



Social Media and Learning Environments: Shifting Perspectives on the Locus of Control

Abstract:

In the past, centralised technology departments had major influence over the choices of learning applications in higher education. With the emergence of freely available Web 2.0 and open access tools, instructors and designers have been given greater ability to customize e-learning. This paper examines the historical roots of the impacts of authority from centralised technology units to an emerging user-centric control over learning environment design in higher education. A case study is used to illustrate the potentials and pitfalls in this more decentralised configuration for both learning and organization.

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Introduction

While many discussions have ensued around shifts in publishing control to more contributory models with the evolution of the Internet, fewer studies have examined the impacts of open access tools in learning design (Craig, 2007; Bonk, 2009). Cost factors have increased institutional reliance on open source tools like Moodle or Sakai in universities, but such implementations continue the model of centrally-controlled learning resources aligned to traditional course structures and practices, cognitive and content focused outcomes, and instructor-centered strategies (Craig; Lane, 2009). The customizable, personalized, highly interactive, multi-sensory learning and communication digital environments envisioned remain more science fiction than reality despite emerging prototypes (Sandars & Haythornthwaite, 2007).

While many arguments have been proposed about the reasons for slow adoption of new technology-enabled practices in higher education classrooms, one less reviewed is that of institutional contexts and campus decision-making as it impacts technology-enhanced learning design.

As 'policy' has assumed an increasingly pivotal role in the educational system, a growing number of scholars have turned their attention to the process through which rules and regulations are adopted, and the consequences they have on teaching and learning. (Sykes, Schneider, & Ford, 2009, p. 1)

This paper examines the historical roots of centralised technology organization and policy and contrasts this with traditional structures of decentralised authority for curriculum design and development. As Weller (2009) notes, new technologies are propelling organizational changes that are antithetical to centralised IT models. "The first round of learning tools replicated the centralised model, but as the tools have become easier to use, and the methods for integrating them simpler, so this centralised approach seems less applicable" (Weller, p. 188), driving for a more bottoms-up policy environment.

The development of Web 2.0 sharing and social tools facilitate an emergent user-centric control over learning environment design in higher education. A case study of the use of social networking tools to supplement a centralised course management system (CMS) in teacher education is used to illustrate the potentials and pitfalls in this more decentralised configuration. Also discussed are the continuing issues of early adoption versus mainstream implementation of technologies in teaching. The impacts of authority emanating from centralised technology units that previously set limiting policies impacting classrooms are undermined by the new open technologies and widespread access to social networking. Through this examination, the technology policy process and trends in higher education are reviewed, particularly as these are emerging in North American institutions.

The Systemic Context of Educational Reform

Most would agree that overall, the impact to date of technology on the basic structures and practice of teaching and learning in higher education has been limited (Barone, 2003). In the past, centralised information technology (IT) departments had major influence over the choices of learning applications at schools and colleges because of costs and requirements of technical expertise (Privateer, 1999). A centralised IT organizational approach has resulted in a number of successes as a consequence of policies of increased resources and institutional support. Technology has been a huge administrative growth center in terms of expenditures and personnel over the past 20 years within higher education (Fernandez, 2008). Over several decades, faculty and student access to institutionally provided hardware and productivity tools has markedly improved along with implementation of the infrastructure required to support them. However, centralised IT policies also resulted in a one-size-fits all approach for such tools as learning management systems, conferencing software, and even content packages (i.e., Plato) typically running on institutional servers (Heterick, 1985). Few of the highly touted technologies predicted to bring about reform have been widely deployed and even fewer adopted in mainstream college classrooms.

The Centralised University

Many of the innovation dilemmas that arise in the integration of technology into classrooms in higher education are the same as those facing education more broadly and organizations in general (Kotter, 1996; Rogers, 2003). In particular, technology has an institutional context that impacts its adoption and uses.

