions, answers, and discussions (as opposed to primary courseware, which is courseware intended to present subject matter to students; or secondary courseware, which comprises the environments, tools, and materials used to facilitate the performance of learning tasks by students). While the application of tertiary courseware may support learning by supplying learners with feedback for conceptualizations and exposing them to other people’s understanding through vicarious participation (McKendree, Stenning, Mayes, Lee, & Cox, 1998) in the dialogue, Boettcher (2006) maintains that the key focus of learner-generated content is on the *process* of content creation and knowledge construction, as opposed to the end *product* itself. Supplied content is only one of many resources available to assist students in developing knowledge and skills, and has limitations, particularly if it pre-empts learner discovery and research, and active student involvement in the knowledge creation process.

Three Metaphors of Learning

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Learning with social software tools compels us to reconsider how new tools and the interconnectedness offered by Web 2.0 impact on pedagogy, and opens up the debate on how we conceptualize the dynamics of student learning. Sfard (1998) distinguishes between two metaphors of learning, the *acquisition metaphor* and the *participation metaphor*. The former represents a receptive view according to which learning is mainly a process of acquiring chunks of information, typically delivered by a teacher. An alternative model, according to Sfard, is the participation metaphor, which perceives learning as a process of participating in various cultural practices and shared learning activities. The focus is on the process, that is, on learning to learn, and not so much on the outcomes or products. According to this view, knowledge does not exist in individual minds but is an aspect of participation in cultural practices (Brown, Collins, & Duguid, 1989). Both individuals and their environments contribute to the processes of cognition, and learning is embedded in multiple networks of distributed individuals engaging in activities. By adopting a participation metaphor, learners engage in social processes of knowledge construction such as “enculturation,” “guided participation,” or “legitimate peripheral participation,” all of which are grounded in socio-cultural theory (Lave & Wenger, 1991; Vygotsky, 1978).

However, learners are also capable of creating and generating ideas, concepts, and knowledge, and it is arguable that the ultimate goal of learning is to enable this form of creativity. Current views of knowledge regard the notion of an instructor-dominated classroom and curriculum as obsolete, and embrace learning environments where students take control of their own learning, make connections with peers, and produce new insights and ideas through inquiry. Thus, to keep pace with the content creation processes enabled by Web 2.0 and social software tools, it appears to be necessary to go beyond the acquisition and participation dichotomy. Paavola and Hakkarainen (2005) propose the *knowledge creation metaphor of learning* (Figure 1), which builds on common elements of Bereiter’s (2002) theory of knowledge building, Engeström’s (1987, 1999) theory of expansive learning, and Nonaka and Takeuchi’s (1995) model of knowledge creation.

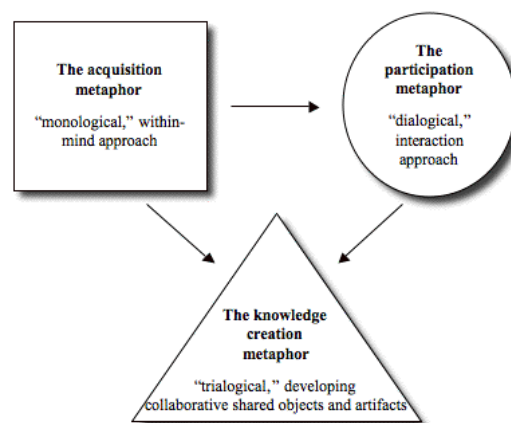


Figure 1. Three metaphors of learning (Paavola and Hakkarainen, 2005 – Reproduced with permission)

From the perspective of the knowledge creation metaphor, learning means becoming part of a community, through creation and contribution of learning resources. Students are both producers and consumers (“prosumers”), of knowledge, ideas, and artifacts. As newcomers to a community of practice, they not only engage in “legitimate peripheral participation” (Lave & Wenger, 1991) to develop their own mastery of knowledge and skills through interaction with experts such as their instructors, but also have a responsibility to play a part in the continued advancement of the community’s existing body of knowledge, as they move toward full participation in the socio-cultural practices of this community (Lee, Eustace, Hay, & Fellows, 2005). In a knowledge building community, members are managers, or “curators” of the community’s knowledge artifacts (Eustace & Hay, 2000), intent on making responsible decisions in addition to generating novel and innovative contributions to benefit the community as a whole. The knowledge building paradigm is therefore well suited to social learning environments where digital affordances and tools enable students to engage in rich and creative experiences, where they move beyond participation in communities of learning, to active creators of ideas, resources, and knowledge, as is evident in the processes underpinning learner content creation.

