New Educational Learning Environments: Riding the Wave of Change Instead of Having Crash Upon Us
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ABSTRACT
The environment of higher education is changing; we have new challenges and opportunities created by social media, streaming technology, access to learning materials, and pathways of acquiring and assessing knowledge and skills. This panel discusses forces of change and disruption to existing models of higher education and suggests means by which IT departments can leverage these changes. Each panel participant addresses a specific area, including technology-mediated learning, learning management systems, learning object repositories, ensuring quality control and accreditation, and how to successfully administer and manage these suggested changes.

Categories and Subject Descriptors
DK.3.2 [Computer and Information Science Education]: Information Systems Educations -- accreditation, organization, curriculum

General Terms
Management, Measurement, Documentation, Performance, Design, Economics, Reliability, Experimentation, Human Factors

Keywords
Disruption, change, learning management system, massive open online courses, learning objects.

1. INTRODUCTION
The outcome of this panel is to form an extended dialog between IT/computing faculty across the nation to formally explore changes to education and how to best capitalize on these opportunities. This panel will be the springboard for future work, and we believe this will be the first in a multi-year panel at SIGITE; future years will report on formal research and work among this group.

Since this panel consists of five panelists (rather than the typical four), we will present rapid position statements within two to three minutes for each participant and leave no less than 15 minutes for audience engagement and response. Since the goal is to spur discussion during the panel and create a formal ongoing dialog after the panel, the positions serve merely as a brief introduction to avenues of ongoing conversation.

2. POSITION: CHI ZHANG
Students of new generations are using media and technologies to communicate with new people and learn new things in new ways. It is commonly agreed that simulations, digital gaming, and social networking technologies provide powerful learning opportunities and advantages[3].

To better understand the challenges and opportunities that the educational institutions are facing, in addition to learning success mediated by technology, we may want to focus on the five essential components of learning powered by technology: learning, assessment, teaching, infrastructure, and productivity, as the National Education Technology Plan 2010 – “Learning Powered by Technology” calls [4].

Learning: Educators want to investigate how we teach to match what students need to know and how they learn. The state-of-the-art technology can be used to “enable, motivate, and inspire all students to achieve, regardless of background, languages, or disabilities” [4, p.x].

Assessment: Technology-based assessment can be formatively used to analyze and modify the instructional practices while collecting evidence of students’ knowledge and problem-solving abilities to determine what students have learned from work.

Teaching: The teaching model is shifted to a “connected teaching model”. Educators are well connected to the content and resources, to data and information for assessing engaging and relevant learning experience, and peers and experts for improving their instructional practices.

Infrastructure: Infrastructure includes “people, processes, learning resources, policies, and sustainable models for continuous improvement” [4, p. xiii]. An infrastructure for learning is always available to students, educators, and administrators regardless of their location or the time.

Productivity: Technology must be applied to implement personalized learning which empower students to take control of their own learning by providing flexibility on several dimensions, such as need-based learning objectives, content, different learning method and pace, and tailored learning preferences[4].

3. POSITION: JACK ZHENG
Traditional LMSs mainly support formal and organization-centered learning environments. With the advancement of Web 2.0 particularly on open content sharing and social networking services, a new generation of systems is emerging to facilitate teaching and learning. The new systems (or new features added to current systems) are expected to support newer teaching and learning environments as well as to impact the traditional administration and business models. What features of these
systems are desired, and how will they impact higher education? The following are some of the features I see of most importance.

Open: the traditional LMS is a relatively closed environment with restrictions on registration, access control, resource sharing, and long term availability. A more open environment is expected to interact with external resources and applications easily, and it should provide easy and flexible access and lifelong support.

Social: a social learning network is an open online learning community for learning, discussion, resource sharing, and collaboration. The new system incorporates common social networking features such as learner profile, learning progress update, cross-course forum, study group, special interest group, public learning material review, etc.

