e-Learning to Aid International Student Transition
A Case Study
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Abstract: The number of International Students at Australian Universities has grown substantially and this has been beneficial to University communities. However, this presents some challenges due to the diverse backgrounds of incoming students. Areas of diversity include English language skills, cultural backgrounds, technical knowledge, IT skills, exposure to e-learning, learning experiences and expectations. In order to address these issues, we have introduced an Experimental Design Module that is done at the beginning of semester. The students work towards producing a written piece of work but the process is divided into a range of integrated exercises. Through these exercises, the students are introduced to a range of e-learning tools such as discussion boards, e-quizzes, online lectures and tutorials. In the process, they get to know other students in the class which helps with social integration. They are also shown some examples of Australian professional communication skills and get to practice using them. All of the exercises improve their scientific English language skills. This exercise has improved independent learning and performance in the topic.

Keywords: Transition, International Students, English Language

Introduction

THE GROWING NUMBER of international students at Australian Universities has benefited the academic community by encouraging diversity and by providing opportunities to globalize the on-campus experience. The notion of globalized universities preparing internationally knowledgeable and competent academics and graduates to address the interdependent nature of the world has further supported encouraging international students to study at Australian higher education institutions (Welch, 2002).

However, international students are faced with an often dramatically different environment on arrival at a new University (Guilfoyle, 2004, Gauntlett, 2005). All beginning students, regardless of their ethnic and cultural backgrounds, have to adjust to understanding the academic culture of the university and of the discipline. ‘Societies are governed and operate under a consensual norm, a set of habitual consecrated daily routines and taken for granted rules of law and codes of behaviour that everyone follows as a given. In education the parallel is the underlying structure of bureaucracies (schools) – the rule driven, culture laden, role determined and followed teacher, student and community understanding and cultural assumptions about schooling’ (Slater, 2000).

The process of learning about, and feeling secure in, the new environment takes time and is known as transition (Guilfoyle, 2006). While transition stress is common to all students, international students have to grapple with these adjustments in addition to the challenges of transition to an alien culture. Transition can be faster and less stressful if appropriate programs are provided for incoming students (Guilfoyle, 2004). Furthermore, timely and effective transition programs can improve student academic performance (Jolley et al., 2004, Wesemann, 2005).

This paper describes an intervention program utilizing a range of e-learning tools developed to support the transition of international students engaged in the Masters of Biotechnology Studies program at Flinders University of South Australia.

The Program

The Masters in Biotechnology Studies is a two year award program. The course consists of one year of coursework followed by a year of research in a professional Biotechnology laboratory generating results of a standard that could be published in scientific journals. The Masters of Biotechnology Studies degree is heavily orientated towards practical skills - half of the study units for the course are laboratory based. As a result, many of the activities and assessment require data analysis. The data analysis and graphical presentation is expected to be completed using generic software, especially Excel.
The Students
The student cohort comes from a range of countries including India, China, Indonesia, Zambia, Vietnam, Malaysia, Sri Lanka and others. Students are required to have a three year degree in a scientific field from a tertiary institution prior to admission. As all of the students have already completed a tertiary degree, they arrive in Australia with clear expectations of what a University is, its modes of teaching, the study skills required and what constitutes acceptable behaviour in an academic setting. What they find is not necessarily what they expect, which gives rise to a series of specific issues the program curriculum developers need to address.

The Issues

Self-Directed Learning
A major emphasis is placed through the coursework on preparing students for scientific research. In Biotechnology, research is viewed as a largely self-directed exercise in which researchers learn from their own results and generate the next challenge. This viewpoint is in contrast to other pedagogies that focus on learning the material provided by the coordinator.

Skills-Based rather than Content Driven
Most incoming students arrive with an emphasis on knowing certain ‘facts’. In contrast, the modern scientific method relies on the ability to use current observations to generate new theories. Therefore, the educational emphasis is on the development of skills such as experimentation, hypothesis generation and communication of ideas. This is manifested as a major shift in assessment methods away from exams and towards analytical, innovative and communicative exercises. This pedagogical shift is often contrary to international students’ expectations and their experience of assessment.

