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Open Access in Higher Education–Strategies for Engaging Diverse Student Cohorts

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Abstract

With growth in online education, students gain tertiary qualifications through a mode more suited to their demographics such as work and life balance, learning styles and geographical accessibility. Inevitably this has led to a growth in diversity within student cohorts.

The case study described in this paper illustrates strategies based on informed learning design for educating diverse student cohorts in an online program offered by Swinburne University of Technology. The case, an open-access, undergraduate information systems program, attracts mature age students studying while balancing employment and family commitments. The program's open-access facet is the "no entry requirements" such as prerequisite studies. Hence, many students enter the program via non-traditional pathways bringing significant differences in experience and consequent skill bases. The program's innovative pedagogy encourages students to engage via active learning with tailored assessments, interactive communication via discussion boards and facilitated real-time sessions and formative feedback which include audio components.

Keywords: Diversity; e-Learning; higher education; learning design; mature age; open access

Introduction

The case, an information systems program offered by Swinburne University of Technology (SUT) incorporates a systematic and research-led approach to the design and delivery of its units, online and in partnership with Open Universities Australia (OUA) since 2000. OUA is a collaborative venture with several Australian leading universities of which SUT is a shareholder and provider partner. The dynamic between providers sees many online programs being delivered collaboratively, often with different providers contributing to one undergraduate program.

In the information systems program, students gain a technical background in information systems fundamentals such as networking, databases, programming and project management. The expected outcome is that students are able to identify the role and uses of information technology (IT) in order to apply IT solutions to business problems.

Over the past ten years the program's peer recognised advancements in online pedagogy have encapsulated a series of innovative and traditional teaching elements. These have provided an effective and highly successful online educational environment recognised nationally within Australia (ALTC Program Award, 2010).

Particular emphasis is placed on diversity within student cohorts expected because of the open access facet of the program i.e. "no entry requirements" such as prerequisite studies. According to Stone (2013) those studying through OUA are mostly 25 years or older; are working; have parenting responsibilities; and are often first in the family to attempt study at university level. Therefore mature age students are often balancing work and family commitments with their studies and unable to stop or reduce employment to attend a university campus (Signor & Moore, 2011).

The Australian Jobs 2013 publication by the Department of Education, Employment and Workplace Relations (DEEWR, 2013) reports on current and future projections for Australian

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industries and occupations. Interestingly the report highlights the difficulty for graduates to break into the labour market if they do not have work experience however there is no mention of the difficulty faced by many people currently in the workforce who are unable to progress in their career due to a lack of credentialing. Meeting an otherwise unmet need by mature age candidates, the case study supports workers who either desire to credential existing work-based experience or are looking to enhance their career and employability prospects. These aspirations are often anecdotally supported, for example:

> *"As someone with over 20 years experience in the IT industry, I wished to move to an IT management role. However like many of my fellow colleagues in the industry, I had no formal tertiary qualifications"* (Student testimonial, 2010)

Relevant to the requirements of these adult learners is the theory on andragogy which is described by Knowles, Holton III and Swanson (2005) as having several assumptions such as

> adults enter the educational activity with a greater volume and more varied experiences than do children; adults have a readiness to learn those things that they need to know in order to cope effectively with real-life situations; adults are life-centered in their orientation to learning (Knowles *et al*., p. 72).

The case study highlights flexible learning and teaching strategies developed in the information systems program to cater for adult learners with different learning requirements focusing on: engaging students with subject matter; approaches for student engagement with educators and peers; providing assessments with active learning components; and providing students with inclusive formative feedback that supports "feed-forward opportunities for. . . students on their assignments" (Wallace & Moore, 2012, p. 53). This paper elaborates on strategies adopted to support equity and diversity and identifies several gaps in the literature focused on student diversity. Anecdotal evidence of student reactions to some of these strategies is provided however comprehensive evaluation on their effectiveness is not within the scope of this paper.

