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Preparing distance education Built Environment students for an academic program

Josua Pienaar; Darryl O'Brien; and Antony Dekkers.
CQUniversity Australia
Corresponding Author Email: j.pienaar@cqu.edu.au.

BACKGROUND

CQUniversity offers five Built Environment programs across three disciplines in Construction Management, Building Surveying and Building Design. The programs require between four and seven years of study. The programs are offered in distance education, command a high level of commitment and are considered extremely challenging. Attrition rates are high and are amplified by students entering the programs to achieve goals such as gaining a promotion rather than an interest in the program itself. Therefore, there is a definite need to engage and prepare commencing first year students to ensure they have the motivation and skills necessary to continue.

PURPOSE

To determine 1) if introducing a program specific on-line course equips students with the necessary skills to successfully complete an academic program in the Built Environment exclusively through distance study, and 2) whether the introduction of a scaffolded learning environment creates an online presence that improves student retention and overall student academic outcomes.

DESIGN/METHOD

Term 1 students were surveyed in week 6 and at completion. The survey gathered information of students' prior knowledge and skills with relation to academic achievement and skill, industry knowledge and communication ability. As all students were studying by distance, they were also questioned on the usefulness of additional study resources, virtual classrooms and support supplied with the course previously not part of the Built Environment programs. As engagement was considered critical to students not feeling isolated, students were also questioned with regards to promptness of feedback.

RESULTS

The study found a reduction in students' apprehension when studying in distance mode, specifically with regards to resources. Students felt more confident in tackling other courses within their programs and feedback was considered beneficial to their studies, especially as the majority was provided within one week. The study further found that online virtual classrooms stimulate student interaction with other students as well as with staff. The shortcomings in the provision of information in a rudimentary course profile with relation to assessment requirements were highlighted. It was found that students focus on assessment requirements rather than assimilating course resource material. Additionally, the use of online forums do not adequately convey important course related information to full-time employed students in a distance program at a regional university.

CONCLUSIONS

It was concluded that a foundation course with supported frameworks, containing formative assessment, regular and prompt feedback and continuous availability of academic support, encourages commencing students' engagement in resource material and course content. Although similar studies conducted in engineering, mathematics and the social sciences have delivered similar results, they were not exclusively instigated to arrest attrition in a distance education program. Course scaffolding and support also increased student confidence which in turn benefited academic progression in their program.

KEYWORDS
Progression, Attrition, First year, Built environment, Scaffolding.

Introduction

Globally universities are changing the focus of their undergraduate degrees, broadening participation and increasing enrolments. These changes are not without consequences. In response to competitive pressures such as the Lomax-Smith, Watson & Webster (2011) funding review, Universities are recruiting more students, with fees generated being perceived as more important than academic ability. Consequently, some students are not prepared for academic study, leading to higher attrition. With the Federal Government's aim to target at least 40% of 25 to 34 year olds attaining a qualification at bachelor level by 2020 (Gillard 2010), student engagement and retention are important motivators for academic institutions.

In addition to the normal enrolment pathways associated with academic programs, there is a shift towards increasing numbers by alternative means. Universities are investigating dual sector opportunities, guaranteed vocational to higher education pathways and recognition for prior learning and current competence. As alternatives for supporting student numbers these avenues of supply are results driven but can leave the learner behind.

CQUniversity has five distance education Built Environment programs across three disciplines covering Construction Management, Building Surveying and Building Design. The programs require between four and seven years study for completion. Historically, student attrition rates have been confounded by students who take advantage of the programs to achieve career goals (e.g. securing appointment to a more senior position) rather than program completion and degree award. Nonetheless, there was and remains a need to prepare first year first term students to ensure they have the skills necessary to achieve the goals they seek by undertaking a challenging academic program. At CQUniversity, a regional university, the question faced is "*How do we adequately prepare these distance education Built Environment students and enable them to successfully develop their skills to manage and enjoy their undergraduate study?*"

To assist the transition of this mixed demographic into Built Environment programs, foundation course for commencing students was introduced. The course included supported frameworks which contained formative assessment, regular and prompt feedback and continuous availability of academic support mechanisms.

