

Innovation and flexibility within a Bachelor of Information Systems transnational educational (TNE) program

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Abstract

The Bachelor of Information Systems program is jointly delivered by the University of Tasmania and the Shanghai Ocean University. To ensure content relevance and improved student engagement the teaching team has developed an innovative combination of technology placement and teaching pedagogy. The innovative interventions to real contractual and resource constraints presented in the delivery of the program focussed on engaging students, aligned use of technology and creating a quality learning experience amongst students that were studying offshore. By challenging our assumptions, adopting a technology supported just-in-time teaching approach informed by a collaborative team teaching philosophy we have been able to pilot and then roll out program wide innovative solutions to units within the program. The initial outcomes are promising with improvements in both student engagement and student achievement.

Keywords Information Systems Education, Transnational Higher Education, Teaching Innovation, Technology supported Just in Time Teaching, Flipped Classroom.

1 Background

In 2002 a transnational bi-lateral agreement was signed between the University of Tasmania (UTAS) and the Shanghai Ocean University (SOU) and included the establishment of an International Education Institute within Shanghai Ocean University (AIEN SOU). The joint venture enabled Chinese students the ability to study a double degree; the Bachelor of Management (BManagement) in Mandarin delivered by SOU, and the Bachelor of Information Systems (BIS) in English delivered by UTAS. The model is four plus zero with no transfer to Tasmania as a component of the degree. UTAS prepares all the materials for the unit it delivers into the BIS degree and it is taught using western teaching methods. Students therefore study their Chinese degree with a chalk and talk approach while simultaneously are expected to study the UTAS degree by more collaborative styles of learning.

The objectives of the Bachelor of Information Systems (BIS) program were clear from the outset. A very forward thinking Chinese Professor saw the need for Chinese graduates to be challenged in their thinking. He wanted to produce graduates who could think independently and be better equipped to progress China in the new global economy. To that end the degree was primarily chosen for the capstone units but also for the units that involved strategy and innovation. The UTAS program was to be taught in partnership with AIEN SOU staff and to be based on the units taught onshore at UTAS with modifications made to adapt to the local conditions and the program constraints.

2 Innovation in Information Systems (IS) learning and teaching

This is an exploratory study that uses both formal and informal correspondence and semi-structured interviews, UTAS eVALUate surveys, and de-identified unit results. Our innovative interventions to real contractual and resource constraints presented in the delivery of the BIS focused on engaging students, aligned use of technology and creating a quality learning experience amongst students while studying offshore. By challenging our assumptions, adopting a Just in Time (JIT) teaching approach informed by a collaborative team teaching philosophy we have been able to pilot and roll out program wide innovative solutions to units within the program. As presented in the following sections, the innovations have been focused on both technology and delivery with the aim of improving engagement and student exposure to the BIS content. These innovations are ongoing, with promising results to-date.

2.1 Teaching Philosophy

The teaching team has a hybrid teaching philosophy that embraces three components: *active and co-operative learning practices* (Smith et al 2005) embracing teamwork and self-directed learning (Tsay & Brady 2012); *teacher as innovator* (Wood 2003) in the deliberate adoption of alternative learning and teaching practices and leading by implementing change, rather than following change (Smith 2012); and *reflective practice* (Light et al 2009) with the reflection being staff-driven towards our own teaching practices (Atkinson & Bolt 2013; Biggs 2001).

Active and co-operative learning as a teaching philosophy has meant that we have employed both technology and delivery based strategies to engage not only the students but also our partner staff delivering the program (Tsay & Brady 2012). Students are interacting with unit content via a JIT classroom model and this has required skill development from the local staff and students. Through operationalising our teaching philosophy, the teaching team gained active contribution from the students using a flexible approach to teaching so that class outcomes are achieved in a way that is student directed (Watkins & Biggs 1996). The JIT learning approaches have facilitated class preparation and expanded on that content within class (Smith et al 2005). This facilitates group learning and sharing, with the educator acting as the facilitator (Smith et al 2005) rather than the traditional lecturer.

A strength of the degree is the use of technology based innovation to support the delivery, engagement and relevance of the content to the students. ePortfolios and MyLO (the UTAS content management system) based quizzes and discussion boards are the core technology used in the degree and whilst the actual technology is not innovative in itself, the placement and use of the technology has required innovative practice to ensure success. The technology is supporting the JIT and flipped classroom approaches and creates greater cohesion between the theoretical content and the practical application of that content (Tsay & Brady 2012).

