

MAKING THE TRANSITION: ACHIEVING CONTENT CONNECTIVITY AND STUDENT ENGAGEMENT THROUGH FLEXIBLE LEARNING TOOLS

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ABSTRACT

This paper describes how blogs, interactive on-line learning modules (IOLMs) and wikis can enhance student engagement and content connectivity, alleviating long contact hours in a first year undergraduate oral health program. As a case study, this work in progress will outline how a class Blog fosters student on-line communication as a social and study support system whilst they settle into university life.

Methodologies such as Integrated Online Learning Modules (IOLMs) are accessible to students in advance of the associated face-to-face (f2f) session to decrease contact hours and maximise the effectiveness of the f2f session. A Wiki-based assessment project is also undertaken as a group-based research project in an 'anywhere, anytime' context. There is a focus on the emerging positive impact that these collaborative online learning technologies are having on the flexible nature of a human biology course in relation to learning, assessment and progression rates within the course.

INTRODUCTION

The Bachelor of Oral Health (BOH) is a 3 year undergraduate program offered by the School of Dentistry, at the University of Adelaide. Since its inception in 2002, an average of 30 students have enrolled in first year with a significant number of mature

age students in each cohort. Students entering the BOH come from a wide range of educational backgrounds and vary in their levels of experience and confidence in using on-line technologies. As is the case for most professional courses, the BOH is delivered within a framework of long student contact hours. The Human Biology team was keen to alleviate some of the negative impact that these long contact hours seemed to have on student engagement. The aim was to provide effective online learning options that would offer students a choice of how and where their learning could take place, and a more effective means by which students could connect with the course content on a deeper and more meaningful level.

Higher education is experiencing a new era in the development of collaborative online spaces, making use of their 'anywhere, anytime' flexibility, the efficiency of reaching large numbers of students, and their ability to relate to an emerging generation of students who use social technologies for personal communication. Coincident with the growth of on-line education to encourage student engagement, flexible online spaces can also be used effectively to maximise meaningful learning through the use of online formative and summative assessment tasks. In any learning context there is wide consensus that assessment drives student learning (Donnan 1996, Hargreaves 1997, Kendle and Northcote 2000). When developing on-line education programs, assessment design should be the primary consideration to guarantee the online engagement of students. Iahad et al (2004) emphasise that whenever online learning material is offered, its' designers must examine the role of assessment and evaluation to almost ensure effective online student engagement. Further to this, Gibbs and Simpson (2002) promote the 'richness' of the feedback offered by an on-line assessment task, as it allows the students time and opportunity for reflection, increasing access and flexibility, and promoting a deeper sense of learning.

This paper will present the way in which three collaborative on-line learning and assessment initiatives have been used in a first year Human Biology course as an attempt to create rich learning contexts, enhance feedback to students, increase flexibility and connectivity with course content and create a culture of peer collaboration.

THEORETICAL FRAMEWORK FOR CREATING THE ON-LINE LEARNING ENVIRONMENT

Evidence-based approaches to developing effective on-line learning environments have been emerging in contemporary literature (McInnerney & Roberts 2003). Felder and

Brent (2001) encourage tertiary educators in first year programs to guide students into a more independent, but supported learning environment, which acts as a valuable 'initiation' into a post-secondary, more academic form of pedagogy. Oravec (2002) considers the potential of blog technology as a tool for the promotion of deeper learning on a number of levels. As well as being an online journal encouraging personal reflection, Oravec (2002) considers blogs as encouraging collaboration and developing analytical thinking in students through the formulation and sharing of ideas. Ferdig & Trammel (2004) see the value of the immediacy and commentary-based format of blogs to provide feedback to students, encouraging them to reflect and analyse as they construct their knowledge of the topic under discussion.

Setting up a Blog: Methodology, results and discussion

In the first year of the BOH, a class blog is set up for students using **Blogger.com** to foster student to student and student to teacher out of class communication. The blog acts an initial step to de-mystifying web-based social learning technologies for the less technologically savvy students and to foster collaborative learning relationships. Over the last 4 years these blogs have gradually transformed into vibrant peer-led 'off campus' learning forums where students actively discuss current and/or contentious learning issues. Teaching staff contribute by reinforcing the importance of student led discussions and provide ongoing feedback and guidance as necessary. The blog discussions are monitored through the site's RSS feeds, so that teachers can respond accordingly and in a timely manner. The importance of self reflection and peer collaboration is reinforced in every aspect of the online discussions. Over the last 4 years, these blogs have witnessed a trend where their use almost doubles during examination and assessment periods. Students use this forum as an integral part of their 'off campus' revision strategy to access the opinions of their peers and teachers in an 'anytime, anywhere' format. As a snapshot of emerging evidence, the BOHONE09 blog (n=36) started off with 5 discussion topics with an average of 4 – 5 posts each in March 2009, increasing to 11 discussion topics, with an average of 5-6 posts each in June 2009, correlating with exam revision periods. Similarly, the BOHONE08 blog n=33 (second year students in 2009) increased from 9 topics of discussion in March 2009, to 35 posts in June 2009, once again correlating with the students' study and mid semester examination period.