Strategies for engaging students with subject content

It is not enough to provide learning material online. Of importance is student engagement with subject content (Leong, 2011). Leong observed that "increasing students'" interest in the subject matter may result in higher quality of online learning experience" (p. 24). Student engagement is encouraged in the case through innovative pedagogical design such as learning objects to foster an individualised approach and facilitated with software tools to demonstrate complex theories. The developed bank of learning objects caters for different learning requirements.

Software tools to cater for different learning styles

Static text based content does not suit the learning styles of all students and is likely to struggle in engaging them. Therefore software such as Mimio, Camtasia and Blackboard Collaborate (previously known as Elluminate) has been adopted to provide step-by-step worked solutions to complex problems. Virtual tutorials are developed using Mimio software (an electronic white-board that records voice, images and dynamic text capture). This software allows students to view a pre-recorded white-board presentation of a worked example along with verbal explanations. In contrast Camtasia and Blackboard Collaborate records computer keystrokes, dynamic screen capture and the tutor's voice explaining concepts.

In recognition of the need to support both students with different learning styles and equity for students with learning difficulties, virtual lectures with video components and text-based transcripts are provided. Student preference for either the spoken and/or written word is catered for. Another

reported benefit is that "students are also able to view the lectures at their own pace, revisiting sections as required" (Signor & Moore, 2011, p. 33).

Learning objects for individualised learning

To foster a more individualised approach to enhance student learning, learning objects were adopted into the curriculum. A learning object can be a single file such as an animation, a video clip, a discrete piece of text or URL, or it can be a collection of contextualised files that make up a learning sequence (Oliver, Wirski, Wait & Blanksby, 2005). It is a digital resource that can be identified, tracked, referenced and used for a variety of learning purposes. Learning objects offer a new conceptualisation of the learning process—rather than traditional lectures and tutorials, they provide smaller, self-contained, portable or reusable units of learning presented in manageable segments (Moore & Wallace, 2003).

The transferability of learning objects has proven to be a valuable learning tool for students in the program especially when adjusting for variances in student prerequisite knowledge. For example, learning objects may be reused in advanced units as "refreshers" which is helpful to students who have experienced a lengthy time span since completing prerequisite studies. This portability has also proven valuable when students enter the program with exemptions for prerequisite units. Students may overcome gaps in their knowledge by completing targeted learning objects.

Conversely, learning objects afford students a degree of flexibility to choose which areas within a unit to study as appropriate to their needs since each learning object provides a self-contained piece of information. Therefore, depending on each student's prior knowledge, they can skip any learning object in which they are already proficient, allowing more time to focus on their areas of need. Students are empowered to take responsibility and ownership for their learning within a structured environment. Development of self-directed learning skills is facilitated; students can complete at their own pace.

Venturing into fully-online teaching, it was realised that content within learning objects had been appropriately developed but there was insufficient focus on collaboration with students. Rather, the program was operating in a *distance mode* i.e. unit content packaged and sent to students who were expected to work independently with minimal collaboration. As a consequence of using this mode it was noted there were a number of students in some units who did not submit any assessments and were subsequently being recorded as "no attempts."

Upon viewing that student "no attempts" in 2003 averaged 30% across units (a situation not unique to this program but evident in all the university's online programs), an active attempt was made on improving these statistics in the program's units; culminating in a reduction to the number of "no attempts" in several units within the program to approximately 13% by 2007. Within the case this result has remained consistent in 2013. It is posited therefore, that the inclusive pedagogical approach outlined in this paper played a significant role in improving these statistics.

Interestingly, research by Greenland and Moore (2014) undertaken at the same university found the average of no attempts across broad discipline units to be 20% in 2012. It should be noted that many of these disciplines have not adopted the pedagogical approaches outlined in this paper.

