

eLearning Initiative for Education in ICT

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ABSTRACT

CPIT has recently started offering the Diploma in Information and Communications Technology (DipICT) (Level 5) in a blended delivery format to a small group of students under the Ministry of Education's Digital Opportunities (DigiOPs) Community Technicians Project. This paper documents, reflects on and reviews the initial set-up, preparation and start-up of delivering the DipICT (Level 5) to a group of students located in remote rural areas throughout New Zealand.

The results of this initial review, along with the two further stages of evaluative research, will help towards supporting the growth of flexible delivery methods that include eLearning and allow us to ensure effectiveness of such blends for future projects or instances of delivery.

Key words

Blended delivery, eLearning, flexible delivery, distributed learning

1. INTRODUCTION

In March 2004, Janne Ross, Head of School of the School of Computing at CPIT was approached by Dr Garry Falloon, Project Manager for Digital Opportunities Projects in the ICT Unit of the Ministry of Education. He advised CPIT that the Ministry was in the process of developing a new round of projects relating to the innovative use of ICT in supporting student learning and removing obstacles and barriers to ICT innovation in schools.

One of these new projects aimed to deal with the technical challenges that small remote schools have in dealing with hardware and software support. Dr Falloon said he was looking for the establishment of a course/qualification for people from such remote communities to train as "Community Technicians" so they would be able to provide basic computer technical support for schools, maraes, farmers, individuals, and

small local businesses within their community. He envisaged that such a programme might involve online and campus-based sessions as well as some kind of school-based project or assessment tasks. Participants should end up with a marketable qualification that could also form a basis for further study.

Dr Falloon invited CPIT to submit a possible programme option, either existing or proposed that would enable these students to cover general technical support and to gain a qualification. He forwarded a statement of preferred graduate profile and required knowledge and skill sets.

2. METHODOLOGY

The intended graduate profile and learning outcomes suggested by Dr Falloon were compared with those of a national DipICT (Level 5) as prescribed by NACCQ and a table of comparison was presented to Dr Falloon by the end of March 2004 (See Appendix 1).

CPIT's proposal to offer DipICT (Level 5) was eventually agreed upon in principle by Trevor Mallard, the Minister of Education.

CPIT then began a more detailed analysis of its capabilities to offer this programme, the cost of preparing and offering it, and the logistics of being involved, for the first time, in a reasonably large-scale distance learning opportunity.

Internal stakeholders were approached. These included the eLearning team, the special projects team, the finance controllers and staff from the institution's IT Division. Each raised relevant issues. A distributed learning environment was envisaged – with both on-line components and some on-site delivery. This required consideration of whether the development work would



be done by teaching staff or the eLearning team and whether existing staff could do the work of both development and of teaching. Workload issues were considered. Assessment challenges were discussed. These included discussion of the process of authentication for online assessment as well as discussion of which assessments would still require classroom attendance.

A traditional SWOT analysis was done. Strengths included CPIT School of Computing's experience in online delivery as part of several courses, and especially the success that Chris McCarthy had had with online asynchronous discussions (McCarthy 2002). In addition, the Ministry of Education was showing that it had confidence in CPIT's ability to succeed with an innovative undertaking.

One weakness identified was that the School, had not previously delivered fully distance education programmes and its experience with any fully online delivery was also limited. It would be a steep learning curve. This opportunity, though, would allow development of significant online material and to develop internal co-operation.

The major threat to the project was the concept of failure. This could have arisen from inexperience, high workloads, lack of available specialist staff, as well as having to work with students that had been selected by Ministry personnel rather than by CPIT's own Programme Leaders.

Project costings were drawn up and presented to Dr Falloon by the end of May, 2004. Two months of negotiation followed and on 12 August 2004 we were advised that the Minister of Education had signed off the final structure and costs.

CPIT then began the process of preparing for academic documentation and approval and to address and solve issues that had been raised during earlier discussions.