Higher education is largely a centralised practice. Originally, in a physically bound system, this was of necessity. In order to gain expertise in a field it was necessary to go to the location of the experts and receive their knowledge. It made sense then to group several such experts together so many people could come to one place, hence the university campus....Nearly all of the modern attributes of a university flow from this centralised model. (Weller, 2009, p. 183)

From a faculty and student perspective, the major rationale for computing in higher education revolves around teaching, learning, and scholarship. However, the university's structure as an organization appears to have often been decisive in the directions for technology deployment, with a need for large-scale systems and a centralised IT department to support enterprise requirements necessitating security and stable operations (Craig, 2007; Privateer, 1999). The centralised IT unit typically functions in higher education as the locus for policy setting, strategic planning, and funding decisions for technology. Funding and focus on infrastructure were more likely to grow in support of record keeping and information management than increasing technology in classrooms or the curriculum. While computing labs improved and faculty got more computers over time, the largest funding and infrastructure growth was administrative. At its worst, centralised IT structures have been characterized as antithetical to innovation:

Rather than fostering a spirit of free inquiry and creativity, IT seems complicit in the promotion of "factory" models of education where innovation and exploration are sacrificed to automation, efficiency, and the codification of standardized business processes. (Fernandez, 2008, p. 8)

Barriers to Technology Adoption

From a systemic perspective, oft-cited barriers to large-scale adoption of technology in the classroom have tended to focus on either problems related to faculty teaching or the limitations of the technology, while downplaying the institutional structure and policy perspectives in which faculty work and courses are developed (Romiszowski, 2004). Barone (2003) noted that efforts to initiate technology in teaching were generally decentralised, "piecemeal and iterative," with results that were "occasionally significant but seldom systemic" (p. 42). Limitations of access, training and computer literacy, lack of evidence of effectiveness, the expense and dearth of appropriate educational software aligned with curriculum and specializations, past practice, and time pressures have been cited as obstacles to widespread use in teaching (Cuban, 1986; Dillenbourg, 2008). Commonly recommended and implemented remedies to increase technology impact include teacher training, incentives, and improved technical support, yet none of these have resulted in widespread adoption in higher education or the significant reforms envisioned.

Rarely examined in the literature are the tensions between centralised decision-making versus a highly individualized faculty culture of teaching in higher education which have direct effects on the deployment and opportunities for innovation and sustainability. In higher education, curriculum and teaching are the unique purview of the faculty. The implementation of teaching is typically a highly personalized activity realized within disciplinary specializations with their preferred pedagogies (Lin & Ha, 2009). This tradition is accentuated by institutional barriers to the transformation of teaching values and practices such as lack of rewards for excellence, limited resources for instructional design and development, unclear evaluations of quality, and conflicting goals for outcomes (Davidson & Goldberg, 2009; Luehrmann, 1989). Hershfeld (2000) pointed out that in the traditional university model, course development is done by individual faculty who both develop and teach a course, with no separate financing mechanism for most course design and; therefore, limited resources focused on major course improvement and redevelopment.

Policy from the Center

Because the cost of implementation is frequently high in the initial stages of an innovation, a revised model is needed as new technologies are deployed in course design and development. The decentralised and essentially non-budgeted process of curriculum in higher education is both a traditional faculty value and institutional foundation, so is not easily changed. This process is antithetical to the current funding processes, resource allocation, decision-making, and delivery mechanisms of centralised IT divisions where the major university technology functions are located and most centralised deployment for technology change occurs (Craig, 2007).

There is growing recognition that decisions about technology on a campus are ultimately academic decisions and have an impact on valued and respected campus practices, interactions, and conventions. The consideration of technology in isolation from other campus variables leads to unrealistic expectations and simplistic answers to extremely complex challenges, involving multiple interrelationships among issues, governance conventions, and key players. (Barone, 2003, p. 43)

With such centralised decision-making on technology resources, policies are frequently in place that impede both early adopters because applications are not available or not supported, while mainstream faculty may find institutionally provided tools do not fit their specific needs or there is insufficient support to overcome barriers to implementation. Heterick (1985) early on raised concerns about whether centralised computing could respond to the diverse needs of students, faculty, laboratories, and departments, but alternatively noted institutions had to be concerned with the "chaos of choice" (p. 48). Further, in some cases, decisions about the appropriate software for instruction are made with limited faculty input, and may privilege factors such as integration with existing systems, security, and vendor add-ons such as technical support or upgrades over ease of use and teaching requirements. A reliable and predictable operations mentality in central IT has also impeded institutionally sanctioned experimentation and ongoing "skunk works" where new tools can be tested and evaluated in actual classroom implementation.