Continuous Assessment & Time Management
In order to develop and assess skills and give timely and applicable feedback, the courses are generally divided into a range of short exercises, spreading the assessment out across the semester. For students who have come from final-exam-based assessment systems, the shift to continuous assessment means that they have to learn time management skills that they may not have acquired at their previous tertiary institution. Many students are also new to doing part-time paid work whilst studying and this places an extra strain on their time management skills. Consequently, students may need to be taught how to manage multiple demands at once and to plan ahead for the next deadline.

Questioning/Critical Thinking
In some cultures, questioning the opinion of an authority figure (such as a lecturer or author) is unacceptable. In contrast, Australian lecturers invite questions during lectures, ask students to critically review the literature and promote a culture of debate.

Seemingly Casual Atmosphere
Australian culture appears to be very informal on the surface. For example, international students in the course reported confusion regarding differences in dress code and modes of address. Dress codes at some international colleges ban the wearing of shorts. In addition, students are usually required to address their lecturers as “Sir/Madam” in many countries whereas Australian lecturers generally ask students to address them by their first names. Australian society does have rules and behaviour conventions which may not be initially apparent or easy to discern for international students. The lack of clear guidelines of behaviour can lead to students behaving inappropriately or, more commonly, not speaking at all for fear of saying the wrong thing.

Diverse Prior Knowledge
In contrast to local students who have generally recently graduated from a standardised high school curriculum and have readily identifiable assumed knowledge, international students frequently display a varying level of subject knowledge and discipline-specific skills on arrival.

Experience shows that the level of Excel competency in each student intake has varied enormously - from those who are capable of doing all assignments set through to those who have never used Excel for data analysis of any sort. When new students are asked if they can use Excel, most will confidently answer “Yes.” However, if the question is adjusted to “Can you use Excel to calculate the mean of a set of numbers?”, then the answers will vary. In conversations with these students, it seems that some are taught how to use Excel for information display purposes but not for data analysis. For example, one student said that she did the calculations using a calculator and then entered them into Excel for her assignments.

English Literacy Levels
Variable English language skills are a further issue. While all students must obtain minimum scores in
English proficiency tests in order to receive an offer, these tests do not always reflect actual proficiency (Bayliss and Ingram, 2006). They also do not examine discipline-specific language. In particular, new students may have good conversational English but be unaware of the conventions of scientific English. Also, the students are asked to debate ideas, voice opinions and critique other viewpoints and this requires subtle linguistic skills in order to be done effectively without giving offence. Therefore, further English language training is required.

Social Connectivity

While Universities increasingly provide activities and student societies to help international students form social connections, students spend much of their time on campus in classes involving discussion or group work. Study programs therefore provide an opportunity for students to develop social networks. Studies indicate that international students expect a high level of contact with local students and that this intercultural contact has significant social and academic benefits for the international student (Ward, 2001), particularly in terms of smoothing international student transition and diminishing the impact of culture shock (Schneider, 2006). However, intercultural communication may not occur spontaneously. The course or program coordinator, therefore, has a role to play in helping students to form social networks.

In summary, curriculum developers aimed to address the issues of equalising the standard of computing skills for all new students; introducing students to the Australian style of University higher education and social structures; improving English language skills; providing training in time management skills; and making students feel welcome in a new country by meeting others in the course. All this while still acknowledging the diversity of the cohort in terms of ethnic and cultural backgrounds, abilities and prior skills.

The approach taken to address these issues relied on e-learning tools. These tools were integrated into the intervention in order to facilitate development of computing skills, encourage independent learning, and allow students to progress at their own pace. Also, prior studies have shown that international students prefer to use computers for learning during their first year (Zhao et al, 1995).