Exemplars of Learner Content Creation in Higher Education

A number of academics have risen to the challenge of adopting learner-generated content and integrating it into their pedagogy. The following are examples drawn from a range of teaching and learning contexts across a variety of academic disciplines:

- At the University of North Carolina at Pembroke (UNCP), Dr. Kenneth Mentor’s courses make use of a wiki maintained by students, with the goal being to create encyclopedia entries on a variety of subjects related to law, criminal justice, sociology, and criminology. In previous courses, Mentor’s students created Web pages as class assignments. The *Online Encyclopedia of Criminal Justice* (2006) project extends those efforts in two notably powerful ways: using a wiki enables learner-generated content to be readily shared in virtual “public spaces” and to a broader audience beyond the walls of the classroom, and the wiki’s ease of use enables students to create substantial amounts of content within a short timeframe. In addition to generating and entering initial content, students also perform the roles of editing, revising, and organizing the content, which becomes part of the shared pools of resources accessible to all learners. Although all site content was initially written by UNCP students, the site is now available for educators to use for class assignments. Users outside the institution are allowed to register and contribute (Sener, 2007c);
- In the English as a Foreign Language (EFL) domain, Professor Steve McCarty of Osaka Jogakuin College asserts that “... content creation also makes [students] part of the target language community, not just passive recipients or spectators of a foreign culture, which benefits their motivation and development of a bilingual identity” (McCarty, n. d., cited in Sener, 2007b, sec. 2, para. 1). While teaching an intensive course on translation at Matsuyama Shinonome College, McCarty (2005a) invited two Chinese and two

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Japanese students to engage in a discussion that was recorded as a podcast. The students were asked to each explain five given proverbs, in English as well as in their native language, as part of an attempt to explore if there was a similar way of thinking in the three cultures. The proverbs were: (1) Actions speak louder than words; (2) Advice when most needed is least heeded; (3) Look before you leap; (4) Penny wise, pound foolish; and (5) Ignorance is bliss. McCarty also maintains his own publicly accessible, bilingual podcast feed and blog, *Japancasting* (McCarty, 2006), targeted at those studying either Japanese or English as a foreign language. The podcast episodes cover Japanese culture, history, folklore, and comparative religions, as well as contemporary social issues such as the education system and the rights of minorities (e.g. foreigners) in Japan. In many of the podcasts, students from Osaka Jogakuin College serve as voice actors or interviewees, and in some cases present their own creative work/scripts. Although they remain anonymous, the students are excited and motivated by the prospect of broadcasting to a worldwide, Internet audience (McCarty, 2005b; Sener, 2007b);

- Students studying German and Spanish courses in distance education mode with the Open University in the United Kingdom use digital voice recorders and mini-camcorders to record interviews with other students and with native speakers, as well as to create audio-visual tours for sharing with their peers (Kukulska-Hulme, 2005);
- In a literature class on U.S. fiction led by Peter Schmidt at Swathmore College, students were assigned the task of creating a “podcast pair” consisting of a five-minute reading of a chosen passage from a novel, coupled with a five-minute discussion of the passage and its relationship to other material. All students in the class were required to download and listen to selected podcasts by their classmates on what they were reading, prior to attending face-to-face class discussions (Evans, 2006);
- Wenzloff (2005) uses the social bookmarking site *Furl* in teacher training. He uses the export feature of Furl to quickly and easily generate online or paper handouts of the resources he has bookmarked for the class. In addition, the pre-service teachers he work with use their own Furl accounts to tag, annotate, and share the resources they have found with their peers. Wenzloff subscribes to the RSS feeds of the student teachers’ Furl sites, to examine what Web sites they have been reading as well as the comments they have written about these sites (Richardson, 2006);
- To support his course in General Psychology at the University of Connecticut, Miller (2006, 2007) hosts weekly informal discussions with students following each week’s lectures. During these discussions, students are able to seek clarification on the course material and talk about it in greater depth, as well as to discuss issues not covered during the lecture. The discussions are recorded and made available to other members of the class as a series of podcasts. In this way, the podcasts are *about* course content (meta-cognitive) rather than simply being recordings of the course content itself (transmission of content). The process of creating and participating in the discussions is an

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instance of learner-generated content creation – All students in the cohort are welcome to submit questions in advance of the discussion via email; these answers, as well as those asked by students who attend in person, are answered during the discussion, and the dialogue can be captured, used, archived, and re-used as a form of “tertiary courseware” (Hartmann, 1999);

