

Web 2.0 tools and processes in higher education: quality perspectives

Betty Collis^{a*} and Jef Moonen^b

^a*Faculty of Behaviour Sciences, University of Twente, Enschede, The Netherlands;* ^b*Moonen & Collis Learning Technology Consultants, BV, Rekken, The Netherlands*

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A major change has occurred in the way Web technology is being used in society. The change is grounded in user empowerment using Web 2.0 tools and processes. Students are already sophisticated users of these tools and processes, but outside of the mainstream instructional practices in higher education. In this reflection, the educational potential of Web 2.0 tools and processes is discussed, followed by three sets of perspectives relating to the potential quality of such practices in higher education course settings. For each perspective an analysis of key factors affecting the perceived value of Web 2.0 tools and processes is given, followed by suggestions for overcoming predictable barriers to uptake in mainstream instructional practice.

Les outils et les processus d'Internet 2.0 dans l'enseignement supérieur : une perspective de qualité

Un changement très important s'est produit dans la façon d'utiliser les technologies du Web dans la société. Ce changement repose sur la capacité qu'ont les utilisateurs d'employer les outils et les processus de Web 2.0. Les étudiants sont déjà des utilisateurs avertis de ces outils et processus, mais cela, en dehors des pratiques éducatives habituelles dans l'enseignement supérieur. La réflexion menée ici examine le potentiel éducatif des outils et processus d'Internet 2, le tout accompagné de trois ensembles de perspectives liées à la qualité potentielle de ces pratiques dans le cadre de cours universitaires. Dans chacune de ces perspectives on offre une analyse des facteurs principaux qui affectent la perception de la valeur des outils et processus du Web 2.0, le tout suivi de suggestions pour surmonter les obstacles prévisibles à l'adoption dans la pratique éducative courante.

Web 2.0 Hilfsprogramme und Prozesse in der Hochschulbildung: Qualitäts-Aspekte

Ein bedeutender Wandel ist in der Art erfolgt, wie die Webtechnologie in der Gesellschaft benutzt wird. Dieser Wandel beruht darauf, dass die Nutzer höhere Handlungskompetenz für Web 2.0 Hilfsprogramme und Prozesse besitzen. Studenten sind schon fortgeschrittene Anwender dieser Werkzeuge und Prozesse, allerdings außerhalb der gängigen Lehrpraktiken im Hochschulbereich. In dieser Betrachtung werden die pädagogischen Möglichkeiten von Web 2.0 Programmen und Prozessen diskutiert, gefolgt von drei Anlagen mit Perspektiven der potentiellen Qualitäten dieser Techniken in Hochschulkursen. Für jede Perspektive wird eine Analyse von Schlüsselfaktoren bezüglich der erwarteten Werte von Web 2.0 Werkzeugen und Prozessen angeboten, gekoppelt mit Vorschlägen zur Überwindung von Denkhindernissen bei der Umsetzung in die durchschnittliche Lehrpraxis.

Las herramientas y los procesos de Internet 2.0 en la enseñanza superior: una perspectiva de calidad

Un cambio muy importante ha ocurrido en la manera de aprovechar la tecnología de la Web en la sociedad. Este cambio está basado en la toma de control por parte de los

*Corresponding author. Email: Betty.Collis@Utwente.nl

usuarios para el uso de las herramientas y procesos del Web 2.0. Los estudiantes ya son usuarios expertos de esas herramientas y procesos pero esto ocurre fuera de las prácticas educativas habituales en la enseñanza superior. La presente reflexión examina el potencial educativo de las herramientas y procesos del Web 2.0 seguido por tres conjuntos de perspectivas relacionadas con la calidad potencial de esas prácticas dentro del marco de cursos universitarios. En cada una de esas perspectivas se ofrece un análisis de los factores claves que afectan la percepción del valor de las herramientas y procesos del Web 2.0, esto siendo seguido por sugerencias para superar los obstáculos a una adopción dentro de la práctica educativa habitual.

