Connecting Health and Humans
K. Saranto et al. (Eds.)
IOS Press, 2009

doi:10.3233/978-1-60750-024-7-613

Creating Experiential Learning Activities Using Web 2.0 Tools and Technologies: A Case Study

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Abstract Learning is no longer an internal individual activity but occurs through networks and connections. The aim of this project was to teach online health informatics students to use Web 2.0 tools and technologies to form networks and connections through experiential learning assignments. Web 2.0 tools and technologies were evaluated using a criteria checklist prior to implementation for students enrolled in health informatics classes at the University of Kansas School of Nursing. Health informatics students have developed competencies using an instant message service, blogging, concept mapping, social bookmarking, and interacting a virtual environment. In the future, health care professionals will have to work in rapidly changing environments and keep abreast of new innovations and tools, learn to use those tools, and to teach others about the tools.

Keywords: Web 2.0, experiential learning, social software

Introduction

Learning is no longer an internal individual activity but occurs through networks and connections [1]. Siemens [1] maintains that learning in the 21st century is explained by the principles of connectivism, which entails:

- learning and knowledge are contingent on a diversity of opinions,
- learning is a process of connecting information sources,
- creating and maintaining connections is essential to continued learning,
- the ability to see links between domains, ideas, and concepts is a core skill,
- current knowledge is the intent of connectivist learning,
- learning involves making choices of what to learn, and
- learning can occur in certain technologies.

Development of networks, connections, and collaboration in learning is supported by the use of Web 2.0 tools and technologies. Web 2.0 is known as an improved version of the web with new functionality. The term was created by O'Reilly to define "a set of principles and practice that tie together a veritable solar system of sites …"[2]. Applications are made accessible on the internet rather than installing software on individual computers or private networks [3]. In most instances, Web 2.0 services are available free of charge and open source. Web 2.0 tools and technologies include: blogs, wikis, web-based email applications, social networking applications, concept mapping software like C-Map[4], social bookmarking applications, instant messaging applications, and other immersive technologies (such as Second Life [5]).

Web 2.0 applications employ the collective intelligence of multiple users to create, collaborate, share, remix, and repurpose content [6]. This combined knowledge is turning the web into a global brain [2] and develops through the connection of people with similar interests and knowledge as well as through the interaction of people with differing ideas and disciplines. Therefore, the aim of this project was to facilitate online health information students to form networks and connections using Web 2.0 tools and technologies integrated into experiential learning assignments.

Theoretical Framework

Online courses depend on engaged learners and faculty to be successful. The development of authentic assignments to assist the learner in developing informatics competencies for future work environments requires team work, real-time engagement, and tools that support this collaboration. Authentic assignments are based on principles of experiential education and learning. Experiential learning, as defined by the Association of Experiential Education, engages the learners in direct experiences and is grounded in the following principles: [7]

- reflection, critical analysis, and synthesis,
- self-directed initiatives, decisions, and accountability,
- active engagement in activities,
- relationships are developed and nurtured,
- results of learning are unique and are important in future,
- educator's role is to facilitate the learning process including spontaneous learning,
- outcomes from learning cannot be predicted, and
- learning includes discover form natural consequences, mistakes, and successes.

Method

Design: A search of the internet was conducted to select Web 2.0 tools and technologies for online health informatics students. Selection criteria were developed for the Web 2.0 tool and technologies. Easy to download and install, easy to use, easy to learn, able to provide feedback to the user, available free of charge, and has the capacity to support multiple users were the preliminary criteria. These were extended to include a global web-based platform, attractiveness, ease of navigation, and architecture that encourages user contribution[7].

***Selection and evaluation criteria for the Web 2.0 tool and technologies*:** All potential resources were evaluated using the Web 2.0 Criteria Checklist with Yes receiving one point and No receiving zero points. (Table 1) [8]. Ideally the Web 2.0 application needed to receive a score of ten. This was modified to nine as the 'attractiveness' criteria, while desirable, was deemed nonessential and highly subjective. Selection was made by the faculty teaching in the healthcare informatics program. As the tools were used and evaluated by students, the criteria proved to be sound. Implicit in these criteria is best practices for security and confidentiality of information

Results

The following Web 2.0 tools and technologies have been used by KU health informatics students. First, Windows Live Messenger (WLM) [10] was used to provide a sense of community, office hours, and team project support. All students sign up for an e-mail account that can be used by WLM and then add each other to their networks

[11]. When the student or faculty logs on to their computer, they become visible to their network. If a faculty member is online, then students may contact them with questions or observations. Students have been very respectful of faculty time and are not constantly messaging them. WML was selected as it enabled multiple participants in a conversation, thus enabling team work. In addition, the transcripts of the conversations may be saved as an .rtf file. All group work now requires a WLM file to demonstrate participation by everyone in the group. Students have been very supportive of this strategy as it demonstrates who participates and who does not.