- In a project at Charles Sturt University, a group of second year undergraduate students produced short, three to five-minute talkback radio-style podcasts for pre-class listening by first year students enrolled in a subject that the second year students had successfully completed in an earlier semester (Lee, Chan, & McLoughlin, 2006). The brainstorming of script ideas, as well as the scriptwriting, editing, and recording of the podcasts, was driven by the student producers, with minimal teacher intervention in the process. The task outcomes were to develop a range of technical competencies, to foster generic attributes such as teamwork and presentation skills, as well as to enable students to express and conceptualize their understanding of previously learned subject matter. By engaging in collaborative peer review and critique of podcast scripts, students extended and adapted content for distribution to an audience of peers;
- At Bentley College, USA, Information Technology (IT) students enrolled in Mark Frydenberg’s (2006) *IT Intensive* course purchase Pocket PCs instead of textbooks, which they use to explore technology concepts in a hands-on, learner-centered approach. Participants form pairs or groups and work together to plan and produce vodcasts. Each group produces a vodcast on one of the topics in the course schedule, for sharing with the rest of the class. This may be viewed as a novel form of peer and reciprocal teaching, and serves a dual purpose: In the process, students not only display their understanding of the course topics through the production of content for their peers, but also develop and exercise IT skills that are directly linked to the objectives of the course;
- Undergraduate students studying first year (freshman) level introductory IT subjects at Charles Sturt University and Bentley College have been working in teams consisting of a mixture of students from each institution. Each team is given the task of collaboratively producing a short podcast, to be recorded over Skype (i.e. a “Skypecast”), in which team members discuss issues/topics on technology and culture that are common to the curricula at both institutions. The students must overcome issues related to cross-cultural communication, as well as challenges that arise from working with team members whom they are unable to meet face-to-face, across disparate time zones, to produce the joint artifacts (Chan, Frydenberg, & Lee, 2007).

These examples provide evidence that social software can extend the range of experiences available to students, and enable them to engage with multiple digital tools and overlapping knowledge sources. They also herald changes in how we conceptualize practices of learning and creativity, demonstrating a move away from solitary achievement to collaboration within multiple communities of practice in an “always on” cultural space. Clearly we are operating in an information environment where students have access to vast amounts of data, and where they can reuse and

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remix information in a spirit of open collaboration. It is also evident that in the cases cited, where students create and share content and ideas using a range of social software tools, that a new form of pedagogy is emerging that is recasting traditional roles by enabling greater learner autonomy, self-direction, and risk-taking. While there is little formal evaluative data available of actual learning outcomes, it is clear that these new practices allow and support key educative functions for learners as follows:

1. To produce, edit, and publish ideas to a wider audience of peers, and to subsequently rework published ideas on the basis of critique and feedback obtained, and/or to allow the ideas to grow, change, and evolve at the hands of the community (Sener, 2007c; Lee, Chan, & McLoughlin, 2006);
2. To demonstrate communicative competencies such as the capacity to create scripts and record podcasts on a range of cross-cultural themes and concepts, sometimes in a foreign language (McCarty, 2005a, 2005b; Kukulska-Hulme, 2005; Chan, Frydenberg, & Lee, 2007);
3. To participate and collaborate in formal and informal learning networks beyond classroom walls, thereby soliciting multiple perspectives and going beyond the limitations of their own viewpoints (Chan, Frydenberg, & Lee, 2007; Kukulska-Hulme, 2005; Wenzloff, 2005);
4. To personalize learning events, following through on individual interests while taking into account multiple sources of information to achieve a balanced and critical view of knowledge generated (Evans, 2006; Miller, 2006, 2007; Frydenberg, 2006; Lee, Chan, & McLoughlin, 2006; Wenzloff, 2005);
5. To demonstrate essential generic skills such as communication, digital literacy, and presentation skills, as well as to construct and consolidate knowledge through creating multimedia learning objects for peers (Lee, Chan, & McLoughlin, 2006; Kukulska-Hulme, 2005; Evans, 2006; Frydenberg, 2006).

Challenges and Possible Responses

While social software tools and learner-generated content offer fruitful prospects for empowering learners in line with the knowledge creation metaphor of learning, heutagogical approaches (Hase & Kenyon, 2000) to education such as those advocated in the present article will likely be met with considerable resistance and opposition from education practitioners and researchers. For example, as the expression goes, this is the era of “mix, rip, and burn, and there is concern that “students want to be able to take content from other people. They want to mix it, in new creative ways—to produce it, to publish it, and to distribute it” (Hilton, 2006). Such practices raise questions about the importance of originality from the point of view of academic integrity, and give rise to concerns about copyright, ownership, and intellectual property within the context of both student learning and assessment through learner-generated content. Moreover, in adopting learner-generated content for consumption by other students, there is a concern about the validity and reliability of the content that is produced.

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In response to these challenges, the authors believe that change is unavoidable and inevitable. Learning designs that hail the instructor and textbook as the sole authoritative, expert sources of information are incongruent with the rapidly changing social and technological landscape that Web 2.0 and the open content movement form part of. Today, we are witnessing a proliferation of personal publishing media and spaces using a range of free, Web-based services and open source software tools, along with the apparent random and open production and delivery of content. As content is increasingly mashed-up, blogged, and syndicated in numerous different locations, individuals have instant access to ever-expanding volumes of information, and are constantly bombarded by rafts of diverse and often conflicting ideas and representations. Information users are faced with the challenge of judging the quality of sources they come across, and discerning their suitability or otherwise for a variety of purposes. Beyond simple “search and retrieval,” the information must be contextualized, analyzed, visualized, and synthesized (Lorenzo & Dziuban, 2006; Windham, 2006).

