

# A CASE STUDY OF USING WEB-BASED TOOLS TO SUPPORT POSTGRADUATE STUDENTS' LEARNING IN A BLENDED LEARNING ENVIRONMENT

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## **ABSTRACT**

*This paper explores the implementation of Web-based tools in postgraduate students' courses and concentrates on students' participations and perceptions in such a blended learning environment. In this study, the focus is on the problem of how postgraduate students use web-based tools for learning support. Moreover, the writer discusses the factors that influence students' use of web-based tools in the learning process.*

## **KEYWORDS**

*Web-based tools, Learning support, Blended learning*

## **1. INTRODUCTION OF WEB-BASED TOOLS**

The effective use of technological tools enables students to construct knowledge in an active way, shifting 'from didactic techniques to a unifying constructivist framework' [1] [2]. Due to the rapid pace of development in computer technology and the Internet, there are a wide range of web-based tools which provide multiple learning materials as well as a range of possible teaching formats in teaching and learning. Kirkley and Kirkley [3] argue that designing blended learning environments is a challenge since we simply incorporate a wide range of tools in the learning process. Considering the difference of design purpose, function and complexity in web-based tools, there are two categories: learning platform and personal learning tool.

A learning platform is a computer software (or computer system) integrating tools and services to support teaching and learning, particularly for building a virtual learning environment [4]. There are other terms used in previous articles, such as e-learning platform (or system), online learning platform, and virtual learning platform, which present similar meanings. There are various learning platforms, such as Blackboard, WebCT and Moodle, with different user interfaces and functions. This paper explores the WebCT, one of the most successful and widely used learning platforms (or systems). It has developed quickly in 15 years from 2 million users in 30 countries to over 10 million students in 80 countries for online learning.

A Personal Learning System (or tool) is defined as computer software that mainly helps students manage their own learning, which can be viewed as a single and simplified learning platform [5]. Van Harmelen [6] points out that Personal Learning Systems (PLSs) may help students' set their own learning goals, manage their learning and communicate with others in the learning process. Actually, the personal learning tool is a new term which still has no unified definition.

The most frequently used personal learning tool in this study was PebblePad. PebblePad is an e-portfolio, providing electronic evidence such as text, images, multimedia, and hyperlinks. Actually, the designer indicates that PebblePad is a personal learning system, much more than an e-portfolio [7]. PebblePad supports personal learning, facilitating students' reflection on their own learning and needs. Compared with WebCT' preset framework interface, PebblePad is developed with a Flash user interface which is more customizable.

## **2. RESEARCH SAMPLINGS**

For this research, a case study was performed within the context of the master courses at the University of Birmingham. The goal was to assess postgraduate students' perceptions of the use of Web-based tools in the learning process. The two sample courses, 'Online and blended learning' and 'ICT in society', both belong to the 'IT in Education' program.

A maximum of eleven students participated in the 'Online and blended learning' course, and eight students in 'ICT in society' course. Among these participants, four full-time students participated in both of the modules. They are all international students who speak English as a second language.

In the 'Online and blended learning', all the participants had previous experience of using ICTs in study. All of them replied that they had used e-mail, BBS, Chat and weblog before, and five of them had used WebCT. Relatively, four part-time students in 'ICT in society' were more familiar with these ICT tools because they also work in primary and high schools and have much more work experience on education and ICT, thus helping them to better understand tutors' instructional design and requirements.

## **3. FACTORS INFLUENCING STUDENTS' USE OF WEB-BASED TOOLS**

### **3.1 Previous Experience and Technological Skills**

Students' previous experience and current technological skills impact on students' preferences in selecting web-based tools. Kennedy et al. [8] argue that previous positive experiences with technology and previous skills with technology are two main factors which affect students' use of technologies for educational purposes. Some past studies indicate that experience with technologies may enhance students' performance in the class and suggest teachers need to consider students' backgrounds and previous knowledge when choosing tools to form a learning environment [9]. People who spend more time online or are frequent net users or have been using the net for a long time will have better online skills such as searching for information or using online communication, thus they are more likely to acquire better knowledge. This idea is demonstrated in many previous studies [10].