Keywords: Web 2.0; Web 2.0 tools and processes; higher education; quality; pedagogy

Introduction: learning in the Web 2.0 period

Starting in 2004, Web 2.0 became a collective term for a mass movement in society: a movement toward new forms of user engagement supported by Web-based tools, resources, services and environments. Just as the WWW in the first half of the 1990s brought a step change in how people communicated, amused themselves, organized themselves, and engaged in business, so also is a next step change seen to be occurring. *Time Magazine* responded to this step change by voting for “You” as the person of the year in 2006,¹ “you” being the users empowered by the tools and systems of Web 2.0 technology to take new forms of control of many traditional processes. Terms being used to describe these new dynamics include the Participatory Web, collective authoring and crowdsourcing. Phrases such as Users as Experts, an Army of Davids, and Power to the People appear throughout the *Time Magazine* issue as well as in many other forums. *Time* concludes its discussion of the new ways of working, collaborating, doing business, and expressing oneself by calling Web 2.0 technologies collectively “a tool for bringing together the contributions of millions of people and making them matter”. It calls the surge of energy and activity in progress in 2006 “a massive social experiment with no roadmap”. Just as much as technologies, the term Web 2.0 has come to stand for “a social phenomenon embracing an approach to generating and distributing Web content itself, characterized by open communication, decentralization of authority, and freedom to share and re-use” (<http://en.wikipedia.org/wiki/Web2.0>).

What are these Web 2.0 tools and services? The phrase Web 2.0 was first used in 2004, to refer to what is perceived as a second generation of Web-based services emphasizing online collaboration and sharing. There has not been a technical update to Web standards, but rather a surge of new ways in which the standards are being used.² Howe (2006-2007, p. 60) categorizes four general types of processes within Web 2.0 applications that reflect these ways of interacting:

- for sharing user-contributed content (“You make it”)
- for evolving community-developed tagging and organizational schemes (folksonomies) for large sets of user contributed content (“You name it”)
- for the development of content collections by the user community (crowdsourcing)³ (“You work on it”), and
- for finding not only objects but trends and overviews of contributions (“You find it”).

To Howe’s list can be added virtual world environments, in which users create the worlds and artifacts within the worlds that they are simulating and then interact within the virtual worlds with their newly created artifacts. Second Life⁴ is a major example in 2006 and 2007

of a virtual world environment that is increasingly being used to supplement real world environments.

User modification possibilities are common throughout all of these Web 2.0 processes. Openness is a main differentiator of the current uses of these processes compared to their earlier manifestations. The processes represent new ways of making, sharing and consuming digital documents where traditional gatekeepers of quality are being overlooked by mass user opinion.

Not surprisingly, predictions about the application of these processes for learning are already occurring. Alexander (2006, p. 33) for example predicts a “new wave of innovation for teaching and learning” with particular potential for educational uses of social bookmarking and Wiki⁵ tools. Trondsen (2006) predicts strong uptake of virtual worlds in corporate learning and notes a number of pilot projects underway in company learning contexts. Blogs⁶ and Wikis are seen as having particular educational potential. Downes (2004) identifies nearly 50 pedagogical uses of blogs in formal learning and although his research is addressed to school practice, the majority of the ideas could be integrated within higher education courses. Lackner (2005) provides a portal site with instructional uses of blogs. Mader (2007) makes available an extensive portal of educational applications of Wikis with case examples from higher education. Other examples include:

- Students working together to design and develop a Web-based resource environment for a local audience (see the example of Collis, 2006, with the *Brisbane Media Map*, <http://www.bmm.qut.edu.au/index.php>)
- Students create podcasts to explore course concepts, sharing the results of their work with their peers for feedback (Goodfellow, 2007)
- Students create e-portfolios with learner generated content and peer commentary (Barrett, 2006), seen by Downes (2006) as “the” generic educational application of Web 2.0
- Students collaboratively annotate a base document or image (for the latter, using hyperlinked pop-ups made with Web 2.0 Google *mash-up*⁷ tools, <http://www.java-world.com/javaworld/jw-01-2006/jw-0116-google.html>)
- Students create and share content via blogs and via images, audio and video
- Students save and share searches, using RSS feeds to analyze how a topic, idea or discussion changes over time (“One can imagine such a social research object becoming a learning object or an alternative to courseware”, Alexander, 2006, p. 40)
- Students contribute to build digital collections of resources which they further use as their own learning resources, by extending them, comparing and contrasting them, and identifying trends and issues which emerge from these comparisons (Collis & Moonen, 2006).