Many of education's critics bewail the history of failures at shifting practice and to mainstream technology as an essential tool for teaching and learning in higher education. With the advent of freely available Web 2.0 and easily customizable open access tools, advocates now argue that instructors and designers have greater options beyond sanctioned applications for creating unique online learning environments that can vary to fit needs of specific classes and subject areas, with the potential for developing even more personalized and social spaces to accommodate individual learner style (Bonk, 2009; Weller, 2009). In fact, education critics such as Christianson, Horn and Johnson (2008) have proposed that such widespread external technologies are the leading edge of a disruptive and decentralizing force that will not only change but potentially eliminate formal education as we understand it today.

Is Social Networking Different?

As many experts have suggested, past efforts to incorporate more significant changes in teaching have been more focused on the technology than the appropriateness for learning. Evidence is lacking for effectiveness with most technology implementations coming far more quickly than confirmatory evaluations (Dillenbourg, 2008; Maddux & Cummings, 2004). With rapid changes in features and providers, it remains difficult to have full understanding of potentials of any technology. Teaching-learning initiatives in higher education have frequently been under-funded, poorly coordinated, and too rapidly moved to the next new high-prestige trend to be successful given the structural and cultural barriers in place. Further, there has been little agreement on what technology integration would be meaningful for learning in higher education, with a shifting target over the years (Romiszowski, 2004).

To suggest there have been no changes impacting classrooms would be incorrect (Barone, 2003). Beyond access and networking improvements in higher education, areas that have become ubiquitous are the use of office productivity applications like word processing and presentation software, the use of email to support student-faculty communication, and the common use of Web browsers to find online information (Gilbert, 2000). What is common to all of these is that they are not innovations unique to higher education but instead are tools that have become pervasive among computer users globally. History suggests change in higher education teaching and learning may be more a result of technology tipping points elsewhere given the multiplicity of institutional barriers. In reviewing technology innovation in education, Luehrmann (1989) suggested three criteria for these earlier successes that illustrate the resistance of higher education to sustainable reforms: up-front costs must be small; the system as a whole must not be altered; and a cadre of people must benefit as they need to be there to continue when the innovators have moved on.

To move beyond "least common denominator" practices requires not so much new technologies as an increased understanding of frameworks for teaching and learning within which technology affordances are reviewed. This understanding must be accompanied by support for early adopters followed by scaling-up investments for sustainability (Dillenbourg, 2008; Romiszowski, 2004). From this perspective, technology is not the driver but the opportunity from which teaching and learning strategies can develop and eventually evolve within a rich technological framework. Entering into this scenario is the recommendation from current advocates for the increased use of social networking. And with this call come the recurring issues of institutional policy and processes accompanied by uncertainty about why this reform will be different. These new tools now have the potential to revolutionize the teaching landscape but, if adoption is widespread, may also be expected to feedback on organizational and policy frameworks. In the following sections, a case study scenario of change will be detailed as a way to re-examine the status of technology and organization.

What are Social Networks?

With the growth and popularity of social networking external to formal educational settings, advocates have argued that these tools not only provide powerful affordances for community building in e-learning, but potentially are transformational technologies for higher education more generally (Hart, 2008; Mason & Rennie, 2008). While various public collaborative environments existed on the Internet as early as the 1980s, the emergence of social networking as it is best understood today arose with the massive commercially-supported sites early in this decade, including MySpace in 2003 and Facebook a year later. By mid-2009, these two Web sites had rapidly moved to the top five for Internet traffic in the United States, and within the top 11 internationally as reported by alexa.com.

Social networking sites (SNS) cover a wide range of online environments, with many formal definitions broad enough to encompass almost any Web 2.0 tool (Alexander, 2006). Rather than communities organized by topic, SNS are "structured as personal (or "egocentric") networks, with the individual at the center of their own community" (Boyd & Ellison, 2007). Studies of users of SNS have shown these sites have the capacity to increase social ties and interaction, provide an outlet for self-expression, and assist in helping with information seeking and task completion (Gallant, Boone, & Heap, 2007).

