

Blended Learning Paradigm at the University of Western Sydney

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Abstract

In the inevitable changes confronting educators, various options are being considered in order to satisfy the primary demand imposed on academics: the spread of existing knowledge, generating new knowledge through research, and training student cohorts in the bases needed in their future professional vocation and growth as well as prepare them for lifelong learning. On the other hand, these primary elements are in constant dynamic balance with different kinds of elements that have a limiting effect: chronic shortage of funding for teaching and research, fluctuating student numbers, increasing administrative accountability and inadequate staffing to mention a few. The outcome of this dynamic is a compromise, usually at the expense of the primary drivers. An interim solution is evolving at the tertiary level, through which most of the primary objectives could be fulfilled – using e-learning either for appropriate segments either in an academic unit or course, referred to as “scaffolding”, or as a stand alone paradigm in its own right. The former is being adopted by educational institutions in Australia under the banner of “blended learning”. Practitioners see it as a welcome integration of best practices of face-to-face and e-learning (i.e. online learning) ultimately offering a variety of learning styles while preparing the future professionals for lifelong learning while on the job and beyond. The ultimate solution could well be a complete e-learning course: delivered online without the physical presence of the educator. The former is seen as most suitable for the starting of an educational experience with the junior cohorts taught principally by the conventional face-to-face technique, while the later is more suitable for senior students in the latter years of their studies. Some high schools in Australia are already committed to online learning and their students are technology savvy by the time they reach the university, however, the range of skills vary greatly. The aim of this note is to comment on blended learning with a particular focus on the authors’ own university, which has opened this approach by supplying all first year cohorts with an iPad as well as associated staff. Specifically, the implementation of the web-based learning in the School of Computing, Engineering and Mathematics will be discussed. Coming to terms in this scenario with the challenges of the hands-on aspects of engineering courses will also be addressed.

Keywords: education, e-learning, hands-on, blended learning, web-based learning.

1. Introduction

Web-based learning has been around ever since internet and wi-fi opened this hitherto unexplored mode of delivery, presenting educational material at any time, anywhere and to anyone who is logged-in. Utility of such an educational mode resulted in its increasing acceptance, evolving into a new paradigm of teaching and learning, which in its ultimate outreach spans the globe giving everyone with access to equipment an opportunity to learn. However, not all the disciplines can be delivered fully online because of their inherent hands-on component. This particularly concerns engineering and medicine – for obvious reasons. There are also some pedagogical issues involving personalised attention to students in the traditional manner of student-teacher-tutor-mentor relationship. Physical presence of the teacher, the teacher’s enthusiasm and wide expertise and professional wisdom has an inspirational effect on students serving as a role model. Such aspects are addressed in the “blended learning mode” which is a mixture of face-to-face presentation of the lecture material and the online component.

It is arguable that technological savvy students enter university expecting continuation of their learning using the online mode, which is increasingly being introduced in many universities world wide. Web-

based learning is seen as ultimately preparing students for life-long learning and professional development once they leave formal education environment.

The aim of this note is to focus on the blended learning paradigm at the authors' university, where it has been implemented in earnest in 2013, and comment how new structures evolved within the university to cater for the augmenting mode of learning in its nascent stage. The specific focus is on the School of Computing, Engineering and Mathematics (SCEM) where the authors are located and hence familiar with the blended learning protocol adopted by the school to meet its specific needs. While other schools also use blended learning in the curriculum delivery, their approach is geared to meet their needs and does vary in detail. This note does not delve into different methodologies used by different schools. Nevertheless, it is hoped that it would provide some helpful insights to those contemplating this step in their universities in similar areas.

2. Blended Learning at the University of Western Sydney (UWS)

The first year UWS cohort of students in 2013 and 2014 were all given an Apple iPad (16GB with retinal display) as the university embarked on the new program of technology based learning, which has been enshrined in the 2020 vision of the University Vice Chancellor and President. The university has engaged a team of Blended Learning specialists (Advisors) to provide guidance to learning unit Coordinators by way of advice on pedagogical aspects of the undertaking and selection of the right tools for the specific application. Another team (Designers) was engaged to provide assistance with the design of the specific Blended Learning tool in terms of help with the technology and building of the online content.

As the University has eight academic streams each accommodated in an independent school, each with its own specific teaching and learning requirements, it mandated allocation of Blended Learning Advisers and Designers to each school. Overall, and university wide, there is a central team under a guidance of a Blended Learning Consultant with a team of Blended Learning professionals responsible for the support of smaller teams attached to each school. Figure 1 illustrates the relationship of the Blended Learning structure amongst its various components.