3. LITERATURE REVIEW

The authors conducted a review of literature relating to eLearning, distance delivery, blended delivery and distributed learning. Issues raised by the staff and inter-departmental meetings included how would the courses actually be delivered and how would they be assessed. Many, if not most, of the proposed courses included

significant practical content usually taught in a computer lab. Theory components were commonly assessed by examination.

Since issues of authentication surrounding assessment seemed to be the matter concerning staff the most, this area was researched first. This single issue of authentication has impact on the wider issues of academic rigour, quality control, and both programme and institutional credibility. Of course eLearning is not new, so there is a large body of work available for review and comparison, although only a few directly address the issue of authentication.

Kerka and Wonacott (2000), directly address the issue of "ensuring that the individuals completing the assessment are who they say they are" in the online environment. In reviewing several items of literature themselves, Kerka and Wonacott have some specific suggestions for security measures.

These measures include holding proctored (invigilated) examinations at remote sites, minimising objective tests and focusing on methods calling for analysis and application (eg case studies), carefully designing web-based instruction to convey outcomes the learner perceives as useful and desirable, and considering online exams in the same way as take-home tests.

Olt (2002) gives support to the fact that academic dishonesty is on the rise and in turn, gives some practical strategies for minimising this dishonesty in online student assessment. She focuses on the benefits of three key methods of online assessment as being more suited to counteracting student dishonesty.

The first of these three key methods involves having multiple, individualised tasks utilising several, short assessments throughout the course. This makes counterfeiting harder "because of the necessary coordination and planning involved for the student to arrange for someone else to do the work in a timely and appropriately specific manner." In other words, it is "very difficult for the student to solicit help throughout an entire course."

The second key method is to include assignments that require some degree of cooperation and coordination among the students on the course. Again it would be "very difficult for a student to find consistent help throughout a co-

operative project (assignment) of some duration and complexity.”

The third key method is to build into the course a “high level of instructor/student interaction.” Possible ways to achieve this are more frequent email contact and either synchronous chats or asynchronous discussion. The more frequent the contact the more difficult it will be for the student to find consistent help in responding to instructor emails and online discussion. Through this ongoing dialogue, the instructor will get a better “feel” for a student’s ability.

Shepherd (2003) gives a cut down version of his previous paper in the *eLearning Developers Journal*, and again, naturally enough, comes to the same conclusion – you must use an assessment centre for maximum authentication when assessing by way of examinations.

Rowe (2003) paints such a detailed and graphic account of cheating that he turns the pitfalls of online assessment into a veritable nightmare, and believes that the only solution is to have human-proctored assessment held in assessment centres.

The issue of how the courses would actually be delivered was, in part, determined by the initial request by the Ministry that “such a programme might typically involve online and campus-based sessions”. However, there was still the issue of how much development to do specifically for CPIT’s online learning method system of Blackboard. Should existing course books be re-developed into screen-sized learning modules delivered by Blackboard and would existing text books have their “plug-ins” used as an on-screen replacement?

Rennie (2003) is a major proponent of having the optimum mixture of different teaching media to provide consistency and quality in distributed learning to rural and remote areas where it is not normally available, and establishing online community identity using different blends of resources for tutor-student-student communication.

Rennie (2004) says that as many media as possible should be used ranging from face-to-face induction, text books, online teaching material, online discussion boards, email, video or telephone conference calls, to invigilated examinations – this he calls “distributed learning”. Rennie

believed that the imminent arrival of broadband access to the Internet, even in fairly remote areas (he was talking about the Scottish highlands and islands), would change the nature of what was possible to access online, and consequently the opportunities to vary the previously-preferred blocks of learning styles.

Harvey (2004) defines distributed education as what happens when the teacher and student are situated in separate locations and learning occurs through the use of technologies (such as video and internet), which may be part of a wholly distance education programme or supplementary to traditional instruction. Distributed education is similar but contrasted with distance education because it includes both education delivered wholly off-campus and elements of traditional education made available remotely. Therefore it is similar to blended learning.

According to Brown and Wheeler (2001) distributed education refers to flexible and location independent course delivery, covering the range of campus-based learning, distance education, work-based and home-based learning and was being driven by a new generation of telecommunications, in either cabled or wireless format.