The Intervention

The approach used was to develop an “Experimental Design Module” to be completed at the start of the topic (or study unit) Advanced Experimental Biotechnology. The module focuses on introducing a threshold concept pivotal to Biotechnology. As defined by Meyer & Land (2003), a threshold concept “represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress.” The threshold concept in this case was the scientific method. The scientific method as a concept is fundamental to the profession, defines the expectations of the course, and illustrates why the students need to develop the core skills they are required to learn. In particular, understanding the scientific method transforms the student from a passive receiver of knowledge to a generator of novel theories.

This module occurred in the first three weeks of semester. It was designed to incorporate a mix of face-to-face and online teaching methods in order to facilitate independent learning, social and IT skills development. The module was divided into steps and clear instructions were given on the e-learning platform WebCT as shown below. Students were directed to the WebCT help desk in the library for help with accessing the material. Some parts of the module were assessed.

Breaking the exercise into smaller pieces addressed the specific aims of the intervention. Firstly, e-learning modules that are broken into smaller exercises are more effective (Gibbs and Philip, 2005). Secondly, the plan of activities showed how each exercise related to the others and therefore made each exercise relevant. Finally, there was a due date for each component. Some of the dates were deadlines for assessable activities while others were suggestions as to how to structure time in order to ensure timely completion of tasks. This strategy demonstrated to the students how to organise their time and manage continuous assessment.
One of the first steps was an Excel aptitude test. This did not form part of the assessment. It consisted of a simple graphing exercise which enabled the staff to quickly identify which students lacked the necessary Excel skills and required additional support. Further, it clarified for students what staff expectations were in terms of standards and skills. Any student who failed the Excel aptitude test or did not attempt it was enrolled in the International Computer Drivers Licence (ICDL) (http://www.acs.org.au/icdl/) course. This is an online course and the students were encouraged to do the other modules offered (e.g. PowerPoint), not just Excel. Feedback from the students indicated that they did use ICDL to learn more than just the Excel component. The key insight from this exercise was that a simple aptitude test on one software application assisted in the identification of students with poor general computing skills. Furthermore, those students need to be provided with access to a support course that offers a wide range of computing modules, not just the one problem area identified.

The next step was the face-to-face tutorial at which the students were given name tags in order to help them get to know each other during the tutorial. This enabled the students to meet each other in person before moving to an online discussion setting. At this tutorial, students were divided into discussion groups and it was largely interactive. Each group was given a chance to discuss problems amongst themselves and then present their conclusions to the class. This tutorial introduced the threshold concept of experimental design and also acted as a social activity.

The ensuing activities were largely online and began with the students listening to a 12 minute Flash media background lecture (prepared using Adobe Captivate). The aim of the background lecture was to set the scene for a scientific problem for which the students would need to design an experiment. As well as providing an animated lecture with audio, a transcript of the lecture was made available. Interestingly, in a class of 20 students, the flash lecture with audio had 146 hits (10min40s per hit) while the transcript received 119 hits (7min46s per hit). This activity showed that students listened to the online lecture multiple times and they usually listened to the whole lecture. The number of hits for the transcript probably under-estimates the usage as some students printed the transcript. The high number of hits indicates that the students were reading the transcript whilst listening to the lecture. This suggestion that students were using the lecture as an English language learning exercise as well as a scientific one was confirmed by the students. This case illustrates the advantages of providing both oral and written versions of material online.

Another aim of this module was to get the students to use computers in an interactive manner. To achieve this aim the class was divided into groups of 5 to participate in online asynchronous discussion groups. An asynchronous discussion board was chosen as research has indicated that asynchronous communication enables students to think through and plan their response and also gives students new to communicating online in English time to prepare their comment (Wang, 2006). The exercise also provided an opportunity to reinforce the face-to-face introductions from the tutorial. Discussion board
logs and archived messages indicate that students used this board to continue discussions from class, and to support each other through answering of questions and offering comments. As students became more familiar with each other and the technology, the transcripts indicate that students increasingly used the board for social activities rather than just studies, including posting photographs of each other by the end of semester.