2.2 Technology Based Innovation

Innovative practice has been the driver of the placement of technology into the BIS degree to achieve continuous quality improvement. Integrating web 2.0 technologies within Information Systems higher education provides relevance and flexibility (Kane & Fichman 2009). The use of JIT and flipped

classroom teaching (where work is prepared before attending class and then expanded upon) approaches requires a careful combination of lecturer based and technology based innovations in order to ensure the Intended Learning Outcomes of the degree are achievable and provide relevance for the students when they enter the workplace (Biggs & Tang 2011). The success of the flipped classroom approach is closely linked to technology use. Alignment between the need for technology and the desire for technology needs to be carefully monitored (Millis 2012.). How often has industry been cautioned about the use of technology for ‘technologies sake’? The same must apply to the use of technology in assisting students to achieve higher education learning outcomes within an Information Systems context.

Cultural differences in student learning and interaction were also a challenge that technology provided an innovative solution for. Students trained under a Chinese education system are accustomed to passive or no interactions in class along with a reliance on rote learning (Ellis, Roehrer & Kelder 2013). In contrast, the BIS relies on students becoming critical thinkers as they progress through the degree. Dealing with the duality of Eastern Vs Western has been an ongoing teaching challenge for us as we require demonstration of understanding rather than simple rote learning. As reflective practitioners and innovators we sought inspiration from JIT teaching practices and adapted these with co-operative learning techniques to suit the uniqueness of our AIEN SOU students.

Technology supports the final two 3rd year units of the BIS in adopting a group work approach in the tutorials, with students acting as leaders in independent learning groups and the lecturer acting as a facilitator. Both these units are taught remotely, supported by two teaching visits where the UTAS staff work intensely with the students to ensure they are achieving their milestones and the groups are working effectively. Group work is ideal for ensuring a diversity of skills, yet group marks are not as desirable (Ellis, Roehrer & Kelder 2013). The units have adopted the use of ePortfolios to gather evidence of individual contribution to group work to check that each student has achieved the Unit Learning Outcomes and contribution to the group. This successful innovation was developed for an on shore unit (Ellis, Roehrer & Kelder 2013) and ensures individuals are allocated marks based on evidence.

In the delivery of one of the 3rd year unit a blended mode of delivery was adopted (face to face workshops and weekly modules of online material on MyLO along with a textbook). Three of the five workshop tasks are completed in advance of the workshop and the remaining two tasks completed during the workshop in the group. The main assessment task involves students investigating the implementation of ICT in an organisation and writing a Business Case evaluation of an organisation decision, this is a group task. Assessment tasks are stand-alone and each assessment uses Criterion Referenced Assessment (CRA). The design of the CRA rubric for the Business Case group assessment task focused on the students’ ability to develop and present a business case based on rigorous research. The second criterion “Evidence in ePortfolio” was devoted to the students demonstrating their participation in the group work. The aim of the ePortfolio is threefold: for students to provide evidence of individual contribution to the group assignment on the basis that the sum of the parts must be greater than the whole; for student to demonstrate their skills in using ePortfolios to provide evidence in a way that facilitates ease of evaluation and; documents that students have reflected on their learning journey.

A recent change in 2014 was to better utilise online quizzes via MyLO as both a form of teaching and as an assessment tool. With large classes online automated quizzes are very attractive however when investigating the deployment of quizzes it was evident that “correct answer” multiple choice quizzes were being used. Through using “correct answer” multiple choice quizzes students were not required to demonstrate understanding of the topics, they simply demonstrated their ability for rote learning (Burton et al 1991). On average the students were achieving 97% for quizzes in their units. Research clarified that students had 1 out of 285 chance of getting 70% or higher score by ‘blind guessing only’ the correct answer (Burton et al 1991). More importantly the quizzes were simply encouraging rote learning rather than testing understanding and comprehension. This did not align to our co-operative learning teaching philosophy. At one of our bi-annual meetings where we reflect on and share best practice while investigating issues with all staff involved in teaching into the program, we introduced research conducted on ‘Best Answer Quizzes’. *“Best answer questions are designed to have the student identify the correct answer, just because the student knows the incorrect answer does not imply they actually know the correct answer. In terms of best answer, the alternative differ in the degree of correctness. Some may be partially correct but one is clearly more correct than the others.”* (Burton et al 1991). Best Answer questions are now the standard for the BIS program. The multiple choice question component of the units now examines understanding and comprehension and not rote learning. This change has resulted in the average mark of quizzes being reduced to 78% from 97%. The quizzes challenges students to think about the material at a deeper level and quiz results now have greater alignment to the students’ overall achievement of learning outcomes.

