Abstract: The Blackboard learning management system was first implemented at Swinburne University in June 2001. Since then, all higher education subjects at Hawthorn, Lilydale and Prahran campuses have been set up with a Blackboard web presence. In June 2003 Sarawak implemented Blackboard as its learning management system with all higher education subjects having a web presence. This study seeks to investigate and compare students’ experiences of when and where they access their Blackboard subjects; students perceived and changing needs and explore and consider key themes apparent across campuses and make recommendations for continued improvement. The research will be a longitudinal and comparative study of adoption and usage patterns of the Blackboard learning management system at Melbourne and Sarawak campuses. The study will review experiences prior to 2003 and build on qualitative data gathered from online surveys of students at all Swinburne higher education campuses from 2004 onwards. The same survey will be used each semester over a period of three years.

The key aim of the investigation is to assist academic staff in the further improvement of the electronic learning experiences and environments they develop and provide for their students. The researchers are keen to gain an understanding of the students’ experiences and needs and to use these to inform professional development activities for academic staff as well as offer opportunities and suggestions for the continuous improvement for students of their online subjects in Blackboard.

Keywords: eLearning, Blackboard, blended learning.

Introduction

The education landscape has changed significantly since the introduction of the first computer network in 1969. The Internet has transformed, if not revolutionized teaching and learning processes. The Internet revolution over the past decade has given rise to new challenges and opportunities for education. The past six years in particular can be coined as the “renaissance
era” of education, whereby the delivery of the teaching and learning process has been reengineered to incorporate the digital medium.

This paper addresses the issues arising from the adoption of a blended learning approach through the implementation of Blackboard learning management system amongst different Swinburne campuses, namely Swinburne University of Technology in Melbourne, Australia and Swinburne Sarawak Institute of Technology in Sarawak, Malaysia. This paper commences with a brief explanation of the eLearning landscape and focuses on the blended learning approach. The subsequent section discusses the background of a eLearning implementation in Swinburne University of Technology (Melbourne campuses) and in Swinburne Sarawak Institute of Technology. The next part looks at the research methodology surrounding the survey in which the results are used for analysis. The final section studies data collected from recent surveys conducted in both campuses and uses the data for discussion and investigation.

Understanding blended learning

The learning process happens through interaction and there are essentially two kinds of interaction. Schrum and Berge noted that interaction occurs when a student individually interacts with others about the content (as cited in Berge, 2000) and the other is more of a social interaction, in which the student interacts with their peers and the teaching staff about the content (p. 25). The former will be the focus of this paper. In the traditional setting, interaction happens within the four walls of a classroom, whereby the teacher will deliver the content, the student will reflect and absorb the content, and the teacher will seek feedback from the student about the content. Such a setting is restrictive in the sense that learning is circumscribed by place and time. The introduction of the eLearning concept in 1997, helped eradicate this restriction.

The main catalyst for eLearning is the introduction of computer-based instruction. Computer-based instruction refers to the use of computers as a medium to instruct human users, often on a one-to-one basis, and to enhance students’ rehearsal and practice (Berge, 2000, p.24). eLearning is an umbrella term which covers various approaches such as purely online, blended learning, synchronous, asynchronous, self study with or without a subject matter expert, web-based, computer based (CR-ROM), and video/audio tape. This new form of delivery offers many advantages, part of which is the provision of on-demand access, convenience and portability, flexibility, increased collaboration, and increased social interaction which is essential to the learning process as highlighted in earlier paragraphs.

California Virtual University, a consortium of nearly 100 California colleges and universities, pioneered the first online program in 1997. This signified the first generation of eLearning which mainly presented content over the Internet. Harvey Singh (2003 p.51) reaffirms that such programs tended to be the online repetition of classroom-based courses without any customization to a new medium of delivery. The main drawback of this first generation eLearning approach was the insufficient choices presented to the course participants. Modifications to the first generation eLearning were targeted mainly to solving this problem and resulted in the introduction of blended learning models, which signifies the birth of the second-generation of eLearning. Singh (2003 p.53) explains that blended learning mixes various event-based activities, including face-to-face classrooms, live eLearning, and self-paced study. Blended learning uses multiple channels for the delivery of the course content and the facilitation of interaction. Offline and online delivery complement each other, and anecdotal evidence indicates that such delivery is more effective in more than one way. This
observation is substantiated by Berge (2000 p. 28), in which she asserts that a combination of delivery systems is almost always best.

