Designing Web 2.0 Collaboration Tools to Support Project-Based Learning: An Activity-Oriented Approach

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ABSTRACT

Collaborative learning involves small groups of students working together to solve problems for the purpose of learning. There are a large number of researches that focus on the technical aspects of computer-mediated environments for collaborative learning. Very few studies have examined the design of Web 2.0 technologies to support collaborative learning using an activity-oriented approach. In this study, activity theory was used as a design framework for collaborative learning in a Web 2.0 environment using Google Applications technology. By employing an activity-oriented design method, a collaborative platform was developed to facilitate social learning activities that are mediated by artifacts and collaborative tools using Google Applications technology.

Keywords: Activity Theory, Collaborative Learning, Computer Mediated Environments, Google Applications, Web 2.0 Technologies

INTRODUCTION

Web 2.0 is commonly defined in terms of features incorporated in social software, social computing and the participative Web (O’Reilly, 2005). Social networking systems have become popular in the past few years. Today, young people are spending a lot of their time online, using social networking systems to express their views and meet with friends. Social networking sites are Web-based services that allow individuals to share connections with others, based on relations established with their public or semi-public profiles. The tools and techniques which enable social networking (Web 2.0/3.0, cloud computing, blogs, wikis, social tagging, etc.) (Boyd & Ellison, 2007; Greenhow, 2009) are now gradually being adopted by the corporate sector as Enterprise 2.0 (McAfee, 2006), an approach which appears to be gaining momentum in at least the more far-seeing organizations.

Social tagging, wiki editing, file and media sharing, social networking and blogging are the most well-known practices used in Web 2.0
technologies. The common thread they share is that they all provide means of expressions for shared, distributed information and knowledge using social sharing tools. Social software technologies also play an important role in supporting learning and knowledge sharing process because they provide the opportunity to develop shared knowledge construction, meta-cognitive reflection and knowledge production. Through social tagging, members of a community define the links between resources together with the terms used to describe them. This bottom up process of knowledge sharing forms the basis of the “folksonomic” classification method.

Various researchers have emphasized the need to rethink learning in line with the new developments in Web 2.0 technologies (Markless, 2009; Ravenscroft, 2009). With the increasing popularity of Web 2.0 technologies, students become “digital natives” with different social skills. The Internet is often used for socialization rather than just for information searching. Unlike formal learning environments, which emphasize on academic norms of using externally-validated information, students prefer use of wikis and social software tools and facilities for creating user-generated contents collaboratively (Markless, 2009; Markless & Streatfield, 2007, 2009). While traditional information skills emphasize on using libraries and finding primary sources as sequential processes, the “digital natives” increasingly use the Internet for socialization, and information seeking is often performed via peer groups and communities of interest (Wenger, 1998). Therefore, a new learning environment is required to support learning, and to exploit the capabilities offered by the new generation of Web 2.0 technologies.

BACKGROUND OF THE STUDY

Collaborative environments in education involve small groups of students working together to solve problems for the purpose of learning. Google Applications (Rienzo & Han, 2009) consist of a set of tools developed by Google to facilitate collaboration. They incorporate features found in traditional office applications, as well as providing a common, shared space for collaborative work. There are three main applications provided by Google that facilitate collaboration: Google Docs, Google Forms, and Google Sites. Google Docs technology serves as a common platform for sharing documents in Google accounts. Google Forms provide a kind of spreadsheet document that can be used for developing online forms and surveys. Google Sites offer the tools for developing Web sites for collaborative work, handling documents, managing updates and wikis, and hosting forums for discussions. The Google Applications platform was introduced at the Hong Kong Polytechnic University to be used for courses involving collaborative projects in an undergraduate course. To enhance students’ effectiveness in using this collaborative technology, the current study investigates the relationship between Web 2.0 tools and education involving collaborative projects. In greater detail, this study aims at developing a design framework for collaborative learning using Google Applications Technology. To avoid overgeneralizations, this study concentrates on the development of design frameworks for collaborative learning environments in a given course context, where the consequences of design changes can be analyzed in-depth by the researcher.

PROJECT-BASED LEARNING

In this study, the research problem focuses on the application of project-based learning at the BA in Marketing and Public Relations program at the Hong Kong Polytechnic University. The main pedagogical principle with the design of the program is shaped around project-based learning (Blumenfeld et al., 1991; Hardless, Lindgren, & Schultze, 2007; Helic, Krottmaier, Maurer, & Scerbakov, 2005). Each subject in the course also includes a significant group project as part of the coursework assessment. In this study, we introduce a computer-supported collabora-
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