For this exercise, the students were asked to post their experimental design plan on the discussion board and then give the other members of the group feedback on their plans. The students were then assessed on the quality of the feedback they gave each other. This exercise introduced the students to the concept that there is not always one right answer and therefore debate is necessary. It also forced the students to criticize each other’s work but in a structured and fair manner. Furthermore, doing this exercise online, rather than face-to-face, facilitated the critical feedback process for those from non-confrontational cultural backgrounds as the online forum was less personal.

In order to ensure that the feedback was given in a sensitive manner, there was a preliminary online formative quiz on “Giving Constructive Feedback” (see below for an example question).

Example Question: Giving Feedback Involves Describing One’s Own Reaction

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you give someone feedback, you are personally reacting to something they have said/written/done. Therefore, the comments can be about you and use words like: I, we, us. Using the first person achieves a few things. Firstly, it gives the receiver more choice about whether or not to accept your comment. Secondly, it is less aggressive. Finally, it makes you think about whether the problem lies with the other person or yourself. This question contains a list of possible feedback comments. Choose 3 that focus on the person GIVING the feedback.</td>
</tr>
<tr>
<td>1.  I think you are wrong.</td>
</tr>
<tr>
<td>2.  Could you please explain this section to me?</td>
</tr>
<tr>
<td>3.  We would have added the buffer first.</td>
</tr>
<tr>
<td>4.  What did you do that for?</td>
</tr>
<tr>
<td>5.  I don't understand why you did that.</td>
</tr>
</tbody>
</table>

This quiz introduced the students to an online assessment tool, developed English language skills and introduced the students to Australian cultural standards of professional communication. The students received automatic feedback on any wrong answers and were able to do the quiz multiple times so that they could learn from doing the quiz. In fact, most of the students did do the quiz multiple times and improved their mark. The students may have repeatedly guessed in order to find the correct answers but this process at least forced them to re-read the scenarios, read feedback on incorrect answers, and identify correct answers.

Once the students had completed the Experimental Design discussion component, they were given a simulated set of data to analyse. A set of seven Flash tutorials were designed to take the students step-by-step through the data analysis (http://cal3.fmc.flinders.edu.au/BTECskills/excel/excelindex.htm). Each tutorial was also designed to stand alone so that it could be used by a range of courses. These tutorials encouraged the students to independently work through the data analysis process and further reinforced and extended their Excel skills. The online tutorials also contained animated audio so the students could listen to the tutorial multiple times and continue to improve their English language skills.

Finally, the module concluded with social activities such as a free pizza lunch and a cultural diversity workshop. This was well received by the students and in contrast to previous years there was a rapid sense of cohort unity and community.

Conclusions

Some key changes were observed. In the course of the semester, there was a dramatic reduction in students asking staff for help with data analysis as their Excel skills had improved. In fact, students displayed increased levels of independence in general. Some of the students went on to use the discussion board for social purposes proving they were able to modify the e-learning environment for social networking purposes.

The e-learning activities proved integral to aiding transition. They encouraged independent learning and provided a means for rapidly standardizing the range of class skill levels in terms of computing and time management skills. They also enabled students new to studying in English to work at their own pace and access material repeatedly.
Of great interest is that students used online scientific lectures to improve their general English skills. This use suggests that providing audio-visual and text-based versions of material online gives students an opportunity to learn multiple skills from one activity. Students displayed greater confidence in their skill levels and in their ability to continue through the rest of the Masters program.

References


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Lisa Schmidt
Lisa Schmidt is part of the Biotechnology programme at Flinders University and is involved in the delivery of topics to undergraduate and Masters students. Part of her role is to arrange orientation activities for new international students and to assist them with their transition to studying in Australia. Her scientific research area is the discovery of novel anti-cancer treatments.

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