As Gerard Prendergast says “the successful use of blended/online learning is probably the biggest opportunity and challenge that universities are currently facing.” “Too often considerations about information technology have become the dominant factors in many strategies adopted by academic institutions. This has resulted in a rich information technological environment that fails to capture, motivate or retain the learners.” (Prendergast, 2004, p. 2) The virtual environment must be conducive to learning much like a physical classroom. It is imperative that academics using the Blackboard learning management system ensure that the pedagogy drives the learning experience and not the technology. (Prendergast, 2004, p2) To assist in this, blended learning takes into account the various learning styles and this is something that the purely online approach is unable address. Understanding the students learning needs is the essential ingredient that will determine whether the eLearning approach will be successful in achieving its objectives or not. Derrick (2003 p. 5) emphasizes that “establishing the conditions necessary for facilitating and enhancing the capacity for sustained and enduring learning requires understanding which behaviours are important for independent, autonomous learning”.

Douglis (n.d.) maintains that blended learning is a continuous process, rather than just a “learning event” As mentioned previously, blended learning is a combination of online and offline deliveries in which both channels complement each other. By using this assertion, one can easily see that blended learning takes place before a lecture, during the lecture and after a lecture. The utilization of various combinations of tools such as discussion boards, emails and virtual chat rooms cater for the autonomy of pre- and post- lecture learning. Blended learning creates the atmosphere and the environment where participants are indirectly exposed to skills associated with autonomous learning such as initiative, resourcefulness, and persistence (Derrick, 2003, p.11).This is an excellent blueprint for sowing the skills needed for life-long independent learning amongst undergraduate students.

Background of eLearning implementation

The consideration to move to online delivery has been a matter of interest for many academic institutions. Visionary institutions in the education marketplace are advancing towards a flexible learning environment where students select how and when they study. As part of its strategic initiatives Swinburne University of Technology (SUT) has adopted the same vision for providing anytime-anyplace learning to its students by implementing a learning management system to support subject delivery. The SUT “learning and teaching policy requires flexible and learner centred provision of education that offers some choices to learners in meeting their individual needs and exercising their learning preferences. The timeline for the implementation of the learning management systems across all SUT (Melbourne) campuses is illustrated in Figure 1. There are currently 850 active subjects in Blackboard available for the use of students and lecturers.