The course introduced participants to university systems and procedures and provided distance education students with a virtual space where they could interact and connect with others while not doing any wrong or breaking any infrastructure – a collaborative playpen . The course provided not only for academic stimulation but also provided students with a time allocation where discussions outside the confines of the academic program were welcome. As a diverse group ranging from young school leavers, well educated professionals to retirees aiming to formalise their careers, conversations quickly developed along the most common discussion lines of "work-life-balance" and how to maintain a positive and disciplined outlook on the academic program ahead.

The aim was to stimulate student engagement in resource material and course content to prepare students for their study, regardless of their former skills and educational achievements).

Several papers have been published on the classification of student cohorts (Andres et al. 1997; Cartney & Rouse 2006; Dill & Henley 1998; Holley & Dobson 2008; King 2010; Lui 2008; QSA 2008; Tickell & Smyrnios 2004). It can be argued that within any cohort, demographic classifications will exist i.e. age, gender, ethnicity and language. Moreover, a number of studies have classified students as traditional and non-traditional students.

A 1998 study identifies diverse groups of students as "traditional students" and "non-traditional students (Dill & Henley 1998; Ely 1997). The study found that "non-traditional" students can be defined as having multiple roles including "parent", "employee", "student", "business owner" and with at least one year between high school and university.

Furthermore it found that “traditional” students typically do not have multiple roles and enter university or tertiary education directly from school. In addition, traditional students are classified as post-year 12 fulltime students continuously enrolled between the ages of 18 to 24 while non-traditional students make up everyone else (Andres et al. 1997).

Non-traditional students had less academic related stress, performed better under academic pressure and exhibited better health, while traditional students had more time available for academic activities but achieved less academic satisfaction (Dill & Henley 1998). While identifying and analysing the reasons for withdrawal from Higher Education (HE) and Vocational Education and Training (VET), Meeuwisse (2010) further classified “switchers”, “non-completers” and “dropouts” to group the reasons for student attrition.

Various reasons are offered as “drop reasons” or attrition including institutional facilities, quality of the organisation, external commitments, interest and motivation and sociol-economic status. Personal reasons include home situation, future job prospects, quality and content of education, ability and culture. Within the dual stream classification of Dill and Henley, Meeuwisse and colleagues (2010) further defined switchers, non-completers and dropouts. Earlier research (1997) supports the classifications by Dill and Henley, Meeuwisse and colleagues.

Additionally, it informs that the mature age student of 25 years old or older must balance study, employment and financial commitments, effectively embracing risk in order to gain a higher education qualification. The work life balance challenge facing Built Environment students is supported by a recent Australian study (Sher et al. 2010). These students generally perform better than their younger counterparts but take longer to complete their studies.

Can the introduction of a program specific on-line course equip students, especially non-traditional, with the necessary skills to successfully complete an academic program in the Built Environment exclusively through distance study? Furthermore, can the introduction of a scaffolded learning environment create an online presence that improves student retention and overall student academic outcomes?

Theoretical Framework - Scaffolding and Adult Learning

Scaffolding was initially conceptualised from a socio-cultural perspective as “a form of assistance that enables the child or the novice to solve a problem, carry out a task, or achieve a goal that would be beyond his or her unassisted efforts” (Wood, Bruner & Ross, 1976, p. 90). However, this approach to learning is true for all (Wood, Wood & Vygotsky, 1996).

The original notion of scaffolding has been extended and challenged as information and communication technology (ICT) based learning support has emerged (Azevedo & Hadwin 2005; Lajoie 2005). Within contemporary higher education, learning can be situated on a continuum from face-to-face, through to a blended approach to completely ICT-based. In course delivery utilising ICT, the human interaction varies from reduced interaction to no interaction and teachers tend to be less responsive to learner feedback. Wood et al. (1996) suggest that if interaction with computers can mirror even a small part of the effectiveness of class instruction, then progress towards more effective teaching is being made.