In this study, all the participants are familiar with the Internet and computer and usually use them for learning and entertainment. Moreover, all the participants have basic experience and knowledge of CMC tools such as BBS, Chat, Email and Instant Messaging tools like MSN. These commonly used CMC tools are unappealing for participants. Compared with these tools, some innovative tools are more attractive to students. For example, participants give a high rating to the Whiteboard tool embedded in the WebCT. When students discuss online, they may use it to draw objects, enter text, import images and share these outcomes with others in real time.

### **3.2 Self-efficacy**

Students' self-efficacy also influences their use of web-based tools in the blended learning environment. Self-efficacy is a measure of individual's confidence in his or her ability to 'perform the behaviour required to produce a specific outcome and it's thought to directly impact the choice to engage in a task, as well as the effort that will be expended and the persistence that will be exhibited' [11]. Self-efficacy has been shown in several studies to influence students' choice of whether to engage in a task and performance in the process [12].

Computer self-efficacy is regarded as a specific self-efficacy, particularly related to one's capability to use computer technologies and the acquisition of computer skills [13]. Previous computer experience contributes to students' believe that web-based tools and computer applications are easy. High self-efficacy, in turn, increases students' persistence in learning web-based tools. In fact, self-efficacy and previous experience permeate and interact with each other, help each other forward, and affect in the whole learning process.

In this study, students' self-efficacy is as important as their previous experience and computer skills in facing the challenge of using new ICT tools. In the 'Online and blended learning' course, the lack of self-confidence becomes a barrier to participants' success. Some participants just audit this course and give up the final task which is to design a Web-based Instruction site. One participant told me designing a WBI site looks 'difficult' and 'I am afraid I can't finish it'. However, participants with high self-efficacy maintain a positive attitude to meeting challenges. As the students gain more self-confidence, they move into a more autonomous phase of collaborative learning [14].

### **3.3 Computer Anxiety**

Computer anxiety is the third factor relating to students' perceptions about the use of web-based tools. Computer anxiety is defined as "the tendency of individuals to be uneasy, apprehensive, or fearful about current or future use of computers"[15]. Computer anxiety is regarded as an individual characteristic that plays a critical role in shaping perceived ease of use about new systems and computer tools, particularly in the early stages of users' experience and adoption [16].

Buche, Davis and Vician [17] indicate that at least a change of high-anxiety individuals' computer anxiety to a lower level can change their performance. Matsumura and Hann [18] argue that students with low computer anxiety feel more comfortable and may get better achievement than their high-anxiety peers who always feel worry about using computer and tools.

In this study, participants showed low computer anxiety because most of them were familiar with computer technologies and some participants even taught this subject in schools. Participants in other majors without computer-related backgrounds were more likely to become anxious when learning new web-based tools.

When participants discussed new functions, the high-anxiety students would make more negative comments like 'hard to use' and 'I don't think it's useful'. Maurer [19] points out that the effect of computer anxiety affecting academic achievement can be overcome by other factors, such as students' motivation, good instructional methods and materials. In addition, students who practice and use web-based tools in a relaxed and fun-filled environment may reduce their computer anxiety [20].

Tutors in this study offered detailed instructional materials and set realistic goals for learning new systems. As the study went further, the high-anxiety students became more relaxed and held a more positive view of the new tools. The situation in this study seems to support the idea that computer anxiety can be significantly reduced in a long-term and sustainable study, especially in the second half of the term [21].

## **4. THE USE OF WEB-BASED TOOLS FOR LEARNING SUPPORT**

### **4.1. Support Collaborative Learning**

As one of the most popular learning platforms, the WebCT not only allows teachers to create and host courses on the Internet, but also offers a collaborative learning environment for students. Communication tools integrated in the WebCT are used for building both asynchronous and synchronous interactions. Our participants used these tools to exchange opinions, feedbacks, and comments and ask questions in and out of classroom. There were two frequently used communication tools in the WebCT:

(1) Chat room: The Chat room is a synchronous communication tool which allows students in the same course to chat with one another in real time. It also has the Whiteboard function which can be used to draw objects, enter text, and import images at the same time.

