HIGHER EDUCATION: A WEB 2.0 WORLD OF COMMUNICATION, COLLABORATION, PARTICIPATION AND SHARING

Nikleia Eteokleous
Frederick University

Despo Ktoridou
University of Nicosia
Cyprus

Abstract

Web 2.0 tools and social networking are part of our daily life activities. How about transforming social networking to educational networking, through Web 2.0 tools integration within the teaching and learning process? Employing a case study approach, the paper examines students' perceptions and experiences regarding the use of Google applications as learning tools in three university courses. The results revealed students experiences and perceptions in using Google applications for academic and social purposes, providing valuable information in designing the prototype of the new to the University of Nicosia "UNICloud" — a blended learning environment aiming to meet student expectations and support evolving pedagogical approaches.

Introduction

The process of designing learning environments is of major importance in an era where technologies rapidly evolve, students needs in knowledge and skills development change and new teaching and learning strategies reveal. The justification to this is the delivery of the advanced technology students need by using the ever evolving Web 2.0 services and social networking that enable students, faculty and administrators to collaborate and achieve high quality of learning. Projects and services of the Web 2.0 family are in important part of our daily life activities, with social networking services regularly enrolling millions of people, enabling communication, collaboration, participation and sharing. What about enabling education too? Related recent studies revealed evidence that students can benefit in a variety of ways from the availability of a private 'university only' social networking system (Anderson, 2007; Bonwell, 1991). With the ongoing advances of technology, academic institutions that hope to successfully empower their infrastructures and technology assets will be employing a web-based blended learning environment design.

Given the above, the current paper integrates Google applications as learning tools to achieve specific educational objectives within three university courses. The paper examines students' experiences and perceptions regarding Google applications within an educational setting. Specifically, the study examines the following: amount and quality of interaction with classmates and lecturer; quality and quantity of learning experiences in a student-centered environment and the relation of the online tools to their course. This paper is the first phase of an ongoing project entitled UNICloud.

Literature Review

Web 2.0 Technologies in Education

The technological advancement in information technology and telecommunications resulted in the development of the Web 2.0 were users are Contributing, Collaborating, Creating — the 3C's (Ala-Mutka et al., 2009; Hargadon, 2009; Murugesan, 2009; Richardson, 2009). Web 2.0 sets the foundation of a new era of information searching and processing. Web 2.0 could be characterized as the revolution in the way the Web is being used. For many people Web 2.0 is deeply associated with the group of web-based services and applications like blogs, wikis, multimedia sharing services, content syndication, podcasting, and content tagging service which facilitate a more socially connected Web where everyone is able to add to and edit the information space (Anderson, 2007). The above mentioned Web-based services and applications reveal the foundation of the Web 2.0 concept, and they are already being widely used in the educational context. Actually, these services operate using the building blocks of the technologies and open standards that support the Internet. It is important to note that most of these applications are in use for a number of years now with some integration of new features.

Millions of people use various social networks, such as Facebook, MySpace, Twitter, Delicious, Flickr, LinkedIn, and Live Journal. Discussion forums, blogs, wikis, chat-rooms, electronic calendars, electronic documents (i.e., Google documents) are some of the Web 2.0 tools employed within the social networks. Having in mind the opportunities provided through the Web 2.0, and the changes in users' roles, the social networking can be transformed to educational networking. The Web 2.0 tools can be applied for teaching and learning purposes towards achieving educational objectives. Various researchers (Ala-Mutka et al., 2009; Hargadon, 2009; Murugesan, 2009; Richardson, 2009) argue that the new web will dramatically change the education of the 21st century. It will alter the way which students approach learning, the way which teachers approach teaching and learning, and finally the way of interaction and communication among students and teachers and the way which they learn from each other.

It is evident that recently, several companies come up with new ideas and applications and working on ways to extend existing services with some of them

providing services to the educational sector. Google is one of these companies offering Google Apps services providing independently customizable versions of several Google products under a custom domain name.

Google Applications in Education

The idea of the classroom being the only outlet for students to learn from and interact with faculty is outdated, as the development of out-of-the-classroom tools continues to skyrocket (Motschnig & Holzinger, 2002). Google applications for education are one of those tools offering constant enterprise innovation saving university's time, money and hassles of managing these IT solutions. For example, Oregon was the first state to get Google Apps, and managed to save about $1.5 million for e-mail, as well as cut down the budget in hardware and software upgrades since the OS is in the browser (Wolf, 2010).