Online students often have conflicting work schedules as well as live in different time zones which can make group projects challenging to complete. However, the informatics faculty has found that these challenges are mitigated using IM meetings. The assignments using IM help students gain skill at coordinating meetings across time and space.

Blogger [9] and Edublogs [10] were chosen for blogging in the informatics classes. Each has features that support the courses. Doctoral students used Blogger to share information about professional meetings, conferences, and workshops that they have attended throughout the semester. Blogger was used to demonstrate the advantages of professional networking regardless of an individual's location. Edublogs is used in health informatics courses where faculty members post discussion questions. Students are required to record their responses to the questions in the blog to maintain a dialogue with others in response to their postings.

Enthusiastic, stimulating, and spontaneous dialogues in the blogs has proved challenging. Initially, students required prompting by the faculty to complete required course assignments which involved blogging. More success in posting to the blogs has been achieved through discussion questions. Responses to the questions as well as the dialogue maintained by the students have been more lively and conversational.

Delicious [11] is a social bookmarking application used to share favorite web sites and those used in course assignments. Students bookmark Uniform Resource Locators (URLs) to their accounts as part of course assignments where faculty can look at the sites to determine appropriate use of the web in searching for information. Del.icio.us has enthusiastically been used by the online health informatics students and faculty who find that independence from a specific computer to find their favorite web sites to be very useful. Together, students and faculty benefit from a diversity of bookmarked web sites. Currently, students and faculty have amassed more than 900 bookmarks. Furthermore, the bookmarks can be tagged—the addition of search terms. These can then be shown as Tag Clouds—an innovative way to show knowledge an interest areas.

Developing concept maps as a team is another way to socially network. C-Map [4] supports the development of concept maps as both an individual activity and a group activity [4]. A team can log on at the same time and interactively create a concept map. Students find this application a little more challenging than the other applications. However, the activity does help them understand the notion of different mental models when designing information systems and applications.

Web 2.0 tools and technologies include immersive, multi-user virtual environments such as Second Life (SL) [5]. Informatics students are required to establish a user account in SL and create an avatar. An avatar is a 3-D representation of the student and allows the students to interact with in the virtual environment. Basic membership in SL is free. A basic membership entitles resident avatars to visit islands open to the public, to visit secured island by invitation, as well as join groups. The University of Kansas Medical Center (KUMC) owns the KUMC Isle. The KUMC Isle is restricted and therefore is only open to KU faculty, students, and invited avatars. Students engage in simulated learning scenarios in a synchronous environment, yet separate geographically. Students design an information system for the Jayhawk Community Living Center by visiting the Center and gathering user requirements. Students present their work to the class in the Conference Center where they can see and interact with an audience. Students present posters in SL in a simulation of real poster sessions at conferences, giving them a safe place to practice the skills of professional presentations. These Web 2.0 tools and technologies are used extensively in the health informatics courses.

Discussion

On the surface creating user accounts and learning how to use the applications when many of the features found in these programs are also available in the course management software may seem to be busy work. The educational purpose, however, is for the students to gain critical skills with working the Web 2.0 tools and technologies, form a network of health informatics colleagues, and develop informatics competencies. The future will require that healthcare informatics professionals work in rapidly changing environments. The ability to keep track of new innovations and tools, learn to use those tools, and to teach others about the tools is a critical competency. Knowledge of networking tools is critical for success. Finally, simulations have been used to teach and evaluate skills and competencies. Second Life provides the location for these simulations, especially with faculty and students located in different areas of the globe.

Acknowledgements:

Ben Digman, elearning support specialist, KU Department of Teaching and Learning Technologies, for his expertise with Web 2.0 communication applications and Second Life programming skills. Jenifer Brixey for her editorial review.

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