Swinburne Sarawak Institute of Technology (SSIT) implemented Blackboard 5.5 during 2003. Blackboard Administrator training for Sarawak staff was provided at the Hawthorn campus by Learning and teaching Support (LTS) during May 2003. In July 2003, an Educational Development Advisor (EDA) based at Hawthorn campus ran a variety of extensive training and professional development workshops at the Sarawak campus for all academic staff. An initial 57 subjects were set up in preparation for the start of semester two
in August 2003. However, the number has increased considerably in semester 1 2004, with 283 active subjects on the Blackboard server as shown in table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>− School of Information Technology at Hawthorn using Blackboard from its own server from 2000</td>
</tr>
</tbody>
</table>
| 2001  | − Early 2001, senior management at Swinburne University of Technology (SUT) endorsed higher education division trials of the TechniCAL™ and Blackboard™ learning management systems.  
− 154 subjects using an in-house system ‘Elegant Solution’ at SUT Hawthorn, Prahran Lilydale were migrated to the 2 trial learning management systems.  
− From Semester 2, 2001 all Hawthorn and Prahran higher education subjects were set up in Blackboard version 5.  
− Extensive Professional Development program was put in place at the commencement of each implementation and getting started workshops at all SUT campuses upgrade phase for Blackboard version 5 with Learning and Teaching Support (LTS) Educational Development Advisors (EDAs) running demonstrations, and introductory and getting started workshops at Hawthorn, Lilydale and Prahran in July. |
| 2002  | − By 2002 SUT was supported by three main learning management systems, Blackboard 5 in Hawthorn and Prahran higher education divisions, WebCT in the TAFE Division and the higher education division of Business at Lilydale, and TechniCAL in all other Lilydale higher education divisions.  
− In July 2002 the administration and management of all School of IT subjects were migrated to the main Blackboard server.  
− Processes were put in place for a planned migration and upgrade to Blackboard v6 Enterprises across all higher education divisions by January 2003 |
| 2003  | − Approximately 600 subjects successfully upgraded in Blackboard v6 and ready for the commencement of semester one 2003.  
− Planned upgrade to Blackboard v6 Enterprise across all higher education divisions in Semester 1 2003.  
− Extensive Professional Development program was put in place at the commencement of each implementation and upgrade phase for Blackboard version 6 with Learning and Teaching Support (LTS) Educational Development Advisors (EDAs) running demonstrations, and introductory and getting started workshops at Hawthorn, Lilydale and Prahran.  
− In response to individual subject and school based needs additional workshops offered focusing on communication, assessment and further enhancements such as video, streamed media and animations.”  
− Training and induction for SSIT administrators and academic staff at Hawthorn and Sarrewa. |
| 2004  | − Higher education division subjects at Hawthorn, Lilydale and Prahran were using Blackboard version 6. |

Figure 1: Timeline of Swinburne University of Technology’s eLearning Implementation

<table>
<thead>
<tr>
<th>Number of active subjects in Blackboard at SUT and SSIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 2 2001</td>
</tr>
<tr>
<td>SUT</td>
</tr>
<tr>
<td>SSIT</td>
</tr>
</tbody>
</table>

Table 1: Active Subjects Websites at SUT and SSIT

Research Methodology

Background information

To date there have been five surveys undertaken; four at SUT and one in SSIT. The surveys were distributed at the end of semester. The five surveys were: semester two, 2001; semester one, 2002; semester two, 2002 and semester two, 2003 all at SUT and semester two, 2003 at
SSIT. The original survey in November 2001 was developed in a website and linked with a “survey” icon on the Blackboard log in page. Data from the web page was then manually copied from the website and collated.

During semester two 2002 an online survey was developed using a new product called Surveyor™ which is a web based survey application allowing production and publishing of surveys using a web browser. A variety of reports can be generated and either displayed in a web browser or exported to excel for further analysis. This method allowed for the link to be emailed to all student Blackboard users. It was also placed on the log in page and posted in announcement pages of any Schools course Blackboard sites but not in individual subjects. This format of survey was then used for the 2002 and 2003 surveys. Apart from slight amendments to some questions all questions in each of the surveys have remained the same. The survey was open initially for a two-week period in 2001 but for subsequent surveys in 2002 and 2003 it was open for a period of four weeks; the two weeks prior to the end of semester and; two weeks during exam times. The survey was open for a longer period of time in order to attract more respondents.

The survey invited categorical responses to questions that canvassed educational matters, issues of choice and flexibility, and issues of usability. For each question comment was invited. General comments were also solicited. The participants in this study were students who had access to their subject’s Blackboard sites during 2001, 2002 and 2003 and volunteered to participate in an online survey. The participants were either undergraduate or postgraduate students in any year level studying on or off campus from all Swinburne higher education campuses. The Swinburne campuses include Hawthorn, Lilydale, Prahran and Sarawak. The initial surveys were only distributed in the Melbourne campuses (Hawthorn, Lilydale, Prahran) and it was not until 2003 when Sarawak implemented Blackboard that the survey was circulated there. Two separate surveys were distributed in 2003; one for Melbourne campuses and one for Sarawak but in each case the survey was exactly the same.