Thus the potential for the application of Web 2.0 tools and philosophy to lead to innovation in higher education clearly exists. And the students are ready for it. Without higher education institutions promoting it, students are making extensive use of Web 2.0 tools and processes to support their studies as well as for activities outside the range of higher education. In a recent study of students in UK higher education institutions (the JISC LXP Study; Conole, de Laat, Dillon, & Darby, 2006) the conclusions were that students already, on their own initiative, make the Web the “first point of call” for their self-regulated study activities where they, in sophisticated ways, find and synthesize information, integrated across multiple sources of data. Their use of Web 2.0 tools is “pervasive and integrated” and “personalized”. They are members of several Web-based communities of practice,

sharing resources and asking one another for help and assistance. They are developing “new forms of evaluation skills and strategies (searching, restructuring, validating) which enable them to critique and make decisions about a variety of sources and content” ... “The use of these tools is changing the way they gather, use and create knowledge ... shifting from lower to higher regions of Bloom’s taxonomy ... to make sense of their complex technologically enriched learning environment” (p. 6). Parallel to these sophisticated informal uses of Web 2.0 technology, the students are “frustrated ... because of the mis-use or lack of use of the tools” in the technology practices formally supported by their institutions (p. 95).

This mismatch between the affordances of technology and the uses made of it in formal processes in higher education has been seen before. The prediction that surges related to popular uptake of technology would lead to innovation in formal learning has been made before, particularly in the early days of microcomputers (late 1970s–early 1980s) and the time of the popular uptake of the Internet and the rise of the World Wide Web (early 1990s). The general result, however, has been that new pedagogical models and other forms of innovation in learning have not much characterized higher education practice as a result of these technology surges even though students became extensive users of technology in self-directed ways. De Boer (2004) for example, summarized the literature as well as international survey research in which he was involved by noting that Web technology in higher education was being primarily used for support of logistical processes rather than for pedagogical change. The current use of VLEs (virtual learning environments) or CMSs (course management systems) in higher education is dominated by their functionalities related to content and information provision, what Cann, Calvert, Masse, and Moffat (2006) call “filing cabinet” attributes. Not surprisingly, students in the UK when surveyed with respect to their perceptions of VLEs found them disappointing and typically searched outside the VLE environments using Google and other tools for self-selected learning resources (Conole et al., 2006). Thus the potential for pedagogical innovation through the affordances of technology is not (much) reflected in institutional practice.

Among the many analyses of factors that influence the use of technology for pedagogical change in formal education, common problems have emerged: the pedagogies, supported by new technologies, that could lead to innovation are not enough known to instructors, not enough valued, and are perceived by instructors as too difficult to implement in practice. Barriers related to mismatches with local culture and expectations related to what constitutes “quality” performance by both instructors and students are particularly important (Berge, 1998). Another barrier is the perception of technology as a “solution in search of a problem” in the formal education context. A president of a large US university made the observation that “people fail when they become enamored with the current round of technology, whatever that may be” (Merten, 2000).

Thus, what will happen in higher education in response to the surge of use of Web 2.0 tools and processes in society? Will a “filing cabinet” accommodation be found that exploits only the least innovative aspects of the processes? Or will this be the time that a breakthrough in terms of influence on pedagogical practice in higher education will occur? The purpose of this article is to reflect on the likelihood of Web 2.0 tools and processes leading to pedagogical innovation in practice in higher education. Given the lack of widespread pedagogical change in the past from technology surges, will the “You” who is the person of the year according to *Time Magazine* because of the user empowerment available in the Web 2.0 time period, have a role in higher education? The lens we will use for this reflection is one of multiple perspectives on quality.

Quality perspectives for higher education

Perceptions of quality are very important to the processes of higher education. Quality can be seen from many different perspectives. Quality in terms of processes in the European Higher Education Area relates to factors that influence transparency of requirements and mobility of students from one country's higher education system to another. Quality to the senior administrators of higher education institutions is also perceived in terms of the degree of acceptability of their programs and graduates to local employers as well as to accreditation agencies. Quality also relates to indices of international recognition for higher education, mostly in terms of research output rather than types of learning processes. Quality from the perspective of those representing a discipline or an educational program often has to do with quality of learning resources and curricula and the quality of the instructors as indicated by their external reputations in their research communities. Quality perspectives for instructors include the perspectives of their disciplines but also relate to recognition of their own performance: what impinges negatively on student responses to their courses affects the mutual impression of the quality of the course. For students, quality often relates to understandability and clarity: how well are the expectations of the course and its assessment practices indicated at the start of the course and reflected in the course as it unfolds? Transversal to these perspectives on quality are those of learning theorists or social-change futurists, who posit requirements for quality in higher education based on theories of learning and workplace transition or changes in society, generally intertwined with exploitation of the affordances of technology (see for example Nair, 2003). Thus there are many combinations of perspectives on quality in higher education. For pedagogical innovation making use of Web 2.0 tools and dynamics to embed itself in mainstream practice in higher education, these perspectives need to converge. Three perspectives will be discussed: instructional quality, institutional quality, and technology quality.