The web-based application currently provides a set of customizable tools. Through these Google tools communication and collaboration among faculty, staff and students within the teaching and learning process are enhanced and individualized teaching and learning that addresses the needs of various students is easily achieved. These tools can be categorized in three groups: 1.) Communication — (hosted e-mail, shared calendars and integrated video chat); 2.) Collaboration — students and teachers can share documents online at any time and location via Google Docs and Google sites; and 3.) Customization — IT systems can be easily integrated with Google (Google Apps, 2010).

Student-Centered Learning

Student-Centered Learning (SCL) is a widely used term in the education literature. A student-centered learning environment allows students not only to choose what to study, but how and why that topic might be an interesting one to study, provide students the opportunity to be involved in their learning (Burnard 1999). Researchers (Bonwell & Eison, 1991; Johnson, Johnson, & Smith, 1991; McKeachile, 1986; Meyers & Johnes, 1993) suggest that if a student-centered learning environment is properly designed and implemented could lead to the following: rise of motivation towards learning with more positive attitudes toward the subject, greater retention of knowledge and deeper understanding.

Combining the Web and Student-Centered Learning

Online educational tools are particularly well suited to be used with the SCL. The reason is that they provide students with the freedom to search, explore, take initiatives, and become developers of learning material, having in mind the educational goals they set for themselves. The Web can be used to develop an e-learning platform, where student-centered learning is employed and the advanced technology needed is provided for faculty and students to collaborate and communicate in a totally different dimension, providing numerous learning opportunities and challenges. Such an environment enables teams of students to effectively work on a project, while becoming 'masters' of their learning, set

educational objectives for themselves and gather information they consider useful and necessary (Motschnig & Holzinger, 2002).

Academics and practitioners are continuously seeking ways to enhance, enrich their classes as well as motivate their students. Higher education institutions should focus on designing student-centered learning environments integrating Web 2.0 technology as tools within the teaching and learning process. Along the same lines, important is the application of student-centered learning within a web-based environment where students will be responsible for their own learning; get actively involved and participate in the learning process; the lecturer plays the role of the facilitator and information supplier; and students gain self appreciation during learning (Brandes & Ginnis, 1986).

Methodology

A case study approach was employed for the purposes of this study, collecting qualitative and quantitative data (Creswell, 1996). The methodology was divided in two phases: Phase I where students' interactions and experiences regarding Google applications environment are examined and Phase II where the data gathered from Phase I and specifically, students ideas and opinions provided essential evidence in developing the UNICloud — a blended web-based environment aiming to meet lecturers' and students' expectations and support evolving pedagogical approaches.

Phase I: First of all, the researchers integrated Google Apps in three undergraduate courses during Fall 2010: MGT 370, MIS 151 and COMP 150. User accounts and e-mails were available for all 100 students enrolled in the three courses. Lecture presentations and notes as well as case studies were initially uploaded on Google cloud and shared with students individually or in teams. For better improvement of student-to-student and student-to-lecturer communication and collaboration the Google-talk tool was set up for instant messaging, calling (VoIP), voice mail and file transfer. Additionally, the domain for the University with Google Apps Education Edition was set up and students' and lecturers' accounts were integrated and provisioned. A 3-hour training session on managing the following Google applications was provided to the students: mail, Calendar, Docs, Talk, and Sites. The goal was to train the students on how to use the aforementioned set of customizable tools so as to effectively communicate and collaborate with peers and lecturers and perform the course activities and exercises. After the training session all teaching material (lecture presentations, case studies, summary questions, problems, additional articles, white papers, research papers) were uploaded to the lecturer's account in Google Apps Documents. For all three courses, the lecturer was sharing the next day's lecture, the relevant real life case and/or the discussion questions/complex conceptual problems with the class. Students were assigned to perform various exercises and activities either individually or in groups depending on the topic and nature of the

exercise/activity. The students were also asked to report their findings in class using technology. When students were working in groups, it was required to use Google Talk to communicate, collaborate and share their work.

Phase II: Data collection process took place through ongoing classroom and web-based learning environment observations and focus groups.