A number of guiding principles have informed the design and development of study materials for scaffolding students using the first year first term foundation course for commencing students. These principles are essentially based on the adult learning literature by Knowles, Holton and Swanson (1998) and Entwistle and Ramsden (1983) and the principles in the use of computer-based materials (Alessi & Trollip, 1991). These aspects are briefly considered:

- Adult learners enrolled in the foundation course are considered experiential learners who need programs that are meaningful and relevant to them. Adult learners like to be involved in the learning process facilitated in a climate of respect. Each student did an online skills audit survey to determine their background knowledge and

understanding of the skills required in the Building program (information literacy, written communication, general construction knowledge and mathematics).

- Adult learners see education as a process of developing increased competence to achieve their full potential in life. They want to be able to apply whatever knowledge and skills they gain today to living and working more effectively tomorrow. Accordingly, learning experiences should be organised around competency-development categories.
- It is a normal aspect of maturation for a person to move from dependence towards increasing self-direction. The rate of change to self-directed learning varies between people, depending on their backgrounds. Thus it is important to provide independent learning materials appropriate to a range of individual needs and levels of ability. Materials should, as far as possible, be self-instructional and self-paced and contain self-assessment opportunities.
- As individuals grow and develop, they accumulate a reservoir of experience that becomes an increasingly rich resource for learning. Accordingly, study materials should be activity-based and promote experiential learning within a supportive learning context.
- Individuals become ready to learn something when they experience a need to know in order to satisfy real-life tasks or problems. Thus materials should be relevant to the adult learner's own needs and encourage the learner to discover the need to know.

Student progression through the acknowledged hierarchy of learning was an important consideration in the design of the course. As an introductory course, it was determined that a behaviourist model would provide the appropriate framework for positive learning outcomes.

COURSE DESIGN

Various aspects of an academic program development were identified as being deficient in the past and current student cohort. Some of the areas identified included University systems and services, knowledge and control of learning management and collaborative technologies employed by CQUniversity, mathematics, referencing and plagiarism, exam etiquette and skill, basic research and information search, online journals and use of course resources online with presentation skills bringing up the rear.

Developing from a twelve week term baseline, the course had to cater for all walks of student life ranging from fulltime employed, school levers, mothers with or without children, dads in the same situation, professionals and retirees not familiar with computers or any aspect of information technology.

As a final product, the course components were carefully selected to represent the most important characteristics identified as deficient. While five of these aspects were delivered "in-discipline", it was decided to outsource the remainder to facilitate a wide spectrum approach of exposure to first time participants. Outsourcing meant that participants could experience alternative approaches to teaching, collaboration while self-learning current era personal interactive collaborative skills.

Each of the course components included an assessment or multiple assessments allowing participants to experience firsthand in a "non-destructive" way (speaking from an academic record point of view) how to plan for production in a distance education program.

DESIGN/METHOD

The study followed a basic mixed method design. This methodology was selected to address the need for an understanding of factors influencing student articulation and progression in a first year first term foundation course in a distance education Built Environment program (Cameron 2010; Creswell & Tashakkori 2007; Ivankova, Creswell & Stick 2006). The purpose of the project was not to provide conclusive evidence and determine the long term success of the introduction of the new course but rather to set a

baseline for future longitudinal retention and progression studies in a distance education environment focussing on a specific industry (Golding Lloyd & Griffiths 2008; Ioannou & Artino 2009; Tinto 1997) while providing an insight to gaps in understanding attrition in this context.