Interacting with students in Shanghai from Tasmania introduces challenges of time, distance and connectivity. MyLO is a means for students to connect with educators however the typical use of MyLO means interaction is delayed, lecturers and students post topics and then wait for the reply. Such use of MyLO discussion boards lacks innovation but fits the intended purpose. The need for connectivity led to the introduction of a 'live chat' discussion time. Students and the educator log onto the discussion board at the same time, for a defined time period thus reducing some of the lost connectivity. Whilst the concept of face-to-face is not easily replicated, the reaction time and response to real time conversation utilised the discussion board in an innovative way. Students regain connectivity and the resource strain is not increased on the program or the student. Additionally, the use of the discussion boards in a 'live' situation demonstrates that not all innovations need to be big. The BIS students benefit from the unexpected use of technology, providing experienced examples for innovative ICT use. The technology ties together a teaching need in order for students to better achieve the intended learning outcomes.

The 'live chat' session were successfully piloted during two second year units and the positive response from lecturers and students has created a thirst for greater interaction between Tasmania and Shanghai. The pilot results indicate that prolonged student interaction through MyLO has increased by 33.33% with a greater average interaction rate with unit content (76.08% content accessed compared to 58.97% content accessed in previous deliveries). The next step is to move outside the comfort zone to create the final level of virtual contact. Interaction between students and lecturers will be via a virtual classroom where the lecture is streamed live and students can place questions in real time. The use of this technology, whilst straightforward in Australia, is difficult in mainland China. Bandwidth and government regulations create obstacles that will require pedagogy innovations as well as technology innovations so that content is not solely dependent on the virtual classroom.

2.3 Pedagogy Based Innovation – Just In Time (JIT)

In addition to technology based innovations we developed pilots that focused on learning styles. In the early years of the program, the AIEN SOU classes were supported by class monitors who reported on student attendance and behaviour to the management of the institute. Class monitors would be sent to get students out of bed if they did not attend an early morning tutorial. As the degree became embedded at AIEN SOU one of the changes we observed was the reduced influence the classroom monitors had on the classes. This caused tutorial attendance, especially early morning tutes, to decrease. The lack of attendance and the imbalance of tutorial numbers had to be resolved.

The solution to this had its foundations in a change implemented by one of AIEN SOU lecturers. Frustrated with the lack of discussion in his tutorials he insisted that the students must complete the tutorial work prior to attending class. Students were to provide dot point answers to the tutorial questions on an A4 sheet of paper. The paper was to be handed in at the end of the tutorial. This approach had the dual effect of preparing the students for the tutorial and providing evidence of attendance. Reflecting on this simple idea we saw an opportunity to take this initiative, expand on it and use it to finally resolve the low attendance at tutorials. There was a reluctance to impose measures that mandated attendance rather than participation. An additional concern was the workload involved in any solution that involved recording student attendance. Tutorials were already short in length so valuable time was not to be used taking attendance for classes of 50 students.

We further developed the lecturer's idea into a JIT approach. Students were to complete the tutorial work in advance of the class. They were required to submit the work to MyLO prior to attending class and only attend the class they had been allocated to. The pedagogy behind the use of the technology was learner centred, students would prepare before the class and in the physical submission of the work they were creating ownership of their learning activity (Watkins & Biggs, 1996). The positive influence towards student engagement, collaboration and flexibility of student learning further informed our technology approach in the IS context (Jimoyiannis et al 2013). The technology created the repository for the work along with the analytics for student participation. In class the students were called upon randomly (AIEN SOU staff were upskilled so students could not guess who might be next) to answer the questions for that week. Students were then marked on the quality of their answer, which was a component of a 20% participation mark now in the unit. If they were not in class when they were called they received zero, if they had not completed the work they received zero. This innovation resolved the lack of attendance and provided the basis for students to engage in class. The early experience of this pilot was successful from an educator perspective, with the local lecturer commenting "*I don't have to allow them very long time to read through the case - I gave them 1 min to quickly go over it and this really saves a lot of time considering tutorial is only 45 mins long. The majority of them are able to*