Web 2.0 and instructional quality

For Web 2.0 tools and processes to become embedded in mainstream practice in higher education, they must be seen as bringing added quality to instructional processes. This in turn involves several aspects, including pedagogical approach, instructional integration and support, and assessment. Underlying all of these are the philosophies of teaching and learning that instructors and students bring with them to the instructional setting.

In terms of underlying philosophies Sfard (1998) has identified two metaphors of teaching and learning which illustrate two philosophical approaches. One is the acquisition approach, the other the participation approach. Quality from an acquisition perspective places an emphasis on how effectively pre-selected learning materials are prepared or selected, transmitted, explained, and clarified. The burden for this quality rests partly on the textbook and study resources selected to support acquisition and partly on the teaching skill of the instructor. Key aspects of an acquisition approach to learning include knowledge, fact, concept, and attainment, the *having* of knowledge. The metaphor is similar to what Goodfellow (2007) calls an attendance metaphor for higher education: students attend on-campus classes, pay attention to the instructor, and attend to their studies. Quality is demonstrated to the extent to which students successfully respond to examination items at the end of the course, presumably related to the level of attendance. The participation metaphor in contrast as characterized by Sfard places the nature of learning in belonging, participating, communicating, becoming a member of a community, "the ability to communicate in the language of this community and act according to its norms ... The permanence of *having* (as emphasized by the acquisition approach) gives way to the constant flux of *doing*" (p. 6).

Social constructivism reflects a similar dynamic. Sfard stresses that both metaphors are appropriate for higher education and should be balanced in pedagogical practice; however, she also notes that the acquisition metaphor is predominant in practice. This identifies a first threat to the uptake of Web 2.0 processes in higher education as learning activities involving such processes align with a participation metaphor for teaching and learning rather than an acquisition metaphor.

Educational metaphors become expressed in instructional practice via the pedagogies employed in the course setting. Many pedagogies have been developed that are at least to some extent based on learning by doing and contributing, as a step beyond individual cognitive engagement during learning; collectively these might be called participatory pedagogies in which “methods of instruction are not only instruments for acquiring skills; they are also practices in which students learn to participate” (McLoughlin & Oliver, 1998, p. 39). A subset of these participatory pedagogies focuses on pedagogies in which the learner is involved in the contribution of at least some of the learning resources in a course or even in the design of some aspects of the course as he or she participates in it. These may be called participatory design activities in which learners take the lead in designing some of the course artifacts (Pieters, 2004) or may involve team projects in which the results are meaningful to users of the results outside of the classroom (Kearsley & Shneiderman, 1998). Collis and Moonen (2006) have elaborated many aspects of a “contributing student pedagogy”. Contribution-oriented pedagogies call for a shift in typical instructional practices. Pieters (2004) presents a conceptual framework for a learners-as-co-designers pedagogy that is built on principles of constructivism, moving from expository to discovery learning, from instructional designer- and teacher-control to increasing amounts of learner control.

Zurita (2006) has noted that such changes in pedagogy may not fit the expectations of the students, and thus may not be positively valued by them. She used an Activity System framework to observe a learner-as-co-designer pedagogy in action in a particular higher education setting. Within such a framework, quality is seen as consistency among six dynamically intersecting nodes of subject, object, artifact, rules, community, and division of labor (Nardi, 1996). She found inconsistencies in the activity system she observed, leading to a breakdown in system functioning. The major inconsistencies related to problems with using the technology involved in students working as co-designers of learning resources, problems in the pedagogy used by the instructor for managing the group work involved, and most fundamentally, problems in the expectations of the students themselves. They were “more prepared to have a teacher-centered course than a learner-centered course” ... and “felt uncomfortable” when expected to design learning materials for themselves and their peers (p. 6). The course was designed around a philosophy that was inconsistent with the implicit philosophy embedded within the expectations of the students. The students’ perception of course quality was different from that of those who designed the course. Quality, as seen in success in obtaining an expected outcome, from an Activity Theory perspective means that consistency among all aspects of an activity system needs to be achieved. When there are disconnects, the outcome of the system will not be as desired.