Classroom and Web-based Observations

Through web-based and classroom observations the following were examined: the amount and quality of interaction with classmates and lecturers, and the use of the online environment for educational and social purposes. The above was achieved through quantification, involving counting the number and duration of logging into the system, number and duration of online talks, with peers and lecturer. More specifically, the lecturer monitored students' online activities that included student-to-student and student-to-lecturer communication, collaboration and sharing. Through classroom observations the lecturer monitored group and/or individual presentations/discussions as well as face-to-face communication collaboration and sharing.

Focus Groups

Three focus groups (one focus group for each course) took place as soon as the courses ended in December 2010. The participants for each focus group were chosen based on a number of criteria: age, gender, specialization, and educational background. Overall, 30 students participated in the focus groups (10 students in each focus group). On average, the duration of each focus group was 1–1.5 hours During the focus groups mainly open-ended questions were asked in an attempt to provide students with the opportunity to freely and openly express themselves on the subject under investigation. The focus groups were conducted in order to get insights and to analyze in depth the concepts under investigation from students' points of view (Kvale, 1996). Through focus groups the following were investigated: learning experiences in a student-centered environment, features and tools that the students would like to have in a blended learning environment in order to be designed based on their own needs and any recommendations for additional tools. More specifically**,** the focus groups targeted to investigate and explore students' views, experiences, and perceptions regarding Google Apps use and outcomes and also their interest for the development of a Cloud Environment for the University of Nicosia.

Analysis

The qualitative data collected from the observations and the focus groups was analyzed with the method of continuous comparison of data (Morehouse & Maykut, 1994). Classroom observations and focus groups aimed to evaluate the quality and quantity of the online learning experiences in a student-centered environment, and the interaction among classmates and lecturers; students' motivation and finally how the web-based environment was used for education and social purposes. Analysis through observations and focus group session were

integrated to explain the role of student-to-student and student-to-lecturer online communication/collaboration as well as learning experiences according to quality and quantity.

Data Analysis

Data analysis describes how students used Google applications to create academic and social identities. Specifically, students besides using Google apps in the context of learning they were allowed to create their own profiles, upload photographs and documents, create and join discussion groups, send messages and publish blogs and presentations. Based on the sample of the study the analysis of the results for Phase I focused on students' interactions and experiences regarding Google applications environment (see Table 1 below). More specifically students' use of G-mail, G-talk, G-Groups quantity, and duration of use were counted in order to examine the interaction patterns.

Table 1: Analysis of Results

Times Logged in (per week) Average per student	Logged in Duration (hrs per week) Average per student	G-Groups Participation (per week) Average per student		G-mail Messages (per week)	G-Talk Messages (per week)
1.3	2.2	0.3	Student-to-Lecturer	187	78
			Student-to-Student	230	356

The analysis of the results is categorized as follows:

Quantity of students' online activity: According to Table 1 students practically logged in the system almost everyday using used G-Talk (356 talk messages per week) to communicate and/or collaborate with their classmates more than exchanging e-mails. A noticeable student-to-lecturer communication with 187 e-mail messages exchange and 78 G-Talks is also evident since by monitoring students' online activities the lecturer guided the discussions. It is important to note that participating in a Group was not so interesting for the students since 0.3 average participations were counted.

Quality of students' online activity: According to records students found this environment convenient not only for learning purposes but for personal collaboration and communication. They found the environment user friendly and educating.

Online learning experiences through the web-based platform: Word processing, spreadsheets, and presentation application allowed students to work on the same document at the same time from anywhere at their own pace and at the same time have an online real-time communication. Collaborating in projects proved to be an excellent educational experience for the students in exchanging and sharing ideas improving their writing skills and at the same time learn how to work well with others.

Recommended features and tools for the web-based platform: Valuable recommendations were made by students for the design of the new Web-based environment. Students felt comfortable to express their preferences in suggesting tools that they wish to be included in their new learning environment: online Chat, links to Facebook and Twitter, wikis, translators, dictionaries, maps, weather forecasts, and online games. The data gathered from the three focus groups revealed that Google Apps was a motivation for students to learn since they had the advanced technology tools they needed. The justification for the amount of time spend online lies on the fact that students found this way of learning attractive, challenging, beneficial and convenient since they could have ubiquitous communication. More specifically they provided the following comments: *"An attractive and challenging way to learn"*; *"I am flexible to study anyplace anytime anywhere"*; and *"This course is challenging and forced us to learn to explore/discover/analyze/present individually and/or in groups. . ."* It is important to note that a comment that came from many students in all three courses showed that the 7GB of free storage offered by Google Apps was extremely convenient for them to upload and organize all their work for all their courses online. Some of the comments provided to support the above were: "*I am using my 7GB of online storage for my other courses," "7GB of online storage was everything needed, no more USBs,"* and *"Just excellent to have ubiquitous access to my work."*

