CRITICAL CHALLENGES FOR MANAGING ASSESSMENT OF STUDENT LEARNING IN ONLINE PROGRAMMES

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Abstract

Managing any educational programme has its challenges, and this is no different for online delivery. Literature and research provide considerable insight into challenges associated with the pedagogy of adult learning; the design and maintenance of quality online programmes; learning management systems and technology solutions; and assessment – all issues which are critical for the students' success and the institution's reputation. This paper describes the New Zealand higher education scene and the online programmes offered by one regional provider. It looks at the critical challenges management have faced in developing and maintaining these programmes and in particular, assessing student learning. We outline the risks and benefits of some alternatives to the current method of summative assessment, and conclude by offering recommendations for further investigation into the utilisation of technology in the delivery of quality summative assessment for distance learners and a call for a community of practice to discuss our progress.

Key words: *online, education management, assessment*

1. BACKGROUND

In New Zealand, higher education has many faces. Our eight universities, the youngest of which was established as recently as 2000, account for 33 percent of our post-secondary students. The remaining two thirds are dispersed between 18 institutes of technology and polytechnics (ITPs), two colleges of education, three wānanga (a publicly owned tertiary institution that provides education in a Māori cultural context) and an ever-changing array of private training establishments (PTEs), with 604 registered at the time of writing. Clearly there will be a correspondingly wide range of subject, level and quality within the courses on offer.

Within this array, the Bay of Plenty Polytechnic (BoPP) is a small – medium sized regional organisation in New Zealand's Institutes of Technology and Polytechnics (ITP) sector, delivering certificate, diploma and undergraduate degree programmes with strong pathways established for our students to feed into partner universities for post-graduate study. A core aspect of our business is vocational and professional training; in today's competitive market, we have to be highly responsive to the changing needs of all our stakeholders, and maintain a very close scrutiny over the quality of what we offer and the value ascribed to our qualifications. BoPP offers programmes which are designed to ensure that students progress towards, and ultimately achieve an employment-enabling qualification which has strong local support, and external quality approval, with credit recognition by other providers.

The "School of Business" faculty has a vision to provide education courses for the local, national, and the international market. Within New Zealand the market for local qualifications is shared by numerous tertiary providers and unless there is adequate local need for the particular qualification then the sustainability of the programme is questionable. There is a steady local demand for qualifications in areas such as business administration and management, whereas more specialised programmes with limited local appeal but distinctive to New Zealand (e.g. those based on New Zealand law) meet a national need, although we normally look for an exclusive market share to make these programmes sustainable. While exclusivity is ideal for our institution we cannot expect that all potential students will travel to our city to study here, and this has been one of the driving force behind an online delivery option. Programmes such as the Graduate Certificate in New Zealand Immigration Advice (GCNZIA) have an international market, and our status as exclusive provider of this successful qualification is completely reliant on the online platform we have developed.

2. CRITICAL CHALLENGES ADDRESSED IN THE LITERATURE

2.1 Developing and maintaining quality online programmes

Govindasamy (2002) cautions organisations embarking on implementing e-learning to consider the pedagogical principles that govern good practice. He discusses a study (Quality on the Line, 2000) which draws on the experiences of six "e-Learning pioneer" (p. 290) institutions in the United States, observing that the parameters for successful online programmes which are recounted here, are now widely adopted as desirable characteristics for all online environments. These seven attributes are: Institutional support; Course development; Teaching and learning; Course structure; Student support; Faculty support; and Evaluation and assessment.

Similarly, California State University (2012) (CSU) identify six areas as critical challenges which must be met by education management when planning and implementing effective online learning experiences and qualifications:

- A "reliable learning platform" which allows for well-organised and easy to navigate courses (p. 2)
- Enrolment processes and resources providing extensive information about enrolment and being an online learner, engagement and support strategies which link the learner to campus resources
- Good programme design which provides opportunities for interaction and communication between students and the instructor; clearly defined course goals aligned to learning objectives and "delivery using multiple visual textual kinaesthetic and auditory activities and opportunities to develop critical thinking and problem solving skills" (p. 3)
- Exemplary assessment and evaluation practices which set students up for success by developing the length and difficulty of the assessment throughout the course and providing timely tutor feedback as well as opportunities for self-assessment and peer feedback
- Innovative teaching with technology
- Faculty use of student feedback

Clearly there is considerable overlap between these lists; of interest to this paper is the focus on evaluation and assessment in eLearning, which has become a specialty area in its own right.