<table>
<thead>
<tr>
<th>Group</th>
<th>Question Range</th>
<th>Theme</th>
<th>Question Description</th>
</tr>
</thead>
</table>
| A     | 1 - 8          | Related to the flexible provision of learning and invited a variety of rating responses. | 1. I access my online subjects  
2. I access my online subjects  
3. My online subjects give me choices about where and when I study  
4. My online subjects give me choices about how I learn  
5. My online subjects assist my learning  
6. I would like formal face-to-face session with lecturers / tutors  
7. I would like informal face-to-face consultation with lecturers / tutors  
8. I like to have or would like to have online access to |
| B     | 9 - 17         | Related to the use of online subject pages (i.e. any area of the subject set up with a Blackboard web presence). These questions invited | 9. I find it easy to navigate in my online subjects  
10. I have referred to the online subject announcements  
11. I have made use of online |
responses of ‘not applicable’, ‘yes’ or ‘no’.

12. I have made use of virtual (synchronous) chat
13. I have made use of online learning resources/content for my subject(s)
14. I have made use of interactive animations or simulations
15. I have made use of online video material/video on demand
16. I have made use of online assignment submission/digital drop box
17. Help with use of my online subjects is adequate
18. What school are you enrolled in?
19. What subjects have you accessed in Blackboard? Provide subject code only.

Table 2: Questions covered in survey

Results and Analysis of Survey

The table below indicates the number of respondents to the survey in comparison to the number of subjects available in Blackboard and the number of students enrolled in Blackboard.

<table>
<thead>
<tr>
<th></th>
<th>Semester two 2003 Sarawak</th>
<th>Semester two 2003 Melbourne</th>
<th>Semester two 2002 Sarawak</th>
<th>Semester two 2002 Melbourne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>116</td>
<td>878</td>
<td>718</td>
<td>174</td>
</tr>
<tr>
<td>Number of weeks open</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Number of subjects in Bb</td>
<td>57</td>
<td>639</td>
<td>438</td>
<td>290</td>
</tr>
<tr>
<td>Number of Bb enrolled students</td>
<td>657</td>
<td>10117</td>
<td>9951</td>
<td>9838</td>
</tr>
</tbody>
</table>

Table 3: Number of survey respondents in comparison to the number of subject websites and the number of students enrolled in Blackboard

Analysis
SUT
The results from the SUT survey indicated that most students accessed their subjects more than ten times during semester for a variety of information and reasons with many commented that it was “because they had to” to check for new materials, discussion postings or new
announcements. Some students said ‘accessing was a waste of time as nothing changed’. Students accessed Blackboard from a variety of on and off campus locations with the majority accessing it from home. Many students complained about having to access materials from home when they didn’t have Internet access or fast speed modems.

The majority of students commented on the convenience and flexibility of being kept ‘informed and up to date’ and the flexibility available of where they access Blackboard. Most students’ were agreed that online subjects offered them a variety of ways of learning but not necessarily a choice of how to learn. Some students suggested that having ‘choices’ didn’t always encourage a commitment to study. Most students indicated that Blackboard provided a variety of information but there were recurring comments related to out of date announcements and/or content and the perceived lack of use by lecturers. Students prefer having face-to-face sessions with lecturers and commented on the current lack of contact and availability by lecturers and / or the slow response time to online communications between staff and students. They felt that informal communications with lecturers was very important but it was very hard to make consultation times with them.

Navigation seems to be a continuing problem for student because the navigation, structure and layout of materials are not logical. Students suggested a need for consistency with a standard format for specific content and consistency across subjects for names of buttons and location of information. Students appreciated the regular use of announcements by lecturers but found it extremely frustrating to have old announcements in their subjects. Many students felt that the discussion forums were the most helpful resource in online learning but ‘they are only as useful as the teacher on the other end’. Very little use was made of synchronous chat facilities. Students wanted access to a range of materials and resources but the most common was a need to access previous exams. The majority of students would like to see more online resources made available to them but suggested dissatisfaction in what is made available. Many students had made use of the online submission facility via the drop box however they expressed concern about the stability, security and safety of submitting a variety of file formats and sizes and the safe arrival to the destination lecturer.