Potentials of Social Networking in Teaching and Learning

Social networking provides novel affordances for computer-supported collaborative learning (CSCL), particularly in asynchronous environments (Grant, 2008; Idris & Wang, 2009). In a recent report studying the uses of social software in the higher education, Minocha (2009) found that educational goals for employing SNS included initiating new ways of learning, giving control to students, providing transferable skills, supporting peer-to-peer learning, enhancing reflective learning, creating a digital identity, and fostering social engagement. The case studies reviewed showed multiple benefits in using SNS, including retention, socialization, collaborative learning, student engagement, sense of control and ownership, problem-solving and sense of achievement, visibility of artifacts created, integration of multimedia, adding novelty and excitement to the learning environment, overcoming isolation and geographic differences, and students' positive perceptions of the educator involved in SNS initiatives.

From a design perspective, these tools are well suited to provide a learner-centered orientation and support both formal and informal learning interactions seen as critical to community and collaborative meaning-making in constructivist learning. Further, the public and no-cost nature of these tools allows designers and instructors to incorporate them in post-secondary education without the restraints often imposed by institutional policy on what software or support resources are available for instruction, allowing freedom to mix and match to meet specific course objectives and pedagogical strategies (Boyd & Ellison, 2007; Grant, 2008). Others have advocated for the use of social networks in formal educational settings citing the prevalence of use by the current digital generation of students and their expectations for technology integration (Hart, 2008; Pence, 2007; Weller, 2009). However, questions arise about educational uses as a large-scale survey of students in the UK found that while they regularly used SNS, they were less enthusiastic about being required to use them in classes (Hartshorne & Ajjan, 2009).

Institutional Perspectives and Policy for Deployment

As noted in recent reports on the deployment of Web 2.0 tools in higher education, institutional supports are uncommon and most adoption of SNS for teaching has been at the individual staff level (Ajjan & Hartshorne, 2008; Armstrong & Franklin, 2008). Administrative uses of public networks like Facebook for recruiting and public relations have grown over the past year but classroom uses remain experimental.

Debates have raged about appropriate ways to deploy social networking services for instructional uses, renewing standing policy issues and faculty-IT staff debates (Sclater, 2009a&b). From an institutional standpoint, critics urge waiting until integration into extant course management systems software is available, while advocates argue that campuses should move more quickly to promote use of dedicated SNS tools. The former raise issues of security, common user interface, integration with other campus systems, software stability, and operational control, arguments noted above as common within central IT organizations.

The tools and resources at our disposal shape teaching and learning, and it's likely that faculty will choose to work with the tools that are grouped, readily available, accessible, and supported on campuses. These tools happen to be the instructor-oriented tools in CMSs and not new student-centered tools such as blogs, wikis, and concept maps only available outside of traditional CMSs. (Romiszowski, 2004, p. 18)

By contrast, advocates, most of whom are actively using social networking, suggest that the resources and multiplicity of offerings now available and often open-source or cloud-based options promote personal choice, customization, and student familiarity. They point to concerns about the often crippled implementations of tools that can occur when a new feature is added to old software.

The growth of a dynamic open-source movement, a wealth of innovative technology tools and the explosion of interest in social networking sites among a new generation of students suggests that our current LCMS model may be situated not at the center, but on the margins of a profound revolution in web-based applications. (Craig, 2007, p. 152)

At the more radical end, advocates argue that the goal should be personal learning environments that are student-centered rather course or instructor

focused, a feature unlikely to be found in a CMS mimicking traditional course structures and practices (Sclater, 2009). Since policy tends to give primacy to IT arguments and in the absence of proven evidence for effectiveness, few campuses have actively deployed or provided large-scale support for social networking in teaching to date.

A Case Study Example

Social networking is still relatively new in direct uses for higher education courses so its full potential is only suggestive rather than known. In a recent course implementation, social networking was deployed because it accomplished several design goals. As with the early stages of adopting any new tool, results met some objectives, were less than promising in other areas, and had unintended consequences both good and bad that support some of the claims of SNS advocates that this application will be different in the long term.

The case study setting was an online course on technology integration for current and prospective teachers offered through the education school of a large, public university. This course has a long history, over time has had many different instructors, both regular faculty and temporary lecturers, and has been continually updated and improved (Hoffman, 2008; Hoffman & Menchaca, 2008; Menchaca & Hoffman, 2009). Because of its continuous and multiple offerings, the course was ideal for a design-based research project in which new strategies are implemented and rigorously tested to understand how these impact the teaching and learning (Reeves, Herrington, & Oliver, 2005).