2.2 Assessing student learning in online programmes

According to Davidson & McKenzie (2009) there are two distinct purposes of assessment: assessment 'for learning' focused on using assessments to help students improve and move forward in their learning, also known as formative assessments, and 'of learning' or summative assessments, covering what and how much the students have learned, tied to specific learning outcomes which are themselves derived from the graduate profile.

This is where software can make a significant contribution; Learning Management Systems (LMS) offer many tools to facilitate assessment for learning which, if well designed, can provide both immediate feedback and graduated learning experiences. Govindasamy (2002) cautions that "most LMS providers perceive themselves as mere providers of technology" but it is a "serious challenge" to utilise all the features as leaving them unused "is a terrible waste of resources" (pp 288-289). He encourages organisations embarking on implementing e-learning to consider the pedagogical principles that govern good practice, and not to succumb to the convenience of using automatically scored questions types for [all] assessment.

Although there are many methods of assessing and evaluating students' work, examinations seem to be the most common method of summative assessment of student learning. The idea of examinations appears to have originated as a means to assess applicants for jobs in the civil service. Bodde's (2004) article in *Asia for Educators* traces the advent of educational assessment, describing how China was the first country to install the merit system as a method of selection of applicants for government

office from as early as 165 BC. Later, evidence of the origins of the British civil service appear in the British East India Company's approach to recruitment. In 1806 they established a small college near London whose purpose was to train Company employees for administrative service in India. By 1941 the United States government had adopted the same idea, with nearly 2,500,000 men and women taking examinations for public service positions. Thus, says Bodde, the principle was established of stipulating that only men (this was the first half of the twentieth century!) who possessed certain preparatory qualifications were eligible for employment in public administration.

In education today we have many colleges/universities/higher education institutions which deliver courses and qualifications in preparation for various types of employment. For these qualifications to be valued as a successful indicator of capability, the prospective employer needs to know that the required knowledge and skills have been learned. Assessment of learning provides that assurance. If this is the practical explanation, there is also a pedagogic one: an article in online newsletter Edutopia (2008) asks why assessment is important, and answers: "Asking students to demonstrate their understanding of the subject matter is critical to the learning process; it is essential to evaluate whether the educational goals and standards of the lessons are being met" (para. 1). The owners of this site clearly believe assessment is an integral part of instruction.

The management of critical elements of assessment such as exam validity and security, and candidate identification, were considered even in the earliest evidence of examinations in China. Candidates arrived with a few personal amenities (exams were over three days) and an inkstone, ink and brushes. Guards verified a student's identity and searched for hidden printed matter. Candidates were allowed no communication during the exam period. In order to obtain objectivity in evaluation candidates were identified by a number rather than name, and examination answers were recopied by a third person before being evaluated to prevent the candidate's handwriting from being recognized. Twenty-two centuries later, most of us will find this all quite familiar.

Indeed, similar actions to prevent students cheating are taken today where students attend an exam venue at a specified time; identity is checked; an identity number (not name) is written on the exam answer book; only writing equipment is allowed to be brought into the room; and an invigilator or proctor supervises the exam for the set time and collects the exam papers at the end of that time. Yet still the issue of cheating in exams persists. Predominately these exams are paper based even though the course itself may have been taught totally online. Some online courses use computers for the exam but issues around security and cheating still prevail.

Krask (2007) describes the commonly held belief that academic dishonesty is easier and more prevalent in online courses and the research which attempts to dispel this notion. She notes that even with the limited number of research studies available "it must be concluded that instructors need to be vigilant and adopt methods to discourage cheating online" (p.160). Krask found that most sources she reviewed recommend that critical examinations be proctored, and yet, she says, it "seems to defeat the purpose of an online course if students are required to take examinations at the college offering the online course" (p.160). However educationalists are constantly trialling new strategies and solutions, and in fact there are several ways to provide alternative proctoring.

3. ALTERNATIVE ASSESSMENT MANAGEMENT

The critical considerations for any summative assessment is the quality of the exam itself, the security of the exam, correct identification of the student taking the exam, and elimination or minimisation of the opportunity to cheat. Alternatives to the traditional approach of a paper based exam at a venue selected by the education provider, must also be economic for the institution and accessible by the student. Providing an electronic exam seems to make sense in this day and age of technology, particularly when all the course work up to the point of the final exam has been completed on a computer in the student's own home or office. However the critical considerations still need to be addressed.