4. OUTCOMES

The Ministry had planned to provide the students with laptops, cell phones, broadband Internet access, and would pay for any other expenses the students required – miscellaneous equipment and text books. This enabled CPIT to decide to keep the text books and course books already used by these courses in the face-to-face scenario.

Blackboard would be used as a means of directing students to weekly tasks, weekly readings, weekly online discussions and weekly communication with the Announcements section. Email would also be used as a means of regular communication and the Ministry was proposing regular telephone conference calls.

The students would also be given remote access (from their laptops back home in their rural area) via VPN (Virtual Private Network) to a powerful HP GSX server housed at CPIT. This would mean that via Remote Console, each student could access a virtual machine on the server. The server supports not only practi-

cal full working operating system but also full networking capabilities for a large networking infrastructure.

The students would also participate in a series of block courses held five times throughout the 18 months of the project. The first block course would be at the beginning and would also serve as the period of induction and team/group building.

All these media were totally consistent with the literature on blended and distributed learning.

Assessment would be the same as for the face-to-face scenario, but with a move towards being delivered online wherever possible. If it was possible to be online, then authentication would be resolved by asking the Principal of the school the student/technician was most closely affiliated with to invigilate the online examination – and sign appropriate forms accordingly. Where examination was not able to be offered online, then the examination would be held during the next on-campus block course and invigilated by the CPIT staff member as usual. Again, the adopted practice here was consistent with the literature on the subject.

All the proposals were taken back to relevant School of Computing staff and to the eLearning team, and accepted by all. Teaching staff were then able to commence development of material for posting onto Blackboard and to liaise with the eLearning staff.

An intense period of preparation followed until the students arrived for the first block course and the Associate Minister of Education, David Benson-Pope, visited to officially launch the project on 27 January 2005.

5. CONCLUSIONS/ RECOMMENDATIONS

Delivery of this programme began on 23 January 2005 with the first three courses ready to be delivered online, and one more ready for its practical component to be delivered in the block course. The students had been selected by the relevant rural school, in conjunction with the Ministry, and all the equipment had arrived. The launch was deemed highly successful with all required loose ends well tied up.

Since then two more courses have been de-

veloped for online delivery, three students have pulled out and two have joined the scheme. The Minister, the Ministry and the school-clusters were delighted with the project and its successful beginning. During the rest of this year further courses will be developed, more block courses held and a formal evaluation of current practices will commence.

It is recommended that the team involved continue researching the Community Technicians Project now that it appears to be successfully under way. This evaluation will provide further information and allow the team to reflect and to implement any modifications that might be required. Finally, it is recommended that the team conclude this three-stage research plan with a final analysis of the effectiveness of the whole project.

REFERENCES

- Brown G and Wheeler S (2001) "An Evaluation of Wireless Local Area Networks in Distributed Education" E-Learning Conference and Expo, Washington D.C., USA 17-20 April, 2001
- Harvey, L (2004) "Analytic Quality Glossary" retrieved May 13, 2005 from <http://www.qualityresearchinternational.com/glossary/distributededucation.htm>
- Kerka, S and Wonacott, M (2000) "Online Assessments: Principles and Practices – Security" ERIC/ACVE Assessing Learners Online Practitioner File 1 and 8
- McCarthy, C (2002) "From there to eternity" eFest Conference and TalkFest, Hamilton, 11-12 October, 2002.
- Olt, M (2002) "Ethics and Distance Education: Strategies for Minimizing Academic Dishonesty in Online Assessment" retrieved June 7, 2004 from <http://www.westga.edu/~distance/ojdla/fall53/olt53.html>
- Rennie F (2003) "The Use of Flexible Learning Resources for Geographically Distributed Rural Students" Distance Education, May 2003 vol 24, no. 1 pp 25-39, Carfax Publishing, London, UK.
- Rennie F (2004) "The importance of the online component in the blended learning experience for distributed rural students" retrieved May 13, 2005 from <http://kn.open.ac.uk/public/getfile.cfm?documentfileid=4875>.
- Rowe, N (2003) "Cheating in Online Student Assessment: Beyond Plagiarism" retrieved June 7, 2004 from <http://www.cs.nps.navy.mil/people/faculty/rowe/dlcheat.htm>
- Shepherd, E (2003) Delivering Computerized Assessment Safely and Securely The eLearning Developers' Journal October 20, 2003 pp 1-9