Figure 1. Blended Learning Team structure within UWS.

3. Blended Learning at the School of Computing, Engineering and Mathematics (SCEM)

The School of Computing, Engineering and Mathematics has a team of five dedicated professionals to assist academics with their Blended Learning tasks. The specific approach within SCEM to each unit is conducted sequentially along the following precepts:

- Decide on the rollout of units for the year
- Make Contact with the Director of Academic Program (DAP)
- Consult with DAP's on the rollout or units for Blended Learning (BL)
- Make contact with Unit Coordinators (UC's)
- Send out the unit plan [Figure 2]
- Basic Standards are completed by the BL Designer
- Advanced Standards are completed by the BL Advisor
- BL Agreement is set up by the BL Advisor making recommendations for online components based on the unit plan
- BL Agreement is amended based on meeting outcomes with UC, outlining what is going to be done to the unit to make it a blended unit
- DAP and UC signs off on what is going to be developed within the unit
- A logbook is then created outlining all the tasks that need to be completed
- Each member of the team works on the task to complete what has been assigned to them.
- Consultation goes through one person between the BL team and the Academic (Usually the BL Advisor)
- Agreement is signed off as completed
- Site is evaluated after it has been completed
- Support for completed units
- Training of academics throughout process

3.1. SCEM Rollout of Blended Learning

The rollout of units is structured so that each of the units is completed within a year of study:

- 2013 all 1st Year Units for implementation in 2014
- 2014 all 2nd Year units for implementation in 2015 + 1st year unit maintenance
- 2015 all 3rd Year units for implementation in 2016 + 1st and 2nd year unit maintenance.

The SCEM BL team uses a spread sheet to plan the rollout of units to be blended. It is an interactive spread sheet that tracks what is happening with each unit as a whole and provides an overview look at each of the units.

A Blended Learning Unit Plan for 2014

Course Code: _____ Unit Code: _____ Course Title: _____ Unit Title: _____ Completed by: _____ University of Western Sydney