3.1 Security of the exam

Different systems to secure the student's own computer have been available for several years. Krask (2007) identifies *Securexam Browser* as a useful tool which locks down a student's computer so that nothing else on the computer is accessed during an exam save the use of Microsoft Word and Excel, and then encrypts a student's test as it is submitted to the instructor. Other tools such as *Respondus LockDown Browser*, work in a similar fashion. Kryterion Global Testing Solutions (2014) is a company which specialises in "affordable and secure testing options" for higher education, offering "online proctoring services that are secure effective, convenient and affordable…. Students like the service because they can complete their tests from the comfort of their homes… many universities opt to use online proctoring because it's secure" (p. 1). Commercial tools such as these will clearly come at a cost, and would need to be carefully investigated before being used for programmes such as those offered in my own area (described in Section 4 of this paper).

3.2 Identification of students

There are also various electronic and software products which can be used to identify the person taking the exam, for example, by using webcams, fingerprint readers, or facial recognition software.

Sarrayrih & Ilyas (2013) look at ways to improve identification security, which is one of the key challenges of online exams. They propose a system to improve security of online examination by utilising technologies such as biometric authentication, internet firewalls, cryptography, network protocols and object oriented paradigms and conclude that the incorporation of biometric face recognition can achieve this. The examples they list show how – in theory - innovative applications of new research and development in technology can assist providers, yet once again, the financial investment required may cause concern for many smaller institutes. Such concerns may, or may not be justified, as there are also very real costs with human resource-dependent approaches: as will be discussed shortly, the decision each organisation makes here will be context and circumstance-specific, and there are, unfortunately, no one-size-fits-all solutions.

3.3 Minimising cheating opportunities

Identifying the student and securing the exam do minimise risks but there are still opportunities for a student, unsupervised in their own home or office, to cheat - perhaps by having another person in the room out of webcam view and on another computer with access to the internet - or other parties on call who can help with answers. Krask (2007) found that despite all the alternative hi-tech solutions, the presence of a supervisor /proctor was still desirable.

Cluskey et al. (2011) state that typically an exam proctor is either a person or a machine, and offer two examples of the latter: *Remote Proctor* and *ProctorU*. *Remote Proctor* is supposed to verify the student's ID (thumbprint) and eliminate cheating through the use of a motion detector. Suspicious motion by a student taking an online exam causes a video to record the student's actions. Instructors then review these exam videos for evidence of student cheating. *ProctorU* takes a similar approach in that one electronic proctor in a control room monitors six to eight students taking exams. The teaching faculty do not need to review the video unless the proctor tool records and flags something questionable regarding student honesty.

The authors do note the costs of supervised online exams to the institution, which may then pass these on to their students, and therefore propose a less costly non-proctored alternative to promote academic honesty using eight control procedures that enable faculty to increase the difficulty and thus reduce the likelihood of cheating by students. Cluskey et al. (2011) describe the eight control processes as: (1) the exam is offered at one set time only, (2) the exam is open or computer accessible for only a short period of time, (3) the sequence of exam questions be randomised, (4) exam questions are presented one at a time and students cannot move forward until the question is completed, (5) design the exam so that good students have only enough time to complete and poorer students may not finish, (6) allow

the student to access the exam only once, (7) use a computer 'lockdown' feature which means students are unable to exit/return, cut/paste, or electronically manipulate the system, and (8) change at least one-third of multiple choice/objective questions on each exam each time it is offered.

From these studies it can be seen that there are various alternative methods for conducting the final summative examination. The exam can be paper based and conducted from a selected venue; it can be computer based and again conducted from a selected venue with a supervisor in attendance; computer based at a venue with an electronic proctor; or computer based and undertaken on the student's own computer with remote control of the computer (to limit access to anything but the exam) and with facial or thumbprint security for identification. However none of these alternatives will completely guarantee the identity of the person taking the exam or guarantee cheating will not occur. Organisations considering their options for the delivery of examinations at the end of an online course will need to weigh up the options, risk mitigation, and costs, in determining the best solution for their situation.

4. OUR CURRENT SITUATION

The Bay of Plenty Polytechnic's Business School has a growing Legal Studies department which has four main programmes; two are delivered solely online and two have an online option as well as a classroom option for those living in the local area. The growth of online programmes has created some challenges for our institution. We have developed positions for e-learning design specialists, and developed teaching skills and strategies for online teaching, challenged student support systems and also our flexible work policy. The remainder of this paper offers a brief description of our conceptual approach before outlining these four online Legal Studies programmes, followed by an overview of our assessment management strategies, and how our institute has tackled the critical challenges for management of assessment.