Image 1 is a snapshot of a series of posts demonstrating the students 'on-line' collaborative study sessions for a major examination. It demonstrates the collaborative nature of peer evaluation and feedback that this web tool has facilitated.

These students began this blog in their first year in 2008 and have maintained this blog in their second year of study. There was no compulsion for this to occur – students have continued to adopt this on-line social tool as a key part of their learning.

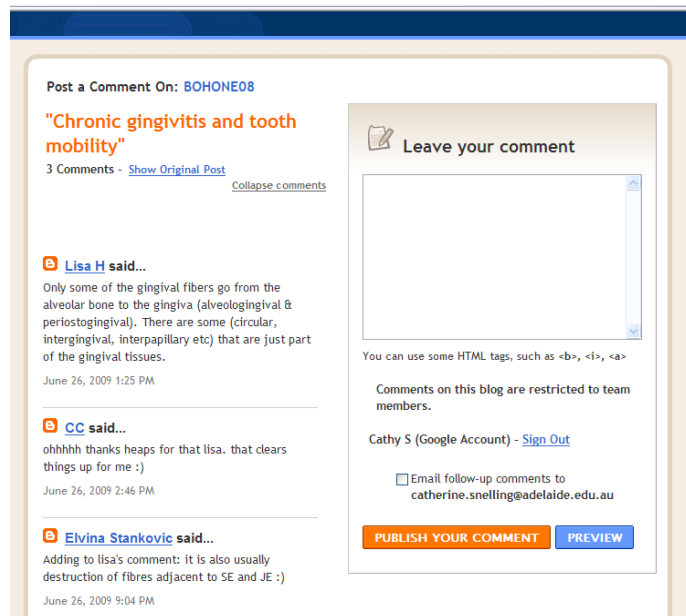


Image 1: Example of second year student posts on bohone08blog From <http://bohone08.blogspot.com/>

These patterns of ‘off campus’ blogging emerging in the BOH cohorts are suggesting that class blogs are becoming an integral part of the students’ learning, facilitated through peer and teacher feedback and achieving student engagement for at least 80% of each student group.

THEORETICAL FRAMEWORK FOR BUILDING ON THE ONLINE EXPERIENCE – USING INTERACTIVE ONLINE LEARNING MODULES (IOLMS)

To extend the use of blended learning opportunities and support students to make the transition from face to face (f2f) teacher dependent methodologies, the human biology team developed a series of Interactive Online Learning Modules (IOLMs), to build on the social learning culture that the class blogs initiated. These modules were designed around a “Just in Time Teaching (JiT)” pedagogy, pioneered by Gregor Novak, a Professor at Indiana University-Purdue Indianapolis (Novak, Gavrin, Christian & Patterson 1999; Marrs and Novak 2004) and served to actively engage

students in content connectivity prior to entering the classroom. Novak & Patterson (2000) demonstrate that at the heart of this teaching methodology is a continuous feedback loop that creates a collaborative and dynamic learning experience between the real and virtual learning spaces.

Felder & Brent (2005 p. 57) highlight that all students have “different backgrounds, strengths and weaknesses, interests and ambitions, senses of responsibility, levels of motivation and approaches to study”. They believe there is no one approach that addresses the learning needs of all students, all the time. Teaching methods that employ active learning methodologies and strive to minimise prior misconceptions contribute to the fostering of a “motivating deep approach to learning” (Felder & Brent 2005 p. 64).

Designing and developing the IOLMs: Methodology

To develop these IOLMs staff transferred existing lectures in PowerPoint format into the Articulate Learning Software program and uploaded them into the MyUni Blackboard™ (Microsoft Corporation) platform. The design and development of these online Human Biology modules enabled staff to transfer 33% to 50% of the f2f content to an interactive online forum to reduce student contact time and pace the learning through regular online formative checkpoints (Carrington and Green 2007). The learners’ responses to these Checkpoints, or ‘Warmups’ (Novak and Patterson 2000), were then collated by the Gradebook facility of MyUni and provided immediate feedback to both the students and the teachers. Checkpoints took the form of multiple-choice questions (MCQs) and/or extended matching questions (EMQs), and were regularly embedded in the module after each group of 4-5 presentation slides. This maintained regular student interactivity and a mechanism for students to monitor their own level of performance and understanding of the content. Students could preview and return to each slide as often as they needed to support the development of their understanding.