Strategies for student engagement with educators and peers

In accordance with Leong's (2011) reflections on social presence having "a strong influence on student satisfaction in online learning environments" (p. 6), the information systems program includes strategies to enhance communication and collaboration between educators and students and between peers. Student engagement can be encouraged by inspiring and motivating students

through interactive communication and overt enhancement of interpersonal skills. Effective protocols for timely communication and feedback were adopted with students to address the risk of isolation and subsequent disengagement of students. A sense of isolation can be particularly prevalent for students living in rural areas or for students who feel their knowledge is inferior to their peers. However, timely and thoughtful communication from tutors and peers can be very effective in alleviating this isolation. Strategies include establishing student and tutor expectations and clear guidelines including netiquette when communicating online (Moore & Signor, 2014).

The program aims to provide an awareness of the contribution of people as a critical component of information systems (Jackson, 2001; 2004; 2010) and the impact information systems have on organisational culture and the broader community. The diverse experiences of students and educators are drawn upon with interactive collaborative online activities such as online discussion boards and online tutorials in order to develop and extend this awareness. Online discussion boards are a form of communication which is asynchronous (like email) where senders and receivers wait, sometimes days, for responses to queries or discussions. Whereas online tutorials are synchronous in that they offer immediate responses in live, online and facilitated sessions.

Asynchronous Online Discussion Boards

The online discussion boards used in the program are of particular importance for engaging learners through collaborative discussion. Individual categories are provided for students to post discussion threads and student responses are solicited. Tutors respond to posts in a timely manner (within two days). It was noted within the online classes that some students felt isolated. This presented a challenge for students and tutors. As such the collaboration strategies were enhanced by incorporating several fundamental principles of Wright and Schoop's (2003) *Student Centered Discussion model*. For example, the simple action of including the student's name in the thread title when responding (Moore & Signor, 2014). This built a sense of rapport and conversation between the student and the tutor and benefited students by assisting them to find posts relevant to them.

Synchronous Online Tutorials or Chats

To emulate classroom participation where immediate responses are the norm, synchronous online tutorials or chats (virtual classrooms) became a regular feature in the program's units from 2004. Students can come from anywhere in the world and meet each other to discuss concepts as if they are in the same virtual room.

Teamwork and communication skills are facilitated within collaborative settings which enable group discussions that draw from industry experience. The student cohorts in the program are primarily mature age students and as such are recognised for the wealth of experience each student brings with them. As explained by Knowles *et al*. (2005) in the context of adult learning, "prior experience of the learner" is one of the core principles of andragogy (p. 3) and "the richest resources of learning reside in the adult learners themselves" (p. 66). Hence the sharing of experiences as they relate to the subject matter is strongly encouraged. This has resulted in many value-added collaborative online tutorial sessions, where students themselves, stimulate the conversation by bringing in their understandings around the concepts being taught. Students without the benefit of on-the-job experience are engaged into the conversation by their peers with relevant and up to date experiences which assist them in sense making of the content.

Diversity in relation to work and life experience can also present a challenge. Knowles *et al.* (2005) explain that "as we accumulate experience, we tend to develop mental habits, biases, and presuppositions that tend to cause us to close our minds to new ideas, fresh perceptions, and

alternative ways of thinking" (p. 66). Therefore to facilitate student engagement and informed by Wright and Schoop (2003), tailored guidelines for student centered discussions in online tutorials were developed in cohesion with the literature on social constructivist theory (Beck & Kosnick, 2006; Tremblay, 2006). Initially, early online tutorials lacked control and focus with student commitment quite low so student participation strategies were developed for online tutorials covering key points such as: I'm late for the tutorial; who responds first?; when is the right time to ask questions?; can I view the transcript? (Moore & Signor, 2014). These guidelines include the issuing of agendas so students can prepare for each online tutorial.

The improved approach to online tutorials has been well received by students with an observable, positive effect on participation. Students share their learning and experiences with the whole class in an environment that is "safe" and worthwhile. They are able to demonstrate their developing communication skills and critical thinking to their tutors and themselves, for example: a response from the University Student Feedback Survey:

> *"[Online] Tutorials were interactive and very informative."* (Swinburne University of Technology, 2013).