Flexible learning organization: traditional way of learning in higher education institutions is organized by rigid courses and semesters. The new system may need to support more non-formal and informal learning, and to provide corresponding recognition and assessment systems. Some features may include flexible learning units of various levels and lengths, knowledge map or learning path, and gamification which somewhat complements the formal credit system. This flexibility can greatly increase subject coverage and number of learning tracks, which is particularly true in the ever growing IT industry.

Personal learning environment: a personal learning environment is learner-centered. The system is expected to provide adequate self-service in a personal space where learners can store and manage their own learning materials, monitor learning progress, build resources and knowledge repository, all with lifelong access. Some pilot systems and services have emerged to build more open, social, flexible, and personal learning environments, including CourseSites, OpenClass, einstein.com, OpenLearning, CodeAcademy, etc. Most of these systems do not yet share a common understanding of open and social learning, and they vary greatly in features and structures. The evolution of the system also requires, and probably as a driving factor for, the change of the current higher education business model. It’s a challenge as well as an opportunity for the development and adoption of such systems in higher education.

4. POSITION: JON PRESTON

Modern students are immersed in digital content outside the classroom and are entertained by and learn from online videos outside the classroom. We propose that IT learning can be improved by leveraging smaller, more focused learning objects that take advantage of the best practices of engaging online media. Our pilot/beta learning objects heretofore consist of 5-15 minute videos that are very focused on one particular topic; the learning object also consists of pre-requisite requirements (linking it to previous topics to ensure learners are adequately prepared for the content) and assessment tasks to ensure the learner has mastered the content before proceeding to later topics. In the past, it was possible for a learner to pass a course without mastering all the topics; with this learning object-centered approach, each topic is mastered and we ensure a deeper understanding of all topics.

5. POSITION: BECKY RUTHHERFOORD

Some of the newer problems dealing with the new ideas and concept for education lie in how these newer concepts can be recognized and evaluated as “learning”. Phil Hodkinson, 2003 [2], states that “The challenge is not to, somehow, combine informal and formal learning, for informal and formal attributes are present and inter-related, whether we will it so or not. The challenge is to recognize and identify them and understand the implications”. The challenge to traditional formal learning involves understanding and evaluating of other types of student learning.

Prior Learning Assessment [1] addresses how possible college-level credit may be given to students who can show the achievement of student learning outcomes for a course. Other challenges include MOOCs (massive open online courses), military credit, certifications and similar types of learning. As educators in the IT field, we need to understand how these newer types of learning may be incorporated into our programs.

The other difficulty with the new informal, disruptive types of student learning involves how the accreditation community will view these types of learning. Whether it involves regional accreditation or program accreditation, such as ABET, we as educators need to be addressing these new ways of learning.

6. POSITION: HAN REICHGELT

Undergraduate programs have traditionally been structured as consisting of around 40 courses. This organization has a number of advantages. For example, it is easy to track student progress towards a degree. Also, limiting the number of times a course is offered creates economies of scale. Finally, it becomes relatively straightforward to give student credit for learning that took place at another institution through course transfer.

However, the course-centric organization also has a number of drawbacks. For example, students often learn at different rates and courses typically do not allow for this. So, a student who needs a little more time to master a concept early in a course is often lost when the course moves on to a subsequent concept that relies on the earlier concept. Also, courses typically have a number of different learning outcomes. When a student does not completely master all learning outcomes, we face one of two bad possibilities: Either we fail the student and force him or her to retake the course, including the material that he or she has already mastered, or we pass the student but then run the risk that he or she is not prepared in a later course as it relies on the learning outcome(s) from the earlier course that the student did not master. Finally, courses often require one to package up material that is not needed until much later in the curriculum. For example, many computing programs contain a course in discrete mathematics early in the program of study, even though some of the material is not really needed until much later in the program.

So, can we reorganize programs of study around a large collection of learning outcomes that a student has to master, rather than as a very small collection of courses that a student has to pass?

7. REFERENCES