Design Considerations

In the summer of 2008, the course designer decided to test the use of a social network tool as part of the course. The need for a change arose from several issues noted in earlier student end-of-course evaluations and instructor feedback on the areas that remained problematic in teaching. One of the major concerns was very specific: students and instructors did not like the discussion tools provided in the CMS, one of the common criticisms of integrated packages. At the same time, earlier goals to increase participant presence had shown the importance of the forum-based user interactions through course discussions (Hoffman, 2008), making this a primary area of concern. Beyond the specific goals, the course designer had overall objectives of improving student learning outcomes and student satisfaction with the distance learning environment. While student evaluations of the course were excellent, written comments at the end of earlier courses indicated students still missed the immediacy and presence of the traditional classroom, felt more isolated despite excellent rapport with the instructor, and continued to prefer F2F settings over distance classes.

As a result of these goals, a number of options were examined to provide a better discussion board capability. Institutional barriers immediately surfaced as any attempts at getting a new tool deployed or CMS updates installed were rejected. It should be noted that as with all major CMS systems, improvements have since been developed to solve some of the problems identified in the needs analysis. But policies in place determine when upgrades can be made available, have no options for establishing early test platforms, and do not encourage early adopters to experiment with alternative configurations. Any change would come far too late for redesign of this course and with no assurance that future CMS versions would fully satisfy the objectives identified. Any solution would have to come outside of institutional supports, meaning a lack of technical assistance or funding for purchase or server space.

While in the past, finding tools would either have required purchasing a solution or developing something new in-house, the growth of large-scale, freely available Web 2.0 social media applications offered a range of options. As with any design vision, none met every criterion for the ideal discussion environment. Ning (<http://www.ning.com> ^[2]), which was being used in other contexts outside of courses by some faculty in the education school, emerged as the best choice (Hoffman, 2009). Not only did it have an easy-to-use threaded discussion Forum tool, but it added social tools such as profiles, "friending," comment entry, blogging, areas to share images and video, and more (EducauseConnect, 2008). Further, an instructor can create a private Ning space to limit membership to class members and restrict outsiders from viewing, something considered desirable as students explore new concepts and to avoid concerns by some about the posting of private information. Because Ning itself is very new SNS, limited peer-reviewed studies of its use in instruction are in print. Other studies of teaching use of social networks have been published (Mazer, Murphy, & Simonds, 2007; Minocha, 2009), while Ning education sites such as "Ning in Education," <http://education.ning.com/> ^[3], abound with testimonies to the effectiveness of Ning in teaching.

Results of Ning Implementation

Students were initially required to log into the course Ning using their real names, set up a profile page and post a picture of themselves, then respond to twelve discussion items over the semester, six of which required not only a response to the instructor-generated question but also written reactions to the answers of other students. The discussions were used for encouraging analysis of course readings, coordination on one group project, and peer review of draft assignments. The linking of responses to profiles and pictures personalized Ning discussions in ways not found in a typical CMS creating a more student-centered feel to discussions. These discussions supplemented content modules in the CMS, and several other Web 2.0 tools were used in completing course assignments.

Beyond these course requirements, all other uses of Ning were optional. Many students shared personal images and videos, wrote friendly comments on each other's profile pages, and a few tried out the included blog. Some students started their own discussion items, typically to share stories or resources that supplemented the course content or provided helpful technical tips for completing assignments. The course has been taught in twelve more sections since its initial offering in summer of 2008 with the inclusion of Ning. The patterns of use and interaction have been similar with some variation in the amount of non-prescribed or "back channel" social interactions occurring.

In terms of formal analysis of outcomes from the initial implementation, there was little evidence to suggest that student achievement improved although student self-ratings of learning increased. Typically students do well in the course and this continued, without evidence of improvements based on teacher observation, performance on required assignments, or course grade. But there was a positive shift in student perceptions as evidenced in the responses to open-ended questions from the student end-of-course evaluations. Uniformly, the students wrote about the importance of Ning and the social environment, indicating that personalization and knowing others increased their enjoyment, sense of involvement, and the friendliness of the course, all elements typically accorded to the attitudinal domain of learning, particularly motivation and engagement. A few noted that the interactions were as good as face-to-face classes, which surprised them, and two indicated that it was better. On the rating of preference for distance learning over classroom learning, two-thirds now rated distance learning as good as or better than F2F, a significant increase from earlier evaluations in classes without Ning.