Complimentary to this, staff had access to a feedback mechanism that identified emerging learning issues that required further clarification. Students received immediate online feedback as to the accuracy of their responses, and could review the IOLMs in the ‘anywhere, anytime’ context promoted by Krause et al (2005). Teachers were able to analyse the cohorts’ pre-existing level of competence by identifying poorly answered or misunderstood checkpoints. The reduced f2f sessions

were streamlined by focusing on areas of greatest learning need and maintained the interactive learning nature exemplified in the IOLMs.

To support the interactive nature of these modules, teachers recorded audio soundtrack to accompany each slide using broadcast style dialogue to personalise the online experience for students. The dialogue incorporated investigative style questioning between the two speakers which was supplemented with a rich use of analogies and summaries to highlight the key learning areas. The project team were hopeful that the blended IOLM learning methodology provided the best possible medium where a diverse range of learner needs could be addressed, at least most of the times. A sample IOLM can be accessed through the following link:

<http://ajax.acue.adelaide.edu.au/~allan/embrology/player.html>

Designing and developing the IOLMs: Results and discussion.

Preliminary quantitative results from IOLMs course surveys, qualitative results from independently conducted student focus groups, anecdotal evidence from informal discussions and emails, and the high degree of student engagement in the f2f sessions, suggest that the majority of students preferred this blended way of interactive learning. An average of 88% of the student cohort completed the IOLMs on a regular basis prior to the scheduled classroom session. It was interesting to discover that students who struggled with key concepts previous to the implementation of the IOLMs were highly engaged in this learning experience with improved assessment performance in the topics delivered using this blended methodology. In summary through the various evaluation strategies mentioned above, students identified the following aspects of the IOLMs to be of most benefit to their learning. These included the:

- *opportunity to access the IOLMs 'on-demand' and at a time that suited their schedules on or off campus*
- *asynchronous availability of their facilitators, through the online collaborative dialogue embedded in the IOLM*
- *provision of immediate feedback on their level of performance*
- *opportunity for students to attend the face to face session with the same level of understanding, arming them with the confidence and underpinning knowledge needed to engage in the application and integration of their conceptual understanding in the classroom environment*
- *identification and reinforcement of key concepts in both the online and f2f experience*

- *ability to contextualise and make sense of their learning through both independent reflection and collaborative peer group learning*

THEORETICAL FRAMEWORK FOR DEVELOPING AN E-ASSESSMENT: OUR WIKI PROJECT

Learning outcomes fostering independent and peer group investigation as well as finding a means of reducing the need for students to meet f2f for group work, determined the choice of the wiki as the summative assessment tool for a Human Biology group project. Guy (2006) promotes the use of wikis in education as they support sharing and collaboration, are ideal for group project work and peer-to-peer activities. They allow students to work on specific activities and are good for reflection on written work through critical self-assessment and peer evaluation. Boud (1995) identifies the importance of developing the students' ability to self assess as the most valuable tool of their professional careers. Chickering and Ehrmann (1996) saw online social learning tools as particularly important for "shy students... reluctant to ask questions or challenge the teacher directly.....providing opportunities for interaction not possible in class." The importance of well-organized, clearly expressed orientation to web based social learning tools is well also documented (Oliver 2001; Guy 2006). Campbell (1997) encourages on-line course designers to create Course Sites with explanations, descriptions, and cues about goals and accomplishments, as students "prefer clearly defined learning outcomes, or tasks, and recommended sequencing, from which they can orient themselves at any time."

Whilst the use of on-line learning technologies may be viewed as a means of eliminating or minimising the role of the teacher, educational commentators recognise it as never being more important (Guy 2006; Fahraeus et al 1999, Chickering and Ehrmann 1996; Harasim 1995). Effective on-line facilitation can provide ongoing guidance, formative feedback, motivation and high-quality communication between teachers and students, all of which are critical in developing assessment tools for learning, through student input and perception of relevance. Chickering and Ehrmann (1996) stress the importance of prompt feedback in on-line learning – as they succinctly state "knowing what you know and don't know focuses your learning"

Wesley (2003) states that rubrics are ideal for assessing "student learning in areas that are often vague and/or complex", providing teachers with an assessment tool that is "more efficient and defensible" and students with a tool to "better grasp ... what is expected at different levels of quality and performance" and consequently "paving the

way for achievement and success.” Chickering and Ehrmann (1996) in their article discussing best practice principles in on-line education, specify “good practice communicates high expectations”. Montgomery (2002 p 35) verifies this by stating that, “process, progress and product may all be evaluated by means of rubrics” as well as serving as an effective tool for “peer review tasks” and self-assessment.