New forms of support are needed for students when contribution-oriented pedagogies are integrated into instructional practices. Pieters (2004) comments on the types of support that learners need in design situations: support related to the availability of procedural rather than declarative information, for motivation for the task, and for prevention of cognitive overload. Providing these sorts of support for a contribution-oriented pedagogy requires additional work for the instructor. Luca and Oliver (2006) and Collis (2006) show examples of the design of course resources and procedures that focus on providing support for the learner in

a contributor role. Luca and Oliver focus particularly on support for self- and peer assessment as part of a learning project in which students work as members of teams to design multimedia learning artifacts. Collis takes in the larger course perspective when planning support for the learners in their *Brisbane Media Map* project. She identifies five key layers of scaffolding needed to support the course: via course organization, technical architectures, the database-driven course-management system used by the students for their product, assessment, and staffing. For each of these, design decisions must be made in an integrated manner before the course in order to support students adequately in their co-design activities during the course.

Such new approaches will be difficult to mainstream into instructional practice. A familiar observation is that instructors are resistant to change and particularly to pedagogical change that requires the use of new technologies (Cann et al., 2006). Sanchez (2001) is among many who summarize key reasons. He notes an absence of clear references and pedagogical models, a lack of confidence, uncertainty in the light of change, and the idea that innovations cause more work and often bring problems in their implementation. Common to all analyses is the problem of time and management (Gervedink Nijhuis, 2005). Collis and Moonen (2007) expand on this when they discuss some of the issues affecting instructors who implement a contribution-oriented pedagogy in their courses: management burdens, assessment-related issues, intellectual-property considerations, mindset-change conflicts, and connecting all of these, time burdens. In terms of management issues, a key characteristic of contribution-type activities is that the instructor does not know in advance what the students will contribute. Thus, if the instructions given to the learners are not clear and explicit about what is expected, in terms of scope, origin, criteria, length, and presentation, the management burden for the instructor can become overwhelming.

Thus, the nature of scaffolding required from and for the instructor becomes increasingly complex as students become more and more responsible for contributing to their own learning resources. In response, the *Learning Designs Website* (<http://www.learningdesigns.uow.edu.au/index.html>) has been created as the product of an Australian multi-university research project to provide templates and guidance for instructors in the design and implementation of learner-centered learning activities. The provision of reusable templates for the design and management of contribution-oriented learning activities is a valuable contribution in that the execution of such activities is not generally given in detail in the literature (a conclusion made by Herrington, McLoughlin, and Oliver, 2002, based on a review of 32 articles relating to technology-supported learning projects).

Assessment is a major issue affecting the perception of quality of learning activities and a major barrier to the uptake of contribution-oriented pedagogies in practice. Cann et al. (2006) note that previous attempts to stimulate pedagogical change (in their case in the biosciences) via exploitation of technology have failed to succeed as expected primarily because of “the unwillingness of highly goal-directed students to engage with what was seen as a frivolous activity not directly related to assessment”. Thus contribution-oriented learning activities must be assessed, with the same concerns for validity and reliability as for more traditional activities. Luca and Oliver (2006) and Collis (2006) describe the planning, scoring rubrics, templates and other tools needed to support self-, peer, and instructor assessment within contribution-oriented learning activities. The templates of the AUTC Project on ICT-Supported Learning Designs all give extensive attention to the assessment practices related to each activity design template (see the example at <http://www.learningdesigns.uow.edu.au/exemplars/info/LD16/more/04Implementation.html>) where learning principles, learning activity descriptions, assessment percentages, learning supports and

learning resources are integrated in an overview of the assessment requirements for the learning activity being discussed.

Among the reasons that assessment is the major challenge in a contribution-oriented pedagogical approach is that by definition, there are no pre-determined “right” answers, but instead there will be different degrees of appropriateness on different dimensions. Students are, understandably, highly sensitive to potential ambiguities in grading and marking. The more open-ended or complex the contribution, the more conflict can develop around the grade. Grading of group work is a particular minefield; not only on the occasions where students did not all contribute to the group at the same level, but also in other cases where the group works together so closely that it is difficult to untangle what the individual may or may not have contributed. All this contributes to tensions about the quality of learning, from both the instructor’s and learners’ perspectives.