L.U.T. Experiences	My Current Practice		My Ideal Blended Learning scenario (the end goal in my blended learning plans)		What will I achieve with Blended Learning by 2015	
	Face-to-face learning and teaching	Equivalent online options	Face-to-face learning and teaching	Equivalent online options	Face-to-face learning and teaching	Equivalent online options
Teaching/active	<input type="checkbox"/> Lectures <input type="checkbox"/> Tutorials <input type="checkbox"/> Labs <input type="checkbox"/> Practicum <input type="checkbox"/> Workshops <input type="checkbox"/> Seminars <input type="checkbox"/> Guest lectures <input type="checkbox"/> Marking and feedback on assessments <input type="checkbox"/> Other	<input type="checkbox"/> Recorded lectures <input type="checkbox"/> Live streaming of lectures <input type="checkbox"/> Desktop recordings <input type="checkbox"/> Webinars <input type="checkbox"/> Recorded webinars <input type="checkbox"/> Videos/audio with associated student activities <input type="checkbox"/> PPT with audio <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Polling <input type="checkbox"/> Surveys <input type="checkbox"/> Social media <input type="checkbox"/> Online guest presenters <input type="checkbox"/> Online marking with feedback <input type="checkbox"/> Digital curation <input type="checkbox"/> Learning analytics <input type="checkbox"/> Student response systems <input type="checkbox"/> Mobile learning	<input type="checkbox"/> Lectures <input type="checkbox"/> Tutorials <input type="checkbox"/> Labs <input type="checkbox"/> Practicum <input type="checkbox"/> Workshops <input type="checkbox"/> Seminars <input type="checkbox"/> Guest lectures <input type="checkbox"/> Marking and feedback on assessments <input type="checkbox"/> Other	<input type="checkbox"/> Recorded lectures <input type="checkbox"/> Live streaming of lectures <input type="checkbox"/> Desktop recordings <input type="checkbox"/> Webinars <input type="checkbox"/> Recorded webinars <input type="checkbox"/> Videos/audio with associated student activities <input type="checkbox"/> PPT with audio <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Polling <input type="checkbox"/> Surveys <input type="checkbox"/> Social media <input type="checkbox"/> Online guest presenters <input type="checkbox"/> Online marking with feedback <input type="checkbox"/> Digital curation <input type="checkbox"/> Learning analytics <input type="checkbox"/> Student response systems <input type="checkbox"/> Mobile learning	<input type="checkbox"/> Lectures <input type="checkbox"/> Tutorials <input type="checkbox"/> Labs <input type="checkbox"/> Practicum <input type="checkbox"/> Workshops <input type="checkbox"/> Seminars <input type="checkbox"/> Guest lectures <input type="checkbox"/> Marking and feedback on assessments <input type="checkbox"/> Other	<input type="checkbox"/> Recorded lectures <input type="checkbox"/> Live streaming of lectures <input type="checkbox"/> Desktop recordings <input type="checkbox"/> Webinars <input type="checkbox"/> Recorded webinars <input type="checkbox"/> Videos/audio with associated student activities <input type="checkbox"/> PPT with audio <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Polling <input type="checkbox"/> Surveys <input type="checkbox"/> Social media <input type="checkbox"/> Online guest presenters <input type="checkbox"/> Online marking with feedback <input type="checkbox"/> Digital curation <input type="checkbox"/> Learning analytics <input type="checkbox"/> Student response systems <input type="checkbox"/> Mobile learning
Assessment	<input type="checkbox"/> Essays <input type="checkbox"/> Mid-semester Exams <input type="checkbox"/> Final Exams <input type="checkbox"/> Projects <input type="checkbox"/> Presentations <input type="checkbox"/> Product development <input type="checkbox"/> Posters <input type="checkbox"/> Peer review <input type="checkbox"/> Other	<input type="checkbox"/> Online quizzes <input type="checkbox"/> Online submission of assessment <input type="checkbox"/> Wiki (individual or group) <input type="checkbox"/> Blog (individual or group) <input type="checkbox"/> Learning Journal (individual or group) <input type="checkbox"/> Discussion Forum contributions <input type="checkbox"/> Group submissions <input type="checkbox"/> Online presentations <input type="checkbox"/> Creating digital items <input type="checkbox"/> Online peer review <input type="checkbox"/> Online feedback	<input type="checkbox"/> Essays <input type="checkbox"/> Mid-semester Exams <input type="checkbox"/> Final Exams <input type="checkbox"/> Projects <input type="checkbox"/> Presentations <input type="checkbox"/> Product development <input type="checkbox"/> Posters <input type="checkbox"/> Peer review <input type="checkbox"/> Other	<input type="checkbox"/> Online quizzes <input type="checkbox"/> Online submission of assessment <input type="checkbox"/> Wiki (individual or group) <input type="checkbox"/> Blog (individual or group) <input type="checkbox"/> Learning Journal (individual or group) <input type="checkbox"/> Discussion Forum contributions <input type="checkbox"/> Group submissions <input type="checkbox"/> Online presentations <input type="checkbox"/> Creating digital items <input type="checkbox"/> Online peer review <input type="checkbox"/> Online feedback	<input type="checkbox"/> Essays <input type="checkbox"/> Mid-semester Exams <input type="checkbox"/> Final Exams <input type="checkbox"/> Projects <input type="checkbox"/> Presentations <input type="checkbox"/> Product development <input type="checkbox"/> Posters <input type="checkbox"/> Peer review <input type="checkbox"/> Other	<input type="checkbox"/> Online quizzes <input type="checkbox"/> Online submission of assessment <input type="checkbox"/> Wiki (individual or group) <input type="checkbox"/> Blog (individual or group) <input type="checkbox"/> Learning Journal (individual or group) <input type="checkbox"/> Discussion Forum contributions <input type="checkbox"/> Group submissions <input type="checkbox"/> Online presentations <input type="checkbox"/> Creating digital items <input type="checkbox"/> Online peer review <input type="checkbox"/> Online feedback
Technology/communication	<input type="checkbox"/> Announcement in lecture/tutorial <input type="checkbox"/> Office consultations <input type="checkbox"/> Notice on door/noticboard <input type="checkbox"/> Email <input type="checkbox"/> Other	<input type="checkbox"/> Email or message in vUWS <input type="checkbox"/> Announcement in vUWS <input type="checkbox"/> Discussion Forum <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Online consultations <input type="checkbox"/> Notifications dashboard <input type="checkbox"/> Early warning notifications <input type="checkbox"/> Mobile learning <input type="checkbox"/> Webinars <input type="checkbox"/> Social Media	<input type="checkbox"/> Announcement in lecture/tutorial <input type="checkbox"/> Office consultations <input type="checkbox"/> Notice on door/noticboard <input type="checkbox"/> Email <input type="checkbox"/> Other	<input type="checkbox"/> Email or message in vUWS <input type="checkbox"/> Announcement in vUWS <input type="checkbox"/> Discussion Forum <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Online consultations <input type="checkbox"/> Notifications dashboard <input type="checkbox"/> Early warning notifications <input type="checkbox"/> Mobile learning <input type="checkbox"/> Webinars <input type="checkbox"/> Social Media	<input type="checkbox"/> Announcement in lecture/tutorial <input type="checkbox"/> Office consultations <input type="checkbox"/> Notice on door/noticboard <input type="checkbox"/> Email <input type="checkbox"/> Other	<input type="checkbox"/> Email or message in vUWS <input type="checkbox"/> Announcement in vUWS <input type="checkbox"/> Discussion Forum <input type="checkbox"/> Synchronous chat/virtual classroom <input type="checkbox"/> Online consultations <input type="checkbox"/> Notifications dashboard <input type="checkbox"/> Early warning notifications <input type="checkbox"/> Mobile learning <input type="checkbox"/> Webinars <input type="checkbox"/> Social Media