PARTICIPANTS

The course was introduced as a first year compulsory course in the first term in 2012. The course design does not allow credit transfers. All students enrolling in the Built Environment programs (and previously enrolled who have not completed the course predecessor) have to complete the course. The course is a prerequisite to 8 downstream courses. Total initial enrolments for the course at census date were 135. In total 56 students participated representing a response rate of 41%. The average response at CQUniversity is about 25%.

The first part of the study and survey focussed on the gathering of quantitative data with the second survey focussing on a qualitative approach. The results from the second phase informed results obtained from the quantitative data.

DATA COLLECTION AND CODING

Term 1 students were surveyed in week 6 and at completion of the course. The two stage survey was distributed to all enrolled participants using the learning management system Moodle. Some of the baseline questions from the first survey were repeated to establish if a change response had occurred. Questions used a five point Likert scale and multiple free text areas and were coded anonymously to protect students' privacy. Using the same coding mechanism for both of the surveys it was possible to link the pre and post-test survey to determine student's interaction with the course materials.

The survey gathered information pertaining to students' prior academic achievement and skill, industry knowledge and communication ability. As all students were studying in distance education mode, they were also questioned on the usefulness of additional study resources, virtual classrooms and support supplied with the course previously not part of the built environment programs. It was vitally important that they engaged with the material and did not feel isolated; therefore students were also questioned with regards to promptness of feedback.

Survey questions covered basic demographical areas, previous education experience and background and qualifications, employment, information technology skills and use and exposure to online social media and distance education delivery methodologies and pitfalls experienced. The first survey created a baseline while the second survey informed development of skill, engagement and interaction with other students, resource material and course facilitators.

Several areas of importance were isolated addressing student retention and progression in a foundation course. The areas were a) demographics and personal academic load impacting circumstances, b) previous educational exposure and academic pathways, c) academic program readiness and d) notional time expenditure online.

RESULTS

Particularly interesting from the results was the confirmation that a major source of student enrolments for the distance programs originates from previous vocational education and training sources. 47% of respondents indicated previous study at a TAFE or related institute.

The results represent an unexplained phenomenon which warrants further research. A possible but unconfirmed argument for the shift in nominal hours dedicated to course activity might be attributable to the increase in course intensity after the mid-term break, additional

assessment items becoming due and the requirement that students perform presentations online utilising online collaborative technology.

Table 1: Hours spent online (shown in %)

	Hours	Week 6 (%)	Week 13 (%)
Educational online activities (course related)	1 to 5	29	24
	6 to 10	26	29
	>10	45	47
Hours online (other)	Less than 1	9	12
	1 to 5	38	29
	6 to 10	18	24
	>10	35	35

The results informed by empirical observations and course specific student feedback include:

a) Following completion of the foundation course, student's reported fear of distance education study generally and confidence in engaging other courses in their programs specifically was reduced; Students reported that timely feedback (i.e. received within 7 days) assisted their learning by providing feedback and encouragement, which was supported by course evaluation feedback.

b) On-line virtual classrooms stimulate student interaction with other students and with staff by creating an online social and teaching presence. Again this finding is supported by course evaluation feedback, where a number of comments supported the importance teaching and social presence in an online learning environment;
However, an evaluation of the student comments indicated that not all student experiences were positive. For example, the required level of online interaction lead to criticism that the course structure failed to recognise other competing workloads:
This comment is a significant concern, as creating an inclusive learning environment was a key performance outcome of the course. It is noted however that no lecturers reported moderating negative forum posts, however with total course forum posts of 26750 (average post per student 202) monitoring every forum thread was not possible,

c) Students engaged in online distance education tend to focus firstly on assessment requirements while not assimilating course resource material, highlighting the need for structured release of course information/assessments when dealing with behaviourist level learners. Whether this attitude reflects a student's prior experience with the delivery of distance education resources (where study resources were posted out as a complete package) or simply an expectation that all materials should be available from the start of the term is not known. However, as it is not possible to include all course learning outcomes in the prescribed assessment items it remains our view that staged release of learning materials and assessment items is a legitimate and effective method of ensuring that students are exposed to the complete course content.