In summary, it will not be easy to embed Web 2.0 tools and processes within mainstream higher education practice. To increase the likelihood of this embedding, the following need to be in place:

- Both instructors and students must value an educational approach where learner participation and contribution are balanced with acquisition.
- A pedagogical approach must be used that reflects contribution-oriented activities where students create at least some of their own learning resources.
- The approach must be scaffolded in practice by interlinked support resources for both instructors and students. Uncertainty must be reduced as much as possible for the students in terms of what is expected of them, and to what standard.
- The processes as well as the products produced by the students must be assessed as part of overall course assessment practices.

The third and fourth of these recommendations are feasible in practice but will require considerable extra work for the instructor compared to traditional delivery practices. The second of the recommendations requires some creativity, particularly to translate the possibilities of Web 2.0 tools and processes to meaningful learning activities. But all of these can be gradually dealt with, given support such as the Australian Learning Design templates and more and more experience with Web 2.0 tools and processes outside of instruction. The first is the most problematic: changing perceptions of quality in teaching and learning requires a cultural change, away from attributes associated with effective deployment of an acquisition metaphor toward a participation metaphor. This cultural change is not likely to happen on its own, at least within a short-term basis. The institution’s and society’s perspectives on quality might have to change first.

Web 2.0 and institutional quality

There are at least four, potentially conflicting, perspectives on quality from the institutional perspective that can influence the uptake of Web 2.0 tools and processes in higher education practice. These perspectives relate to accreditation frameworks, expectations from external stakeholders, quality concerns relating to learning resources and experiences endorsed by the institution, and issues relating to intellectual property.

Universities are under increased pressure to demonstrate quality around common standards. European universities, as members of the European Higher Education Area, must now meet both national and European requirements for quality assurance (Bologna Working Group on Qualifications Frameworks, 2005). Although national frameworks can differ,

quality is generally meant to be assessed per institution along dimensions relating to procedures for the assessment of students, for the quality assurance of teaching staff, for the guarantee of quality of learning resources and student support, and for the effective use of appropriate information systems as well as internal and external procedures for monitoring quality assurance (European Association for Quality Assurance in Higher Education, 2005). Thus any move towards a co-contributor pedagogy supported by Web 2.0 technology must also be monitored within the quality assurance perspectives important to the institution as an accredited degree-granting organization. Quality assurance processes give particular attention to the institution's procedures for student assessment. The European Association for Quality Assurance in Higher Education (2005) notes that each institution must have student assessment procedures that have "clear and published criteria for marking" and "are subject to administrative verification checks to ensure the accuracy of the marking procedures" (p. 17). The same concerns that face instructors and learners relating to appropriate assessment of contribution-oriented pedagogies will also be felt by the institution when it has to defend the validity and reliability of assessment practices for such activities. Student criticisms of assessment practices are taken seriously in quality assurance reviews. If students feel negative about the quality of learning activities and the way their performance is assessed, this will negatively reflect on the institution.

Other than accreditation agencies, there are other external stakeholders whose views on quality affect the institution's response to pedagogical and technical change. Opinion leaders in society as well as in professional communities are often vocal in the media that higher education institutions should change, and should exploit technology in this change. An example is the FutureLab organization in the UK (http://www.futurelab.org.uk/about_us/index.htm), representing a consortium of universities, industry partners, and student organizations. Its researchers note the mismatch between the ways learners "own and/or can access a range of new technologies and tools and as a result are taking responsibility and exercising greater autonomy in more and more aspects of their lives beyond formal learning"... with the ways that educational institutions use technologies that "are based on outdated constructions about what it means to be a learner in the digital age" (http://www.futurelab.org.uk/research/handbooks/04_08.htm). Industry as well is challenging higher education to provide graduates with competences related to future workplace requirements such as flexibility, creativity, ability to handle IT tools and systems, ability to express ideas via a variety of platforms, ability to accept ambiguity, and team skills (Paulson, 2001). These perceptions of value are consistent with pedagogical approaches involving Web 2.0 tools and processes and could be seen as stimulants.