Negative issues that arose in comments from students were the overload of postings which made it hard to keep up, and some initial confusion by a few about having to log into a different system from the CMS to complete required activities. Faculty found that reading long discussions and finding individual student responses for grading presented some challenges, as Ning was not designed specifically as a course tool, but this feature deficiency was also true in the CMS.

Perspectives on Social Networks and Reform

When considering social networks primarily as discussion forums, as was the initial goal in the case study, SNS have the potential to fit in well with current teaching practices focused on content learning and critical thinking as shown by the results above. In this case, implementation requirements included awareness of options beyond those officially sanctioned by the university, affordances matching the design requirements of the course, ease of use by faculty and students so that specialized training was not required for implementation within the course, and free access obtainable with basic user tools (hardware, web browser, network infrastructure). As noted from earlier studies, SNS are excellent tools for presentation, sharing, critiquing, and repurposing of information. As such, the SNS not only met learning and teaching needs but fit with relative ease into the existing decentralised process of curriculum design.

However, the greater impact as expressed in student comments was on attitudinal variables, an area that has often been less examined in higher education because of an emphasis on cognition (Craig, Graesser, Sullins, & Gholson, 2004). Students in the class felt connected, rated their learning as improved, and were motivated because class was enjoyable. Further, the personalization aspects made it possible to accommodate varied levels of sociability and non-class required interactions. As early as twenty years ago, there was recognition that many technology studies showed greater impacts on motivation rather than learning (Hudlicka, 2003; Isen & Reeve, 2005). As an alternative to a focus predominantly on objective content outcomes as a measure of effective course design, many are now suggesting a greater emphasis on learning environments and the ecology of learning (Sandars & Haythornthwaite, 2007; Zhao & Frank, 2003). This was most clearly expressed by Barone (2003), who noted that students today have changed outlooks:

Technology enables the design of learning situations that actively engage and guide the learner while allowing the learner to choose the style of the learning experience and to organize the knowledge outcomes. Conceptualization of the learning environment is transitioning from learning in a physical space—that is, the classroom—to a student-centered learning environment situated in cyberspace. (p. 42)

The use of expanded tool options beyond the institutionally sanctioned CMS allowed for a richer learning experience and met expectations for a more personalized experience that is increasingly a part of student's non-classroom online interactions.

Policies and Progress

While this case study is clearly within the early adoption paradigm, it shows potential for what a more mainstream future may look like. A key to the success of innovation in the case study was the selection of tools based on pedagogical needs and the ability to select from multiple options to customize the learning environment for this particular course and student body, rather than trying to make the technology fit (Romiszowski, 2004). In addition, the tools could be deployed with limited training or support for either faculty developers or student users.

Institutional policies in place provided little support although open networks allow such tool use as an individual faculty choice. A menu of tool options and customization, at least outside the institutional CMS, are not at the forefront of institutional policy priorities given that IT units stress centralization, standardization, support concerns, and system integration resulting in a commonality of tools. Further, there are typically no alternatives and few incentives offered internally for unique or experimental launching of emerging tools.

A further potential barrier to institutional support is that the effectiveness measures resulting were not the usual ones on student learning that sway policy makers. Higher education has given little emphasis to the affective in learning and its relationship to the cognitive aspects of learning (Jones & Issroff, 2005; Main, 1992). However, learning environments are increasingly being viewed as critical to the next generation of instruction. When learning is reliant on technology for delivery as in many e-learning or hybrid scenarios, tools primed for social and personal choices provide increased options for individualization and decentralization of the learning paradigm. It is in the design of environments where social networking appears to have the highest potential, and in the process of establishing new learning environments, altering existing relationships and power structures.