Students expresses satisfaction in using the communication tools G-mail, G-Talk and G-Groups not only in sharing and collaborating with classmates but felt comfortable and confident in discussing their problems, ideas, and concerns with the lecturer. The online learning environment revealed to be a bridge of communication between the lecturer and the student. Students reported the following: *"It was more convenient to communicate and share with classmates' project issues*"; "*I feel more comfortable and confident in collaborating with my lecturer"*; and *"I felt very comfortable to contact my lecturer and share a personal problem that was an obstacle for my learning."*

Learning experiences proved to be beneficial for students. Such an environment exposes students to responsibilities towards their learning. Having to work in groups students learn to share/exchange/argue, respect the members of their group and conclude to a common solution to a given problem. Some of students' statements that support the above comment are the following: "*It was the first time that I felt I had a choice for my learning"*; *"I felt more responsible for my learning"*; and *"Group work helped me to learn to share/exchange my views and come up with solutions to given problems."*

Some students, though, expressed concerns on having to work alone without the presence of the lecturer. Lack of confidence was evident from their comments: "*Working online is not convenient to me since I do not have a PC at home"*; *"I cannot work alone, I prefer to be in class with my classmates and lecturer"*; *"I spend more time to finish an assignment online than using the traditional way"*; *"It is too complicate for me to work in such online environment, I do not feel I know so much"*; *"I do not feel confident to explore/discover/analyze/present alone"*; and *"I do not know how to approach the case studies and analyze them alone."*

It can be suggested that the collaborative nature of Google Apps for Education appeared to be a perfect fit for the lecturers' institution, allowing students to remotely work on collaborative assignments. Additionally, it is supported that a student-centered approach employed in a blended learning environment, it is highly possible to lead to students' increased confidence and motivation towards learning. Finally, the outcomes on the exploratory research on student perceptions on using Google applications environment provided evidence to the researchers to develop the prototype of the new blended learning environment UNICloud for the University of Nicosia. The system will have a simple and intuitive user interface where even students with limited IT skills can easily log-in, navigate and work with others. The following set of customizable tools were integrated: online Chat, links to Facebook & Twitter, wikis, translators, dictionaries, maps, weather forecasts, and online games. The majority of them were recommended by students. Having at the disposal the aforementioned customizable tools, faculty, staff and students will be able to effectively collaborate through a new learning environment, meet their learning goals and break down of communication that might exist in a traditional classroom environment.

Based on the above, it is evident that all three categories of Google tools (Google Apps, 2010) should be integrated within UNICloud: 1.) communication tools such as hosted e-mail, shared calendars and integrated video chat in order to enhance discussions, 2.) collaboration tools in order to promote remote document sharing among students and lecturers at any time and from any location and real time collaboration, and 3.) customization tools in order to make sure that students needs and demands are addressed, and a safe and secure environment for the university community is provided.

Conclusions

The results provided evidence to the researchers to infuse student ideas, integrating their energy and talent into the prototype design process of the new to the University of Nicosia UNICloud — a blended learning environment aiming to meet student expectations and support evolving pedagogical approaches. This system will enable students, faculty and administrators to communicate, collaborate and share in a secure cloud environment.

This educational experience proved to be beneficial for students in sharing ideas, raise diverse learning issues and most importantly successfully collaborate with their peers and lecturers in a different environment. Uniquely equipped Google Apps provided more resources for the lecturer to monitor students' online communication, provided feedback to shared lecture presentations as well as students' queries through Google mail messages. Quality learning experiences for lecturers and students it is possible to be provided through a blended learning environment where a student-centered approach is employed. The majority of the students characterized the course challenging and the learning experience valuable. Online communication and collaboration, where knowledge thoughts and ideas are shared was a vital part of the course. The lecturer played the role of the facilitator came closer to the students through while they were exploring and trying to solve given problem.

Finally, further research will be conducted where the recently developed UNICloud system will be tested and evaluated based on various parameters (i.e., technical and educational issues, students' and lecturers' opinions based on ease of use, and usefulness of use).

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