d) Whilst assessment feedback is a recognised tool to encourage self-reflected learning, it would appear that the design of the course did not adequately communicate the available range of communication options available to students. In order to overcome this perceived deficiency in future course offerings it is proposed that the course design will be amended to ensure that the range of available communication options are prominently displayed on the course home page. The second criticism related to the design of the forum site;

Given the volume of forum traffic (a total of 26750 posts, with an average of 202 posts per student) this comment appears to have validity. In future offerings it is proposed to have a range of descriptive forum menus (for example; 'news forum', 'assessment item 1 information forum') to reduce the extraneous load encountered by students when seeking information through this medium.

e) Results for the course included 35% high distinctions, 25% distinctions, 8% credits and 5% passes.

The study found and reported a reduction in students' apprehension when studying in distance mode, specifically with regards to resources. Students also felt more confident in tackling other courses within their programs. Findings from the survey found that the feedback was beneficial to the students' studies as the majority of feedback was returned within one week. The study further found that online virtual classrooms stimulate student interaction with other students as well as with staff. Also shortcomings in the provisioning of information in a rudimentary course profile, with relation to assessment requirements, were highlighted. The study found that students tend to focus firstly on assessment requirements while not assimilating course resource material and that the use of online forums do not adequately convey important course related information to full-time employed students in a distance education program at a regional university.

Observations

In order to simulate a classroom environment, increase engagement and overcome the isolation of external study, the Tablet PC was used to create instructional videos for the course content, which were provided via the Learning Management System (LMS). These videos stepped students through each of the questions on the sample test showing not only the solution but also the thought process involved, as if the student were in a class with the lecturer. The videos could be easily paused, rewound and replayed until the student understood how to solve the problem. Therefore, the videos provided students with the opportunity to mentally plan a sequence of strategic decisions when forming a strategy for solving equations, which is vital for learning (Robson, Abell & Boustead, 2009).

Students thought the videos were beneficial to their studies. The majority of students liked the step-by-step solutions and the ability to see the correct setting out. They also appreciated that they could both hear and see the solution unfold. Students noted that the quality of the sound recording could distract from the content, thus highlighting the need for quiet recording spaces and good quality microphones. Despite the majority of students conveying a favourable view toward the use of the Tablet PC, a few students did not feel that it enhanced their learning experience and commented that they were 'used to the whiteboard'.

In terms of academic success of the course, the immediate results are available with the vast majority of the participants reporting a positive outcome and academic achievement. The purpose of the course was to prepare students for further studies in their chosen program. The true success of this course lies in increased retention in subsequent courses due to the skills and confidence gained within this course.

The structure and layout of this course also assists students in their further studies as subsequent courses are designed following the same look and feel. It can be argued that only after the completion of future courses would it be possible to gauge the impact of this course as it will influence the fluidity and ease of progression for students in a full distance education program.

CONCLUSION

It is concluded that a foundation course for commencing students, with supported frameworks containing formative assessment, regular and prompt feedback and continuous

availability of academic support mechanisms, stimulates student engagement in resource material and course content. Similar studies conducted in engineering, mathematics and the social sciences have delivered similar results however were not exclusively instigated to arrest attrition in a distance education program. Course scaffolding and support also increase student confidence which in turn benefits academic progression in their program.

With the increase in tertiary focus on higher education outcomes, student access has become of paramount importance in distance education. The quality of online programs designed to specifically encourage student engagement previously only encountered in face-to-face environments are now in the crosshairs of speciality focussed universities and educational stakeholders. Student progression is an important aspect of creating a sustainable educational foundation for both student and university (Berge & Huang 2004) and ensuring student participation and overcoming isolation (Croft, Dalton & Grant 2010) student attrition in built environment programs can be overcome.
Indications at this early stage are that this course has equipped students with academic skills and confidence needed in future courses.

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