Recent research has shown that many higher education students currently lack the competencies necessary to navigate and use the overabundance of information available, including the skills required to locate high quality sources and assess them for objectivity, reliability, and currency (Katz & Macklin, 2007). To continue to “shelter” them from these challenges within a “closed classroom” academic environment would be to do them an injustice, as it would in effect be denying them valuable opportunities to develop the competencies they need to meet the demands and challenges of the twenty-first century workforce, and of life and lifelong learning in modern society at large. Students need to develop sound information literacy skills in effectively finding, evaluating, and creating information, which often involves complex critical thinking skills (Lorenzo & Dziuban, 2006; Windham, 2006). Many of the examples presented earlier in the present article demonstrate that the appropriate use of learner-generated content can also serve as levers for such critical thinking and meta-cognitive development (e.g. Sener, 2007c; McLoughlin, Lee, & Chan 2006).

In many educational scenarios and cases it may transpire that there is still a need for gatekeepers and other quality assurance/control mechanisms; however, the authors believe that the review, editing, and quality assurance of content can be done collaboratively and in partnership with learners, while also drawing on input from the wider community outside the classroom or institution (the notion of “wisdom of crowds” [Surowiecki, 2004]). For many teachers and administrators the major obstacle to embracing learner-generated content will be accepting the need to relinquish some degree of control, which they may be apprehensive to do since this is a major departure from the manner in which their jobs have traditionally been done and are expected to be done. Traditional views of instruction and curriculum design emphasize didactic and transmission-oriented methods whereby it is the teacher’s responsibility, as the expert, to impart knowledge to students. The case studies presented in this article suggest that not only will decisions have to be made in partnership with learners, but in addition, other stakeholders and communities must be actively involved in the process as well.

Conclusions

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Web 2.0 tools such as blogs, wikis, RSS, podcasting, social networking, tag-based folksonomies, and peer-to-peer (P2P) media sharing enable connectivity and make it easier for students to connect with and learn from one another. "Learner-generated content" is a reminder that with the help of such supporting tools, appropriate activities empower participants and allow them to exercise their creativity, enabling collaboration and the production of shared artifacts. A major outcome of learner-generated content is the "collective intelligence" or the "wisdom of the crowds" (Surowiecki, 2004) that emerges from working cooperatively, sharing ideas, and engaging in consensus decision-making with other learners/users in groups and communities that transcend the boundaries of the classroom or institution.

Most of the user interaction in "Web 1.0," characterized by technologies such as chat rooms, bulletin boards, and email, was centered around dialogue or conversation, which mirrors the participation metaphor of learning. With Web 2.0, the contributions of the community play a pivotal role, and many Web sites exist solely as vehicles for supporting those contributions. At the heart of the experience is actively generating and/or sharing data (files, music, photographs, video, interesting Web sites), often in a "remixed" or "mashed-up" fashion, corresponding to a merging of participation and creation.

The previous section discussed some of the challenges associated with teaching and learning strategies based around learner-generated content. At a broader level, learner-generated content brings into question the role of, and even threatens the authority held by, universities and colleges as providers of credentialed learning:

... in higher education, the usage of Web 2.0 technologies has the capacity to accelerate the pace of advancement in knowledge building and sharing but with unforeseeable consequences and outcomes. In such an environment the academic is not in control, universities are not as able to restrict the learning to those enrolled, and rights to collaboratively determined knowledge are uncertain. Web 2.0 heralds a new age of uncertainty ... (Nagy & Bigum, 2007, p. 82)

Yet these changes are inevitable and unavoidable, given the morphing nature of higher education, including the fusing and merging of formal and informal learning and the rise of the millennial learner, within the context of even broader and more profound societal and technological changes. The main difficulty is a practical one: How do educators break down institutional containment fields while still retaining the coherence and credibility demanded of an educational institution? As the examples in this article show, the design of learning and assessment tasks must be a shared process between educators, students, and stakeholders who may be external to the academic environment. There must be a real delegation of academic ownership and judgment beyond classroom walls.

In conclusion, the authors believe that educational technologies – including that are part of Web 2.0 and beyond, are best used to supply support and scaffolding for learning and reflection within the authentic, real world contexts in which knowledge construction naturally occurs. A range of learner-centered pedagogies should afford students a true sense of agency, control, and ownership of the learning experience, and the capacity to create and disseminate ideas and knowledge. To deliver such an

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entitlement, we need to leverage the available technologies to extend and transform current practices, while keeping learners and the social dimensions of learning at the forefront.

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