However, where students are unable to attend during the scheduled timeframe it should be noted that equity around accessibility to the online chats/tutorials is a high priority in the program. Recordings are provided of each session so that students who cannot attend the designated online tutorial can read transcripts at a time convenient to them. Students are able to use these transcripts as a reference for problem resolution and for guidance when completing assessments.

Strategies for assessments with active learning components

To cater for different student learning styles, a mix of formative and summative assessments are employed. According to Nicol (2009) assessments have "both a formative role in that it makes learning possible and a summative role in that it certifies achievements" (p. 12). Many of the assessments in the program include: active learning which permits divergent responses; practical projects to develop work-ready skills; theory-based research reports to communicate contemporary and complex issues; online tests and self assessment opportunities to gauge individual learning; and exams with multiple choice questions, mini case studies and project-based calculation questions, to demonstrate and evidence analysis and problem solving skill attainment.

Active Learning in Assessments

Often the mature aged students in the program have a variety of work experiences and background knowledge. Student participation is enhanced by providing options for students to bring in their own work-related scenarios upon which to base their assessments. To cater for students who may not be currently employed, case studies which emulate real-life scenarios are provided to encourage analysis and problem solving. The case study approach is also used in many of the units to help students contextualise the subject content, for example a response from the University Student Feedback Survey:

> *The assessments were appropriate for the content, and they assessed real-life applications of the knowledge given in the unit really well.* (Swinburne University of Technology, 2013).

Students are encouraged to develop a theoretical understanding of the information systems discipline within a real world learning environment. This facilitates successful career outcomes and provides a foundation for lifelong learning. As online educators, it was important to mirror the on-campus practices where a collegial and interactive approach to learning was adopted. Therefore

active learning approaches often include small groups as occur in online tutorials; industry sourced and real world scenarios such as case studies; and relevant assessment tasks designed to give students the opportunity to develop and enhance teamwork and communication skills.

Project-based assessments encapsulate role playing and real world artefacts which encourage student engagement, communication and collaboration. Meyers and Jones' (1993) active learning principles were adopted to encourage student team dynamics and collaborative learning through case studies. The case studies emulate real-world business scenarios which may be used by students to measure their understanding of a particular study area. They overtly guide students to relevant learning objects which may be required to develop techniques and to deepen their knowledge. As many of the students undertake the program to augment their own professional status, assessments are developed by ensuring they are relevant to students' experiences with work or in the community.

As part of the assessment strategy, the assessment tasks in units are often designed as a series of assignments that build on the previous assignment. For example, in a second year unit on business systems design, students undertake in the first assignment a preliminary analysis of a real life case study supported and referenced from mainstream media articles. After completing the preliminary analysis students receive detailed feedback on their progress, what they have done well and where they need to improve. This feeds forward into the second assignment which is based on the student's preliminary analysis of the case study using extant materials (media) and then conceptualising and articulating a design solution.

Building on previous assessments affords students the opportunity of constructing their own knowledge within unfamiliar problem spaces. In developing and delivering this program, a challenge was how to provide timely and detailed formative feedback on students' assessments as explained in the next section.

Strategies for inclusive formative feedback

The challenge of providing inclusive, engaging and formative feedback to students on their assessments is an area of import for many educators in higher education regardless of the mode of delivery—online or face-to-face (Nicol & Macfarlane-Dick, 2006; Voelkel, 2013). Some traditional methods for formative feedback such as written comments can be perceived as very time consuming by the marker and raises the dilemma of quality feedback versus timely feedback (Wallace & Moore, 2012).

Quality of feedback which is prompt and helps the learner improve performance is of crucial importance (Nicol & Macfarlane-Dick, 2006; Schilling, 2013). Protocols have been established in the information systems program for the return of feedback on assessments within ten working days, enabling students to act upon this feedback to enhance their learning. In relation to quality feedback, part of the solution is the provision of audio feedback which can offer detailed feedback that is quicker to produce than if the same level of detail is typed as comments (Wallace & Moore, 2012).