However, in contrast, there are other stakeholder perspectives that challenge the value of student-created or contributed resources. Those who supply universities with scientific content (library services, textbook and academic journals publishers, academic bodies, and researchers themselves) take great care with the accuracy and quality of the resources they produce. Traditional gatekeeper processes such as blind peer review are seen as necessary for the maintenance of quality standards. The risk that students will find and produce material that is inferior and disseminate this as evidence of the scholarly level of discourse at the university is a major negative factor confronting the uptake of Web 2.0 processes and underlying ways of working in higher education. Conole et al. (2006) note that "The increasing use of user-generated content in the form of sites such as Wikipedia is challenging the traditional norms of the academic institutions as the key knowledge expert and providers" (p. 102). One way of responding to this is to ban citations from user-generated content sources in student work. Some institutions go so far as to try to technically block access to resources such as Wikipedia (Downes, 2006) despite the fact that an ongoing study

comparing the accuracy of Wikipedia entries with online Encyclopedia Britannica entries on the same topics shows a similar (low) level of factual errors, misleading statements and omissions in both, at least on the 42 science topics that were the basis of the comparison (Giles, 2007).

This is a value problem that will not diminish for higher education or for society in general. Increasingly it must be the user who has the critical insight to decide on the quality of information and human contacts for knowledge sharing. The more than 10,000 Wikipedia “editors”, self-appointed and self-monitoring, are representatives of a radical change in the ownership of expertise in society. Higher education cannot ignore the implications.

A final issue relating to quality from the institutional perspective relates to ownership and intellectual property. The ideas of crowdsourcing and user-contributed and modified content present universities with a cluster of issues relating to the boundaries of intellectual property. The line between appropriate reuse of another’s contribution and plagiarism will require an organization-wide policy as well as models for practice. Institutions may be challenged on the quality and legality of learner-produced artifacts. The potential quality of an activity involving Web 2.0 tools and processes may be outweighed by the repercussions if institutions are increasingly embroiled in copyright-related confrontations.

Thus, from an institutional perspective the stimulation of Web 2.0 tools and processes may:

- Conflict with the innate conservatism of accreditation processes
- Lead to complex challenges relating to copyright and intellectual property
- Be seen by some as a reduction in the quality of experience provided by the institution.

But it can also:

- Be used as a strategy to respond to the vision and demands of key external stakeholders such as future employers of the students

To reduce the risk of the negative consequences and enhance the benefit of the positive, the following recommendations can be made:

- Stimulate a well-managed approach to the embedding of Web 2.0 tools and processes within course learning activities by providing support for instructors in appropriate management and assessment practices
- Stimulate an environment in which digitally literate students are supported and encouraged in their use of Web 2.0 tools and processes
- Develop institutional procedures and guidelines for use and reuse of learning resources, not only those from professional providers but also those contributed by the students themselves.

These recommendations are reflected in a more comprehensive way in one of the conclusions of the JISC LXP study (Conole et al., 2006) on learner practices in higher education:

HEIs (higher education institutions) need to conceptually change their perspectives and rethink their positions as institutions of learning within the 21st century media landscape. They will be required to respond to the ever growing body of personalised, handheld devices, which will allow users to access content in contexts which were previously not possible. This will require

rethinking not only how content is delivered to such devices, which may be distributed across wide networks and locations but also how students interact, contribute and repurpose this content within their communities and for their own ends. (p. 99)

Web 2.0 and technology quality

While it might seem that a technology perspective on quality would be most directly aligned with the use of Web 2.0 tools and processes, the technology infrastructure in a higher education institution may be a major barrier to implementation. VLEs or course management systems have moved into mainstream use in organizations but typically prohibit or make very difficult the possibility of students carrying out Web 2.0 processes such as building on and extending each other's contributions. Institutional IT policies may prohibit students from access to even their own work after a course has finished. Learning resources created for audiences outside of the course, such as those discussed by Kearsley and Shneiderman (1998) and Collis (2006) must be hosted outside of the VLEs, bringing technical challenges in terms of management and quality assurance. In addition, newly emerging Web 2.0 tools and systems will not be directly integrated into existing IT systems because of institutional IT management processes; if they are made available, even in institutions using an Open Source VLE, considerable time will elapse between pioneering attempts at usage and eventual institution-wide support. As an example of challenges to the existing IT processes in an institution when even one contribution-oriented learning activity is embedded in a course, Collis made the following requests to her university's IT services team for further implementation of the *Brisbane Media Map*:

Students need a well organized resource environment, in which the expectations of the course and appropriate support materials are available. They also need groupware tools, such as shared workspaces; tools for document version control and distributed annotation, feedback, and editing; tools that allow them to manage their own work-in-progress and at the same time make work ready for assessment accessible to peer reviewers and faculty before going public. They need tools to manage their shared agendas and for different forms of communication. They also need skills in communication via a web environment in terms of presentation design and user-interface considerations. In addition, students must be allowed admin or at least instructor-level access to certain areas of the institutional course-management system so that it is used more as a groupware environment than a course-presentation environment. (p. 6)

If Web 2.0 tools and processes become embedded in formal higher education instructional processes, these requests will multiply and place strain on the IT infrastructure and support services of the university.

An additional issue is the gap between the experience and skill sets of students and of instructors with respect to Web 2.0 tools and processes. While students are teaching themselves to be sophisticated users and members of distributed support communities making use of Web 2.0 processes, instructors are likely to need help in managing the tools or even in becoming familiar with them. IT services may be required to scaffold faculty in a new wave of "computer literacy" support, this time at the Web 2.0 level.

More fundamentally than technical issues, the underlying user-control dynamic of Web 2.0 processes runs counter to institutional IT services' perspectives on quality where orderly, robust and secure processes are highly valued. The two different generations of the Web represent two different ways of working with, and having control over, technology. Institutional IT units are likely to still be based on the first generation in terms of their orientation toward controlled and limited user access, while Web 2.0 is rooted in the dynamics of user control.

Recommendations from the technical perspective on quality are:

- Ensure the VLE supported by the institution can serve as support rather than a barrier to contribution-oriented learning activities.
- Observe student use of Web 2.0 tools and processes to identify potential usability problems and provide support to overcome these problems.
- Scaffold instructors in the use and management of some major Web 2.0 tools appropriate for support of instructional activities, such as e-portfolio platforms; Weblogs; Wikis; editing tools for podcasts, image, audio, and video content and social software for collaborative bookmarking and authoring.

Conclusion

Many factors influence the perception of quality in higher education. When the object of the quality focus is in itself evolving, as is the case with the use of Web 2.0 tools and processes, it can be predicted that inconsistencies in quality perceptions, even from those representing a single actor group, will result in barriers to successful implementation. The rapid uptake of Web 2.0 tools and dynamics in society at large is no predictor of a similar uptake in formal learning practices in higher education. Given the many mismatches in quality perspectives, as well as the difficulties in carrying out new pedagogies in higher education, it can, unfortunately, be predicted that the empowerment offered by Web 2.0 tools and processes will not be able to overcome the inertia in higher education institutions when it comes to the mainstream uptake of new views of learning facilitated by new technologies. Granted, it should not be technology that drives change or quality perspectives in higher education. However, changes in society are interconnected with technology, particularly network technology, and thus technology use needs to be significant in institutional quality perspectives. The many different kinds of communication, representation and collaboration tools collectively referred to as Web 2.0 that are now being used by learners of all ages and levels outside of formal education requirements are making such fast inroads because they offer effective ways to be heard, to connect, to find and share, and to build identity. The empowerment involved needs to be considered within higher education, or else the disassociation of “school” from the “real world” will grow.

But there is hope. The suggestions offered related to instructional, institutional, and technical perspectives on quality are based on implementation research and with planning and leadership can be acted upon in the university. But most fundamentally, a mindset change is needed. As a first step, organizations can stimulate this if participatory pedagogies and the effective use of technology for collaboration, co-designing, contributing, and learning from others are specified as quality criteria for internal and external learning assurance processes.

Notes

1. *Time Magazine*, 25 December 2006 – 1 January 2007, vol. 168, no. 26.
2. For an on-going discussion see the Wikipedia entry at <http://en.wikipedia.org/wiki/Web2.0>
3. With crowdsourcing, a job usually performed by an expert is “outsourced” to an undefined, generally large group of people in the form of an open call over the Internet.
4. <http://secondlife.com/>
5. Wikis can be thought of as a combination of Website and word processing document, with functionalities supporting cooperative authoring and reviewing as well as version control.
6. Blogs are Websites containing reflections, comments and hyperlinks provided by the author.

7. Mash-ups are applications that integrate customized data on top of a Google map interface, so that pop-up windows with hyperlinks occur when markers are associated with different locations on the map

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