Figure 2. Blended Learning Unit Plan.

All the information needed to track the status of each unit is displayed on the one page along with the point of contact and their role within the team. Each unit has one person that maintains contact with the Academic to ensure that they are kept in the loop with all the academic decisions that are being made about the unit and that the Academic is agreeable with the progress and the decisions that have been made.

The spread sheet outlines where each unit is up to in the development phase. And uses a series of drop down menus to change the progress of units and determine where they are up to.

The rollout is determined by consultation with DAPs [Director of academic program] within each main area of the school; Construction Management, Computing, Mathematics, Engineering and Industrial Design. The DAPs look at the work load of their academic staff and determine when is the best time within the year for the rollout of blended units to occur. Taking into consideration the timeframe and funding that has been allocated for each unit.

After the DAP consultation it is then the Blended Learning Advisors role to contact the Unit Co-ordinator with the BL Unit Plan [Figure 2]. After they fill this out they send it back and the consultation process begins.

3.2. Consultation Process

3.2.1. Unit Plan

The unit plan is designed to start the academic thinking about what it is that they would like to achieve through the blending of their unit, and what can be implemented in the next delivery of the unit. It is the start of an ongoing process that requires and encourages the continual development and evaluation of courses to ensure that students are getting the best from the university and that the university is encouraging students to become lifelong learners.

3.2.2. Basic Standards

The BL Designer completes the basic standards for each of the sites that they have been assigned to. This involves going to a current site or an old vUWS (virtual UWS – Blackboard) site and evaluating the site. The basic standards involve the look, navigation and the functionality of the site. This involves navigating around the site ensuring the layout is logical and intuitive design and meets with copyright and accessibility requirements.

3.2.3. Advanced Standards

The Advanced standards are completed by the BL Advisor and are focused around the educational implementation and presentation. The educational methodology is very important in the process as it ensures that technology is not just being used for technologies sake but that there is a pedagogical purpose.

3.2.4. Blended Learning Agreement

The BL Agreement compiles the desired tools the UC wishes to implement in the unit from the Unit Plan, and recommendations based on the Basic and Advanced Standards. A meeting takes place between the BL Advisor and the UC (see 3.2.6) to discuss the recommendations and development of the unit. The agreement breaks the development into tasks with responsible parties assigned and deadlines determined. All key stakeholders need to agree to the BL Agreement. The key stakeholders are; DAP UC, BL Advisor and BL Designer.

3.2.5. Meeting with the Academic

The meeting with the academic determines the direction of BL within the unit and discusses the recommendations provided, assigns responsibility for tasks to complete with deadlines for completion. The online activities are linked to student outcomes and the most appropriate tool is chosen with this outcome in mind. The meeting makes sure that any implementations made in the unit are fit for purpose, and that there is benefit to either students or staff. The range of development is also examined to avoid overwhelming students with learning technology rather than content. Future directions of blended learning in the unit are also discussed as well as any professional development needed to deliver the activity.

3.2.6. The Logbook

The logbook provides a list of tasks to be developed in a unit with the person(s) assigned and deadline for completion. The logbook offers an overview of the development of the unit, allowing all the key stakeholders to keep track of the status of each task. The logbook also sets realistic deadlines for tasks and includes any changes to the agreement plan or any issues that arise.