4.1 A philosophy for quality online programmes at BoPP, and the delivery model

The two-fold motivation for developing these online programmes comes from the need to reach students outside our local (driveable) area, and to satisfy our external stakeholders, both government licensing bodies and future employers, that our graduates are well prepared for their professional career. The quality of these programmes has been assessed by the author Steele (2014) against the six different domains in California State University's rubric for online instructional design. In evaluating our programmes against these domains it was concluded that in all domains our programmes were well above the rubric's standard of 'effective' and meeting or close to the standard of 'exemplary'. The introductory course for each of our programmes provides information and links to all support services as well as demonstrating the navigation and features of the LMS 'Moodle". Our programmes are well-organised and easy to navigate, and through their interactive design provide opportunities for students to interact with each other and their instructor. The course design facilitates formative assessment using Moodle features with in most cases immediate feedback, as well as higher level assignments testing critical thinking and evaluation skills. Along with all the innovative features of the LMS Moodle our programmes utilise adobe connect for web conferencing weekly tutorials, and other multimedia resources including video and audio for enhanced learning for the students. Learning diagnostics within Moodle enable the instructors to track participation and completion of activities and recognise where a particular student is having difficulty. The programme and teaching evaluations provide feedback to the teaching staff and management. This feedback where relevant is used to improve any aspects of the programme content or delivery as required.

These interactive online programmes using the Learning Management System 'Moodle' as the basis of programme delivery, with weekly web based (Adobe Connect) tutorials, provides a virtual classroom environment engaging students and supporting them through a programme they would otherwise not be able to complete.

4.2 Diploma in Conveyancing

The development, four years ago, of this programme came about in response to signalled changes to the New Zealand law which would open opportunities for a new profession that would require an education programme. The passage of the Lawyers and Conveyancers Act 2006 created a new profession of "Conveyancers" who were authorised to oversee property transactions. From August 1, 2008, this legislation has allowed conveyancers to perform a range of property related functions that were previously the sole preserve of solicitors within the New Zealand legal system.

The course design was completed and endorsed by the new national body, the New Zealand Society of Conveyancers, and we enrolled our first students in July 2010. As this is a new profession in New Zealand the student numbers are still relatively low, so that an exclusive agreement for provision was gained with the delivery to be conducted online to students throughout the country. The Diploma in Conveyancing (Level 6) is a two year, 240 credit qualification that meets the academic requirements for registration as a licenced conveyancer. There are six Level 5 papers to be completed in the first year and six Level 6 papers in the second year. Each paper worth 20 credits includes two pieces of assessed coursework and a final summative examination.

4.3 Graduate Certificate in New Zealand Immigration Advice (GCNZIA)

The GCNZIA was developed after our organisation secured a tender from the New Zealand Government in April 2011.The GCNZIA qualification was from inception designed to be available on a global basis and delivered totally online, including all the resources required to complete the programme. New Zealand is one of the few countries that allow non-New Zealand citizens or residents to become licensed as immigration advisers; consequently, access to the programme of study cannot be impeded by delivery locations. The Level 7 qualification comprises four compulsory courses of 15 credits each, delivered over one academic semester. Prior to entering the programme students must have a degree and if English is not their first language, an overall IELTS score of 7.0. A pass must be achieved in the course work for each course before the student is allowed to sit the final course examination.

4.4 Legal Executive Diploma

The third programme in this suite of programmes is the Legal Executive Diploma, originally developed by the New Zealand Law Society over 20 years ago to meet the demand for a formal qualification for legal executives and legal assistants. A legal executive is a person who works as a trained assistant to a lawyer or in a legal environment, typically including searching of public registers, and preparing and filing documents.

Our institution has delivered this programme for a number of years, and since 2010, an online version has been developed to reach a wider target market of potential students, including those who are not in one of the main centres where the programme is offered face to face, or whose employment does not allow them to attend classes. This Level 6 qualification comprises six compulsory courses of 20 credits each, delivered over a 30 week period. The online version again utilises the same technology and e-learning philosophy of the other two programmes discussed above but the assessment responsibility is with the New Zealand Law Society, so will not be considered here.