In summary SUT students responded positively to the use of Blackboard to supplement their learning however, many indicated dissatisfaction with the structure and navigation; the infrequent use by academics; the outdated announcements and content; and the lack of use of many of the features which students felt would add value to their online learning experiences. 

SSIT

In Sarawak most students accessed their subjects more than ten times during semester and from a variety of locations. The data indicated that the majority of students agreed that there was a choice but the comments did not reflect this. Some agreed that online subjects offered them choices about learning but a large number were undecided. They felt that Blackboard provided a variety of information, guidance, communication and tools to assist their learning but only ‘if the lecturers use it’. Students prefer that face to face sessions with lecturers continue with many wanting more contact and indicating that informal communications with lecturers was very important but it was very hard to make consultation times with them. 

In their use of Blackboard there was general agreement that navigation was easy with the majority of students accessing announcements and making use of the discussion forums, online resources and online submission but they wanted access to a greater range of materials and resources.
In summary SSIT feedback from students was positive in their use of Blackboard but many had problems with accessing computers on campus or the Internet from home. Students had concerns about the cost of printing notes from Blackboard and wanted more features or tools in Blackboard made available to them e.g. discussion forums, chat, and more content.

A close investigation of the survey results shows that a number of key themes emerged in each iteration of the survey and at both SUT and SSIT campuses. The students were very responsive to writing suggestions and many comments were directed at the lecturers. Numerous comments were based on perceptions that, academics either are not using Blackboard or not using Blackboard enough or not using Blackboard effectively. Other key issues emerging for the students was the need for more variety of content and resources that is regularly updated and easily downloaded, more use of announcements; grade books and assessments for regular and timely feedback on progress, and more online interaction via discussion forums and assessments and more opportunities for consultation time with lecturers/tutors.

Discussion

Yoon (2003 p. 19) suggests that the “online student’s learning experiences are largely shaped by their interactions with course materials, technological interfaces, their peers, and all their key players in a technology-mediated environment”. The findings from the survey clearly show that the student’s learning experiences facilitated by Blackboard was mediocre.

The discussion of eLearning delivery has always involved the discussion of bandwidth. Bandwidth limitation is a persistent problem that has plagued participants of online programs ever since the introduction of this delivery method. It is undeniable that the situation has improved with the advent of new telecommunication technologies, but this problem still exists and must be considered at all times during the development of an eLearning course. The main frustration is that this is a technological issue which cannot be easily resolved because the application is very dependent on the technological state of the Internet Service Provider in the locality of the participant. Downloading 1 MB file over a normal 14.4 kbps dial-up connection will be a time-consuming not too mention frustrating task. On the other hand, even if the student has broadband connection, it is still extremely trying to download a large file of 22 MB. This has been one of the contributing factors for high attrition rates in any eLearning program.