(2) Discussions: The Discussions is an asynchronous communication tool which allows students to post messages and replies on specific course topics or discuss tasks and group work with instructors, teaching assistants, and other students. Specifically, there is a type of Discussion called 'Class blog'. The 'Class blog' is a more collaborative space, where students may post a chronological series of entries on a particular topic.

Both of these communication tools can support collaborative learning. Groups discuss their work, share documents and resources, and receive feedback from the instructor and partners. In the meanwhile, the instructor can participate and monitor groups' work [22] via the discussion forum and chat room.

In this study, the use of web-based tools to support collaborative learning has already been acknowledged and accepted by all our participants and used in students' practice. Analysing students' assignments of the 'Online and blended learning' course, all the participants used at least one of the communication tools in their WBI sites, and three participants added both the

discussion board and chat room into WBI sites in order to ‘support real time and non-real time collaborative communication’.

## **4.2. Support Personalised Learning**

PebblePad as an e-portfolio is easy to share personal experience and opinion. The ‘Webfolio’ which is an evidence-based website tool is embedded in the PebblePad and used to create personal e-portfolio. Pages contained in the Webfolio can be added to, edited or deleted at any time, and may also contain links or other assets easily within the personal e-portfolio. In addition, PebblePad supports a number of export options which allow users to move their webfolios out as a zip archive file or a web site, or individual items as html, thus users may put their webfolios into any personal web space or disk for distribution. In this study, tutors made a coherent assignment which was creating individual e-journal about the course contents, personal views, questions and discussion in the PebblePad. Students constructed their own e-journals through the ‘Webfolio’. In each session, they used ‘Blog’ to record their learning views and experience, and added to their own Webfolio. Participants used ‘convenient’, ‘not complicated’ and ‘forming a learning community’ to describe the PebblePad. Due to the practical function, friendly user interface and good scalability, most of participants regarded the PebblePad as a good web-based tool to record and reflect on personalised learning.

## **5. STUDENTS’ PERSPECTIVES ON THE USE OF WEB-BASED TOOLS FOR LEARNING SUPPORT**

Participants gave positive evaluations of using WebCT for collaborative learning and PebblePad for personalised learning.

When students chose their tools, they did not care more about whether it is a big system or small one. Comparatively, they considered more whether it is easy to use or whether it fits their learning styles. Through my study of students’ use of web-based tools, I found that students preferred to use a mix of tools to support their learning, depending on the tools’ utility and ease of use.

What was highlighted through my observation of the course is that what is most needed to support students in using web-based tools in learning is having an authentic task in the learning process. When students first use a new tool, they do not only want to know how to use it, but what it can do or why they should use it. Tutors need to design authentic tasks and guide students to select and use appropriate tools. For example, in this study, we learned a virtual world system called ‘Second Life’ in the ‘ICT in Society’ course. The Second Life is a multi-user virtual environment supporting role-play, exploration, simulation and interaction through avatars [23]. Users may create their virtual world in this 3-D virtual environment, build and experience various social life and activities including academic activity, entertainment, business, and etc, as same as in the real world. There are few investigations about using SL in Education, but some research shows that multi-user virtual environments allow real time learning with visual, interactive components, which has great potential for the benefit to build a constructivist learning environment, especially in distance education [24].

The Second Life, as a role play tool, is totally different from WebCT. The Second Life requires more time online, and needs all participants to login at the same time, in this way it can be used to

extend our classroom learning in a virtual environment via virtual roles. Back to my study, in our Second Life exercise, we just had time to register and login in the system, then change our avatars and try to control them to explore the virtual world. Due to the lack of authentic tasks, participants did not have more opportunities to study and experience the Second Life in detail and in depth. However, when participants talked about the SL after course, they used more negative comments than the WebCT and PebblePad, such as 'It is complex', 'no use' and 'what should I do next?'

This case reflects the importance of authentic tasks in using web-based tools at an early stage. The lack of authentic tasks may restrict students' motivation for learning and using new tools, especially such a complex virtual environment.

## 6. CONCLUSION

This study focused on the general use of WebCT and PebblePad, providing an initial exploration of postgraduate students' use of web-based tools in a blended learning environment and the students' experiences within them. Future research can be more detailed in studying students' achievement and outcomes, especially the knowledge construction elements.

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