4.5 National Certificate in Real Estate (Salesperson)

This qualification has been taught locally face to face for several years and also in satellite campuses, with tutors travelling to outlying areas to deliver to student groups. However as the requirements of the programme increased with a rise in the number of credits to be covered (now four courses with a total of 46 credits) and commensurate increase to the time needed for teaching and learning (12 weeks full-time), an online version was developed in keeping with this department's philosophy and delivery;

although once again, the assessment requirements are set by the Industry Training Organisation and are therefore not considered here.

4.6 Assessment in Bopp online programmes

For the first two programmes above which are exclusive to our institution, we have responsibility for managing all the assessment. Each of these programmes has internal assessment of coursework often facilitated by the features of Moodle but the final summative examinations are paper based, conducted face to face (invigilated or proctored) in locations near where the students are resident, in order to avoid fraudulent acquisition of the qualification. The examination scripts are scanned and emailed back to Tauranga for marking, and the originals are returned by post.

In general the course assessments and final examinations meet the criteria of the Teaching and Learning Research Initiative reported by Davidson & McKenzie (2009) which provides a useful summary of the four key elements that most commentators agree to be essential to fair and just assessment management.

Manageability and Utility. Moodle features assist in managing assessment throughout the course. Students receive immediate feedback when features such as self-marking quizzes are used or model answers are provided at the completion of a task or test. The timing is also controlled by opening and closing the test at a particular time. *Moodle* also allows the teacher to see what parts of the course a student has viewed or attempted and for how long. Teachers are then able to contact the student if they appear to be having problems or falling behind in their coursework. However the summative assessment, an exam worth 50% of the marks, is paper based and conducted at an exam venue. Organising exams at a variety of venues around New Zealand and overseas is a demanding task for our administrators. It requires correspondence between the student and our organisation to establish the nearest main centre for that student and then the administrator must find a suitable venue with supervisors available at the time and date required. Contracts must be organised and afterwards payment made. Students who have been used to studying online using their computer and typing assessments and other coursework now must travel to a centre and write their exams by hand.

Validity. Assessments and exams are all internally moderated by the teaching staff and then externally, first by members of the industry and second, by representatives of another institution teaching a similar course. Assessments are checked against the programme's learning outcomes and care is taken in writing assessments to ensure the final exams are checking, reliably and consistently, what and how much students have learned.

Equity. All students are advised, before enrolling, of the computer requirements for the programme and as long as they have access to the internet are able to participate in the programme. The institution holds the licence for Moodle and Adobe Connect so students only have to log in. Once on the programme students are treated equitably regardless of which city or country they are actually logging in from. Restrictions on internet access in some countries and poor internet speed in some areas, can cause some inequity, and this has been a contributing consideration in our decision to make the final exam paper based, rather than online. The use of student identification numbers rather than names is standard practice in higher education and hardly needs further discussion, but is nevertheless one of the important principles of equity in assessment, so that any issues of diversity around ethnicity, religion, gender etc are negated as much as possible.

Integrity. As stated above proctored/invigilated examinations are held at the end of each course. Students attend an examination centre near their home. A supervisor's instruction book has been prepared and is sent to all examination centres. These instructions require the supervisor to check the students' identification and not allow them to bring anything into the room other than what is specified. They also manage the timing of the exam and watch the students during the exam and make note any sign/evidence of cheating.

Apart from ensuring these examinations meet the standards of valid, reliable, consistent, and equitable examinations, the costs of these off campus examinations is another management challenge. There is a

lot of administrative time and effort expended finding and contracting these venues and invigilators, particularly in countries around the world as we do for our GCNZIA students. Risk management to validate the students' identity and to minimise cheating in distance locations is also a challenging consideration. Our organisation needs to consider how well the current exam procedures meet the challenges of security, identification, and minimisation of cheating compared to the cost effective technology based solutions available. Considering the costs associated with our current method of managing final assessments, it may well be that future versions of technology based solutions will become increasingly competitive and perhaps these could be considered in the future.

5. CONCLUSION

Literature provides several possibilities for solving the challenges our institution faces in delivering summative assessment. As there is a requirement for this assessment to be by way of final exams, the question is how best to deliver these exams using the technology available in a secure, cost efficient way, and meeting the needs of our distance students. Further research into the use of non-proctored exams and remote controlled computers, while incorporating the design features reported above, could provide a modern practical and economic solution for both students and provider institutions.

I would be interested in creating a community of practice to discuss other organisations' solutions to these challenges, and look forward to sharing future developments and discussions with colleagues interested in this rapidly evolving field.

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