Opportunities and Conflicting Values

A global network environment with rapidly appearing and popularly advocated new social media tools allows faculty as the initiators of course design and delivery to have choices not previously available because of costs and access barriers. The emerging Web 2.0 toolkit offers a surfeit of opportunities for early adopters (Bonk, 2009), in contrast to earlier technology which was highly centrally controlled and deployed. With mounting evidence of affordances that are congruent with higher education objectives, values, and practices, social networking sites have great promise for becoming a future success as these grow to be ubiquitous outside of formal institutions and if local policies do not impede more widespread classroom adoption. However, as Heterick (1985) noted:

the decision to use a particular method of instruction is an individual one reserved to each faculty member, and getting a new method of instruction adopted widely requires thousands of faculty members to make individual decisions to use the new method [Emphasis in original]. (p. 402)

The challenges are great and the widespread acceptance of this technology still unpredictable because such adoption must initially occur in the decentralised zone of curriculum development and will tend to undermine centralised policies of institutional control over campus technology policies, not all of which are ill-formed. When it comes to wide-scale campus use, central policy may have initial utility as a guardian because issues of security, ownership of data, privacy, and software stability are meaningful concerns when deploying tools for critical classroom functions. Few faculty are able to comprehensively assess consequences in deploying newly emerging tools not sanctioned by the institution. The balance of priorities between innovation and risk is a difficult one, amplified by institutions known for their conservative organizational nature and values. If past experience is a guide, such policies may take on an overriding importance in evaluating open software systems once again elevating the divide between faculty-IT priorities and decision-making. Policies meant to protect can easily be seen as designed for control and protection of the status-quo.

But with the rapid evolution of a user-centered web that shifts the expectations of user participation in all areas of society, it is critical that institutions initiate a broader conversation on their organizational structure and the way they will operate in an increasingly decentralised landscape. (Craig, 2007, p. 160)

Conclusion

Just as a systematic and policy perspective broadens our understanding of technology uses in higher education, a systemic view of teaching and learning reveals that previous focus on content and information delivery are inadequate to understand what happens in courses. While the teacher lecturing in the front of the class is a vibrant and well understood stereotype, this mental image narrows the perspective on what has changed and

what could change in education as the instructional process is placed in a wider context and re-envisioned as a learning environment. In rich learning environments, student choices to explore, socialize, collaborate, and contribute create a more decentralised context for course content.

As the case study and literature review suggest, change is happening in terms of technology impacts on teaching and learning, and this shift goes beyond the more common arguments related to massive user-generated and expert content proliferating on the Web. The potential for loosening institutional controls over tool access, the rapid growth of social networking beyond college walls, and the decreasing costs for user training and ready-availability are suggestive that these new tools will spread like earlier innovations such as word processing and email as foundational tools for higher education. These new tools allow greater ability to design environments rather than content-focused containers for better and more personalized learning. These new decentralised learning paradigms are likely to have a feedback affect on organizational structures related to technology. Social networking can reinforce the power in bottom-up policy from faculty based on pedagogical needs rather than an institutional administrative focus.

Concerns such as those of Heterick (1985) around chaos of choice may be overstated but there is a potential for decreased stability as cultural norms and values readjust around decreasingly controlled and centralised IT policies. If anything, the future may be confusing with too many rather than the too few choices that characterized past institutional constraints on technology options and expenditures. The fact that new technologies may by-pass traditional policy structures and potentially undermine previous IT centralised structures while increasing options for course design is not in dispute. And such pedagogical shifts are likely to be accompanied by destabilization of what today are well understood higher education models (Weller, 2009). But could longer term shift have greater impacts on faculty influence and increase power of students when content and tools are no longer in the control of universities? While this paper focuses on decentralisation within current higher educational paradigms, others have proposed that decentralization will have broader effects.

Higher education will face a challenge: when learners have been accustomed to very facilitative, usable, personalizable and adaptive tools both for learning and socialising, why will they accept standardised, unintuitive, clumsy and out of date tools in formal education they are paying for? (Weller, 2009, p. 184)

While Christianson, Horn and Johnson (2008) make their case for the disruptive effects of student-centered learning envisioning powerful teaching software environments that promote self-engagement and self-selection of learning contexts, this paper has argued that social and community aspects of learning found within higher education are equally critical to long-term educational change (Brown & Duguid, 1996; Main, 1992).

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