Audio Feedback

The audio feedback provided to students contain constructive critiques of their submissions that transfers on to the next assessment i.e. feedback is not just for the past work but relevant to future use in later assignments and units. The purpose of assessment is to enhance and encourage current and future learning. This method of feedback has enabled the provision of personalised comprehensive analysis of students' submitted work.

The audio recording of student feedback is done by the tutor with the use of a digital recorder in a quiet place such as at home or office. A sound booth is not necessary. These MP3 files are uploaded directly onto the Learning Management System (LMS), in this case Blackboard. Students then download and listen to the tutor's comments while viewing their submission. This method for providing feedback is quicker than detailed written comments. As noted by Wallace and Moore (2012) "a 10 to 15 minute audio recording providing feedback on a student assignment would take one of the authors at least three to four hours to type in order to provide the same information" (p. 55). If this task was multiplied by 100 or more students "the time saving attributes of audio recording become clear" (p. 55).

The study by Wallace and Moore (2012) utilised student surveys on the use of audio feedback for assessments and revealed that 74% of students generally agreed that audio feedback provides a richer and more informative type of feedback compared to the more traditional forms such as written comments. An important element is the "personalisation factor" (p. 56) felt by students in hearing the tutor's voice with 30% of the students' surveyed indicating this helped them feel "more a part of an inclusive learning environment" (p. 56). Of particular interest is that 80% of students felt that audio feedback enhanced their learning experience indicating "that the audio recording provided better quality feedback that was not as brief as written comments they had experienced in the past" (p. 56).

Audio feedback can assist in addressing isolation between the online student and the educator. The added benefit is that audio feedback creates a sense of rapport between student and educator as well as a personal element often missing in online education (Wallace & Moore, 2012).

Conclusion

The strategies adopted in the information systems program, the case, not only cater for diverse student cohorts in the information systems program but more importantly leverages from their diversity. Students enter the program with a variety of work and life experience and subsequent skill bases and learning styles. Andragogical theory as explained by Knowles *et al*. (2005) highlights that adult learners bring with them rich sources of learning in the form of their own experiences, but they also brings challenges such as pre-conceived views that may hinder a willingness to embrace new ideas and perceptions. Therefore to encourage student engagement the following key areas, strategies and techniques may be used to facilitate and embrace student diversity:

- Student engagement with subject content: encouraged through a variety of software tools such as Mimio, Camtasia and Blackboard Collaborate and through the use of learning objects that allow students to more easily identify the gaps in their knowledge hence focus their time and study in the areas needed.
- Student engagement with educators and peers: developed through collaborative techniques adopted in discussion boards and online tutorials/chats.
- Providing assessments with active learning components: through theory and work-related assignments that encourage divergent responses and permit students to associate to their work situation or visualise from real-world scenarios.
- Providing inclusive formative feedback on assessment submissions: students receive constructive and timely audio feedback which enables them to feed these forward to subsequent assessments.

These strategies coupled with the contemporary literature demonstrate the capacity for online education to do more than just cater for students from diverse backgrounds. This diversity can

enrich online programs when mature age students are encouraged to utilise and share their knowledge and experiences with peers and educators. The online environment, through collaborative techniques has the potential to foster engagement and active learning beyond subject matter that can be rich and rewarding not only for the students but for the educators as well.

The case study provides brief insight into the potential for sound pedagogical principles, working with student diversity for the engagement of open access students. A limitation and subsequent area for further research is to evaluate, through qualitative methods, the effectiveness of the strategies described in this paper in terms of student satisfaction and perceived learning growth. Research will also be conducted to investigate the causal effect on student "no attempts" within open access education.

Another identified area for further research in a more general light is the understanding of how higher education may or may not be meeting the needs of mature age candidates for career advancement. This paper identified a potential gap in the literature and government focus in this area.

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