APPENDIX 1

Comparisons of MoE requested outcomes with DipICT (Level 5) modules

	CPIT Code	CPIT Course Name	MoE Outcome
	Compulsory		
1	NDBA500	Business Applications	Ability to self-organise and understand processes of running a small business, and Knowledge of how to grow initial enterprise into a sustainable small business
2	NDBC500	Business Communications	Ability to communicate technical issues and explanations to non-technical users and clients
3	NDDT500	Data Organisation	Compulsory DipICT (Level 5) paper (An introduction to the way computers represent data, fundamental data types and organisation, and how data is protected in typical data processing systems.)
4	NDHF500	Hardware Fundamentals	Ability to advise schools on the purchase of hardware and software based on end user requirements
5	NDIP500	Interpersonal Skills	Good communications and interpersonal skills, and Use initiative and independent judgement
6	NDPP490	Programming Concepts & Tools A	Compulsory DipICT (Level 5) paper (An introduction to the process of solving simple computer programming tasks through the study of logic methods, problem decomposition, and translation into a structured programming language - eg Pascal)
7	NDSO500	Systems Overview	Superior problem analysis, and Knowledge of multiple pathways for problem resolution, and (An understanding of Information Systems and the process of systems analysis and design)
8	NDET600	Ethics & Professionalism	Motivation to provide high levels of service to schools and other clients
	Others		
9	NDNM500	Network Administration Introduction	Ability to advise schools on the purchase of hardware and software based on end user requirements, and Set up LAN topology and hardware.
10	NDOS500	Operating Systems Introduction	Installation, configuring and upgrading of software and operating systems using standard software packages. Customisation of software to suit end user requirements. Configuration of desktops, etc.
11	NDWX500	Work Experience	Evaluation of the student by observation in the workplace and by discussion with other interested parties in the community
12	NDHS600	Hardware Skills	Troubleshooting problems with computer systems, including troubleshooting hardware and software issues, email, network and peripheral equipment problems, repairs and corrections as required, and Building basic PC systems from board level. Competent in installing and configuring new components such as hard drives, RAM, peripheral cards, CD drives, etc, and Competent in identifying issues associated with malfunctioning hardware, diagnosing problems, and sourcing and affecting solutions

	CPIT Code	CPIT Course Name	MoE Outcome
13	NDNM600	LAN Administration	Pre-requisite for other papers (Provides students with the knowledge of the features and issues associated with providing and maintaining local area networks)
14	NDNM630	Network Infrastructure	Installing and configuring basic TCP/IP fat client networks at hardware and software level (not cabling). Capacity in Net BEUI, TCP/IP, DHCP, DNS, (etc) installation and configuration
15	NDNM640	Network Security	Apply or improve security measures related to the use of computers and networks (later became replaced by OS650)
16a	NDNM611	Operating Systems (MS Windows Server)	Installation, configuring and upgrading of software and operating systems using standard software packages. Customisation of software to suit end user requirements. Configuration of desktops, etc.
16b	NDOS650	Operating Systems (Unix/Linux)	Be able to deal with the various Unix or Linux based networks in selected schools
17	NDSP590	IT Tools Intermediate A (MS Word & Excel)	Ideally, graduates from this course would be able to provide a level of advice and guidance to teachers and other clients on using computers more efficiently and is assisting them to understand the operation and capabilities of a range of standard software
18	NDSP592	IT Tools Intermediate B (MS Access & PowerPoint)	Ideally, graduates from this course would be able to provide a level of advice and guidance to teachers and other clients on using computers more efficiently and is assisting them to understand the operation and capabilities of a range of standard software