Designing and developing the wiki project: Methodology results and discussion

To orientate the students to the wiki learning/assessment task using *Wikispaces.com* a teacher developed home page, entitled “A Wiki on How to Make a Wiki” provided details of the learning and assessment task and instructions on how to use the wiki site. Hyperlinks to exemplar wiki sites and past student work were included on the home page to assist in the orientation process. Students were invited to join the wiki to actively contribute to their group’s page. There were two e-facilitators allocated to this project with the joint responsibility of overseeing six groups of 3-4 students each. Both e-facilitators collaboratively developed the initial wiki page, the wiki project outcomes and the online assessment rubric. This provided an opportunity for the e-facilitators to calibrate their approach to overseeing the online learning and assessment process having been involved in the collaborative development and implementation of the project from its onset. The home page and student wiki pages can be accessed on the following link: <http://bohoney09.wikispaces.com/>.

Regular facilitator ‘visits’ to the page occurred once or twice weekly, reducing the need for students to meet with facilitators f2f. Students were encouraged to keep in contact with their e-facilitator via the message board on the wiki page or by email. Once the initial framework was created for each group in collaboration with their e-facilitator, the learners themselves drove the wiki’s scope and content. The decision to use an online rubric to assess the group’s research task was based on previous successful uses of rubrics in classroom-based assessment tasks. Whilst the wiki tool promoted a sense of collaboration rather than competition and reinforced a flexible learning environment, the rubric provided explicit criteria on the importance of inclusive and equitable group work. This online collaborative research project modelled a collegial approach to lifelong learning by maximising self and peer evaluation. Consequently the assessment designers were confident that this learning and assessment methodology introduced the process of peer review in a first year undergraduate cohort. The online rubric was also modelled against the Research Skills Development Framework for undergraduate students developed by Willison and O’Regan (2007).

Initial qualitative data of students' perceptions through a formal course survey highlighted the following aspects of the wiki as being the most enjoyable:

"seeing visual progress"

"peer encouragement provided the enthusiasm to learn"

"strive to do your best not to let the group down"

"peer supported learning"

"able to motivate each other"

"we made the most of everyone's strength"

"peer appraisal"

"easy access to facilitator"

"wiki stimulated social chat"

"there was no leader. We all felt like equal members"

The e-facilitators noticed a trend of increased engagement from students who were normally more reserved during class sessions. This was evidenced through the number and the quality of contributions that the normally more 'quiet' students were involved in as their confidence was nurtured in a small online group environment.

Where students did report less favourable feedback, it applied primarily to the limitations of the technology:

"Formatting limitations"

"Can't save changes at the same time"

"Need a more 'snazzy' looking wiki"

"Platform was not always 'user friendly'"

"Limited tools and functions- limits creativity"

As wiki functionality continues to evolve, it is envisaged that these issues will be less contentious, as the benefits in terms of student learning and assessment are clearly evident.

FINAL EVALUATION OF FLEXIBLE LEARNING SPACES

Evaluating the impact of these social learning tools on student grades is a critical academic activity. If there is no measurable improvement in student performance, then the question must be asked – is the approach enriching the learning and teaching experience within a program? Results from the Human Biology stream (subject)

where the blog, wiki and IOLMs have been used extensively are encouraging, albeit over a small number of cohorts at this stage. In the Embryology topic where IOLMs were first implemented in 2008:

2007 Results from the Embryology Exam (no IOLMs in course):

Class average 66.8% (level of achievement)

2008 Results from Embryology Exam (IOLMs in course):

Class average 70.1%

2009 Results from Embryology Exam (IOLMs in course):

Class average has been maintained at 71%

The wiki was implemented in 2007 as the platform for a group-based research project that had previously been undertaken along more traditional 'off campus' lines. There has been an increase of more than 6% for the median group mark for the project between 2005 (74.2%) and 2008 (80.1%), 2009 (80.3%). However, the high level of student satisfaction rate for the use of wikis in education can be determined through the qualitative results from the course Student Evaluation of Learning and Teaching (SELTs), which demonstrated an average of 92% Broad Agreement across two student cohorts when asked if wikis played a relevant role in learning & assessment.

CONCLUSION

There is no doubt that on-line learning environments have become an integral feature of contemporary higher education. Our experience in implementing social online learning methodologies in human biology has been a positive one, but needs further data to validate their ongoing effectiveness. Initial results indicate a very high level of student satisfaction and engagement in the use of social learning tools such as wikis and blogs. The interactive online learning modules that focus on the human element in a virtual learning space, help to reduce f2f contact hours and provide greater access and flexibility to learning. It must always be at the front of any course designer's mind, that these technologies should not drive nor dictate the learning tasks and assessment strategies – rather they should facilitate a platform that is characterized by a robust feedback loop that is the hallmark of a learner-centred paradigm.

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