3.2.7. Site Development

The development of the site is based on the BL Agreement and is documented in the logbook. Common recommendations that have received widespread acceptance amongst the academics are; restructuring of homepage and navigation, collaboration tools such as wikis and webinars, recorded lectures and tutorials and online quizzes and assignment submissions.

The purpose for the creation of a friendly and engaging home page that is easy to navigate, is intuitive and is not cluttered with too much information or extraneous modules is to transfer the processing focus from navigation to content.

Flexibility of modes and times is an aim of blended learning. Wikis are being introduced and utilised for group collaboration with the benefit that everything within the wiki is tracked and past versions can be viewed by students and graded individually or as a group, often using inline marking. This allows student flexibility to participate either synchronously or asynchronously. Webinars provide an opportunity for synchronous online lectures or tutorials. This may take place anywhere and allows for students studying across campuses. An added benefit is recording the webinar so students that are not able to join live can review the lecture or tutorial.

Recorded lectures also allow greater flexibility for students in terms of time of study and engagement with the content. Students are able to access the recordings when they are most likely to be paying attention, and can control the information flow to suit their needs, for example, by pausing to allow time

to process or reviewing the information. Lecturers may also focus information by creating tutorials of key concepts. Recordings of tutorial pre-work may see an increase in engagement in tutorial sessions.

Moving assessments online can improve the amount of time a lecturer may take to process assessments. Online quizzes offer automatic marking and feedback to students, however, not all quiz questions are appropriate for online quizzes. Mathematical questions in particular bring some obstacles of testing the process vs testing the answer. Submission of assessments online provide a secure logging system, plagiarism check and if set up with inline marking and clear rubrics, can promote consistency of marking across tutors.

3.2.8. Training

Academics are increasingly expected to be proficient in the use of online tools in addition to experts in their field. This can be achieved with training and support. One of the key things that need to be developed for the academics is the skills to utilise the tools that are being implemented in the sites. This is crucial because the academics need to be able to use and implement the tools by themselves and be able to troubleshoot problems that they have when they add students into the mix.

A variety of training methods are used to equip academics with the skills and knowledge to implement technologies within the classroom. The training methods used are:

1. Group training – when multiple academics want to be trained on the same thing and can all come together and practice the skills.
2. Individual training – demonstrating and letting an academic practice a skill in a one on one environment.
3. “How to” guides – to support the group and the individual training by providing step-by-step instruction guides to aid development of their skills.
4. Instructional videos –how to videos are developed to guide the academic through the process for asynchronous, ‘just in time’ training.

3.2.9. Evaluation and sign off

At the end of the development of a unit as determined by the completion of the logbook, the UC and DAP are asked if the development is as expected. At this point, any further changes are completed and documented. After all the tasks have been completed in the log book the UCs and the DAPs are sent the checklist to check the site and make sure that it is ready to use in the next delivery, including key features of the site so that it can be taught effectively and successfully.

Once the unit has been implemented, the UC and BL Team will assess the effectiveness of the tool or activity in relation to the purpose or outcome. This evaluation will determine the ongoing development of blended learning activities within the unit, amending where necessary. At this stage of the SCEM development units will undergo evaluation in July 2014.

4. Early experiences

Since its inception in 2013, it is still early to give conclusive comments about impact of BL on the students’ scholastic performance overall. Since most of the units have not been addressed fully in terms of translating them into a BL format, and since it is a relatively slow process to provide a fully serviced BL unit, no generalisations can be made. However, the following observations suggest themselves:

- It is one matter to construct a BL module for a given unit, and quite another to modify it after a period of use so as to maximise its learning effect to students.
- SCEM has over 300 units on offer in its various programs. With a staff of 5 dedicated Advisers/Designers it will take several years before all courses will be fully provided with a BL capability such that an overall assessment could be made.

From a student perspective, BL has accommodated work commitments so as to slot in study when most appropriate while catering for a wide range of learning styles.

From a staff perspective, reducing the quantity of face-to-face activities reduces timetabling issues, as well as making it possible for staff to attend conferences without interrupting students learning pattern.

5. Conclusions

The Blended Learning program has found wide acceptance amongst students and staff. It is a new paradigm with promise and expectations of lasting benefits to students extending from the university study to professional practice, professional development, and beyond. Once installed, it offers benefits to staff as well to devote more time to other aspects of academic endeavours.

References

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