answer questions when called.” The success of expanding on the original concept was further evident during a UTAS teaching visit. The students were correcting Data Flow Diagrams of other students and outwardly enjoying the experience. The JIT approach was subsequently implemented in the majority of units (more technical based units were exempt from this initiative as the work needed to be carried out was in supervised lab sessions) in the program along with a participation mark. Initial feedback and eVALUate (formal student unit feedback) results has supported the program pilot of this innovation.

The changes in tutorials led us to think about lecture delivery. The use of power point software is common in the BIS program and is consistently used to disseminate theoretical content. Unfortunately, this delivery method suffered from overuse and students were no longer the beneficiary of focused content. Students consistently complained about boring lecturers and too many slides. While these concerns had been addressed by the reduction of slides it was clear there were further opportunities for improvement, especially in relation to units that had prescribed texts or readings. The students were expected to read the material provided so why repeat that information in depth again in the lecture.

The solution was to develop the lectures as an overview of the key points of the week’s reading, no more than 10 - 15 PowerPoint slides. Technology was distracting students from the application of the theoretical content and so the dependence on the PowerPoint slides was removed for actual delivery. The remaining lecture time used a Problem Based Learning (PBL) approach (Wood 2003) with a case study that was presented in week one and expanded on each week after that. The lecturer would provide answers to questions posed with the weekly case study and explain to the students how they (the lecturer) came to those answers. A partner staff member implemented an additional change by trying to engage the students in the lecture before presenting her reasoning and answers to the questions. We based this innovation on a ‘think aloud methodology’ which asks for the verbalisation of thought processes (Makri et al 2011). The questions related to a case study and were scaffolded week by week, connecting the content to the module outcomes (Herreid & Schiller 2013). The intent was to overtly teach case study analysis as a part of the degree. The alignment of the case material to the unit content has shown a positive impact in increasing student achievement of the unit learning outcomes and further exploration of these results are currently underway.

3 Innovation Initial Outcomes

One of our major goals has been to impact student learning and student engagement. We have achieved this goal by adopting some innovative teaching practices that have been supported by technology to better connect with the students from thousands of miles away. The BIS not only utilises technology in the delivery but promotes the innovative use and placement of that technology. ePortfolios ensure students contribute to group work, if they do not contribute, then they receive no group mark. JIT delivery has engaged the students in tutorials; we had not been able to achieve this successfully until this innovation. Expanding on that with the PBL approach to lectures and ‘think aloud’ techniques to help teach skills that these students did not have and badly needed is starting to have an impact. A minor change in the quizzes now means students have to engage with the unit material to be successful. These suite of changes map to real innovation and result in engagement and better learning outcomes. Student engagement has been positively impacted, participation in the unit eVALUates has risen from 11.76% to 41.67% since the innovations have been introduced. Student agreement on the question; *The learning experiences in this unit help me to achieve the learning outcomes* has increased from 90% to 96.10%.

4 Conclusion

By coming together as a dedicated team that passionately believes in this program we have been able to pilot change at a unit level and then transfer that success to the whole program. The pedagogy behind the use of the technology was learner centred, creating ownership of their learning activity. The innovations have been focused on both technology and delivery with the aim of improving engagement and student exposure to the BIS content. This process reflects ICT project implementation and involves the students in the actual process. Innovation is implemented and adjusted according to feedback. This approach has greatly benefited the students, staff, the program and both partner institutions. The impact of the changes implemented with the delivery of the BIS has resulted in the students and our partner staff moving much closer to experiencing a true Western style program. More importantly the innovative use of technology and pedagogy in the BIS has created greater levels of student engagement and applied relevance. Overtime our partner staff have become up skilled in Western Teaching practices and no longer simply teach the materials provided by unit co-ordinators but work in partnership with them. We strongly believe that our actions to date have had significant impact on the program. The

program continues to produce quality IS graduates that are better equipped to continue their education and participate in the international economy. The partner institutions have continued to receive recognition for this quality program. We look forward to the future outcomes of our efforts as we move through to a formal review of the BIS program.

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