Comments from the surveys have mentioned problems with academic staff providing extensive PowerPoint presentations in Blackboard and students having great difficulty downloading and then printing them. To assist students and provide advice for academics with these types of issues a website dealing specifically with accessibility in Blackboard has been developed by LTS called “Accessibility and inclusion in learning and teaching.” One section provides a step-by-step guide to maximising accessibility of subject materials posted on Blackboard. Lecturers and instructors must always give consideration to the range of accessibility issues and to develop materials suitable for digital delivery. Berge (2000) warned that long documents delivered over Web pages are tedious to read on-screen and are usually printed out by students. She went on to say that for individual students with their own printers this may not be an issue, but it can be a significant barrier for students who must pay a per-page printing cost or who share lab facilities with others at remote sites. Bandwidth is also an important aspect in the transmission of digital and audio content. This inhibitive factor can limit the features on Blackboard that is utilized by lecturers. Use of media such as audio and video files particularly streaming of lectures in the content area are slowly becoming
popular with the lecturers but bandwidth issues can be a disincentive. Not using these features result in the students perceiving lack of use by the lecturer. On the other hand, student’s perception of lack of use by lecturers is justified and warranted if the lecturer doesn’t incorporate the use of other tools such as discussion boards, virtual classroom and lightweight chat in the online delivery of the subject content. One possible contributing factor could be the resistance arising from the change introduced by Blackboard in the way the lecturers perform their duties. Bates noted (as cited in Fein and Logan, 2003 p. 45) that “transitioning from face-to-face instruction to online learning can be a difficult change to make and requires making a paradigm shift”. Some lecturers are not comfortable using asynchronous discussion methods or virtual discussions when interacting with the students, thus less emphasis has been placed on online interaction and Blackboard’s function has been limited to the display of information. However, in contrast, there are lecturers who are using the collaborative tools but they are not using it efficiently and effectively, and the students can pick this up easily. As an example, discussion boards which are not properly moderated and monitored can cause numerous problems such as the use of abusive languages or profanity, postings of discriminatory message which serves the purpose of political/non-political agendas. Slow response time is also one problem associated with the use of discussion board. The ‘slow response time’ expression is also pegged to electronic mails, in which the students feel that the lecturers are not timely in their response. This also leads to the students feeling isolated from the instructor and their peers through perceived lack of contact and availability of the lecturer. A lecturer needs to understand that it is easier for a student to feel isolated in a virtual learning environment, as opposed to a physical classroom. If a lecturer is unable to avail themselves to the students for one reason or another physically and virtually, they must take corrective steps to overcome the possible feelings of isolation, which can affect the overall student eLearning experience. It is important that staff development programs in online learning incorporate advice and tips on facilitation and moderation and opportunities for academics to share their experiences of how they use asynchronous communications.

Website design has always been a major concern of developers and there has always been an emphasis placed into making a website user-friendly. Comments from the survey suggested that Blackboard subject websites have illogical navigation and structure, and inconsistent design. The students, especially those who are not from a technical background often get confused and lost when going through these sites. One possible cause could be that the subject lecturer themselves have minimal skill in website development and this is evident when planning and designing their respective Blackboard sites. This leads to another concern which is raised by the lecturers, that is the time required in the development of a subject website. Berge confirms this by saying that the preparation of computer-based instruction materials are labour-intensive and is often characterized by long development times and high development costs. When pressed for time, the lecturers will tend to do a hurried job and place less or no emphasis at all on the overall ‘look-and-feel’ of the subject website. Laurillard (2002 p.199) emphasises the importance of embedding materials properly into courses and subjects by considering the students needs and designing learning activities using the variety of technological media available using a theoretical foundation. She states that “educational technologies demand effort and ingenuity in the development of materials, but rarely is this extended to the embedding of those materials in their educational niche.” Educational developers working closely with academic staff need to provide opportunities for the design and development of subjects that embed technologies as a pedagogical component rather than just an added feature because it is there! We need not only to look at the objectives in each subject as a major part of the learning design process but also consider the development of the learning materials in tandem with the delivery which “encompasses the support system needed to help students achieve the maximum benefit from their study”

**Conclusion**

Prendergast (2004 p.3) stresses that “the educator is the trigger to foster or stimulate online learning, not the technology. If used appropriately, technology is just a tool that permits facilitating educators to encourage learning in a flexible imaginative way.” It is therefore important that as educators we listen to what the students are saying and use their experiences to assist in informing professional development of academics in the pedagogies of flexible and online learning. Providing opportunities through face to face and hands on workshops incorporating understandings in learning theories will develop skills and enhance the students learning experiences. The conduct of surveys such as the ones described in this paper provide valuable feedback which needs to be addressed in the design, development and planning of not only subjects using Blackboard by individual academic staff but also as part of academic staff development programs.

As Ramsden (1992 p.5) says; “The aim of teaching is simple: it is to make student learning possible.” Academics must be forever cognisant of the changes around them; the technologies; and the changing nature of higher education; and as such the need to continually improve teaching to advance student learning. Ramsden (1992 p. 269) went on further to say that “It is up to us as teachers to take control of improving teaching, especially by listening respectfully to our students about how we can help them to learn”.

**References**


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