

Certificate in ICT: Is it meeting the needs of the Stakeholders?

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ABSTRACT

In 2011, one day prior to the devastating earthquake, Christchurch Polytechnic Institute of Technology (CPIT) introduced the new integrated certificate and diploma programme. These two innovative programmes were designed to ensure all students could start at a level in which they could achieve and then continue to higher level programmes at their own pace, a concept that is part of the Tertiary Education Commission vision. Although the earthquake delayed the start of the first offering of the programmes the results of the first three semesters prove the worth and student success of these integrated programmes of study.

Keywords

Integrated ICT Qualifications, Certificate in ICT qualifications, Innovative Integration of ICT Qualifications, Staircasing Secondary and Tertiary ICT Studies

1. INTRODUCTION

In 2010 Christchurch Polytechnic Institute of Technology (CPIT) developed and were approved and accredited to teach a new level 4 Certificate in Information and Communications Technology (CertICT). This certificate is integrated with the new Diploma in Information and Communications Technology (DipICT) level 6 as the first semester of study. It is also a stand-alone certificate and is a precursor to the Bachelor of Information and Communication Technologies. It was designed in part to replace the “Blue Book” level 5 qualifications. This paper reports on the results of the students during the first three semesters of study and their subsequent further study choices.

2. Context

The School of Computing at CPIT had been offering the National Advisory on Computing Qualifications national curriculum (Blue Book) for over ten years. It was perceived that the programmes of study and the course content were not meeting the needs of the current students and employers [1]. The Diploma in Information and Communications Technology (level 5) contained courses starting at level 5. Students applying to enrol on this diploma from High School had only studied to Level 3 and would normally not have met the required entry standard for a degree programme. This led to students being required to study at a

much higher level than they were initially capable and consequently retention and success rates were lower than would normally be acceptable.

2.1 Redevelopment and stair-casing

To address the gap between high school study levels and the certificate and diploma at tertiary level it was decided to redevelop local qualifications that started at level 4 yet still met the levels of study required. The Tertiary Education Commission (2004) as cited in Nesbit and McCarthy [2] decided on “pathways and stair-casing as a priority area for a strategic review”. Hence, stair-casing students was a priority for CPIT. It was necessary that the design of the new qualifications stair-cased students from the certificate to the diploma and also gave them the opportunity to transfer to the degree programme. Boyd, MacDowall and Ferral [3] describe a number of case studies of students who progressed to degree level study having not initially planned to do so. It was necessary to give students who initially wanted to complete a certificate the chance to move to the diploma and then to the degree programme, as well as giving students who wanted to enrol in the degree programme a chance to meet the entry requirements.

2.2 Methodology

The data were gathered from the CPIT student management system, Jasper. The student management system contains all the personal information about students as well as recording their course enrolments and grades. No personal information was required or gathered for this study, only quantitative data such as the numbers of course passes, and the enrolments and further enrolments of the student. The raw data was then reviewed and analysed.

3. STRUCTURE OF THE NEW QUALIFICATIONS

As described in section 2 two new qualifications were designed and developed alongside and integrated with the BICT.

3.1 Certificate Level 4

The new certificate at level four comprises four 15 credit courses all at level four and taught in one semester. They are all compulsory and there are no electives. The four courses are:

- CICT400 Introduction to Information Technology
- CICT410 Practical Skills in ICT
- CICT420 Information and Communication Skills
- CICT430 Problem Solving

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The content of these four courses is fairly standard broad brush introduction to the field of Information and Communications Technology. CICT400 covers an introduction to hardware, operating systems and peripherals of a computing system. CICT410 covers keyboard skills and an introduction to the Internet. CICT420 gives an introduction to communication in an ICT environment using a range of software typically available for these purposes. Finally CICT430 is a mathematics course in a problem solving context that also covers spread sheets.

Based on a review of the research of the teaching of introductory programming, and the typical success rates, it was a deliberate decision not to include programming in the first semester of certificate and diploma programme.

Students who successfully complete the certificate can apply for the Bachelor of Information and Communication Technologies (BICT) programme, a further three years for study, or they can continue with the Diploma in Information and Communications Technology (DipICT), level 6, which requires a further three semesters or 18 months of study.

3.2 Diploma level 6

The diploma is a level 6, 240 credit qualification. The one semester certificate comprising the four courses mentioned above is the first semester, or 60 credits, of the level 6 diploma. A further four 15 credit courses make up the second compulsory semester of the diploma. These include an introduction to programming at level 4 and three level five courses: Computer Architecture (a BICT course), Internet Technologies (a BICT course) and Software Applications. The students are able to enrol on the degree courses as they have now met the required entry criteria for the BICT programme.

For the final 120 credits, one year of study, the students can then choose pathways or ‘specialisations’, these include, networking, IT support or software development.

Students who successfully complete the two year level-6 diploma can then transfer to the BICT with at least one year of credit. It is hoped that these programmes of study, being new and innovative, will meet the criteria of the new qualifications in ICT following the New Zealand Qualifications Authority (NZQA) 2013 TROQ review.

4. RESULTS

The first offering of this new certificate and the first semester of the new diploma commenced on February 21st 2012. After one and a half days of teaching, at 12.51pm on February 22nd, 2012 Christchurch was hit by the 6.3 magnitude earthquake which meant that all classes were cancelled and the CPIT buildings closed for four months. Some of the students hadn’t attended a class as their timetable meant they didn’t start until Tuesday afternoon. So the new certificate and diploma started all over again four weeks later on a different campus.

4.1 2011 Certificate students

In 2011 there were 53 students who were enrolled in the certificate (Table 1), and 55 students who were enrolled in the diploma (Table 2), studying the four level-four courses.

Of the certificate students 26 passed all four courses on the first attempt, while 11 did not pass any courses on the first attempt. We cannot speculate on why these students didn’t pass any courses as this was the year of the earthquake and circumstances were not normal. The highest number of passes in a course (79%)

was for CICT400, Introduction to Information Technology, with the lowest being CICT430 Problem Solving. This is consistent other data on the “mathematics” course within BICT programme.

Table 1. 2011 Certificate students

2011	CICT400	CICT410	CICT420	CICT430
Passes	42 79%	36 68%	35 66%	31 58%
Incomplete/ Withdrew	7 13%	13 25%	15 28%	15 28%
Mean score (excl INCs)	79	64	73	68

4.2 2011 Diploma students

Table 2. 2011 Diploma students

2011	CICT400	CICT410	CICT420	CICT430
Passes	53 96%	47 85%	40 73%	47 85%
Incomplete/ Withdrew	1 2%	7 13%	14 25%	5 9%
Mean score (excl INCs)	77.5	74.6	81.0	68.4

A slightly different pattern is seen for those students who enrolled with the intention of continuing with the diploma. Of the certificate students, 38 passed all four courses on the first attempt, while 2 did not pass any courses on the first attempt. The percentage that passed all four courses was 69% with 96% of students passing CICT400 and 85% passing CICT430.

4.3 2012 Certificate students

In 2012 the students were placed in classes depending on their intentions after the first semester. Based on the experience in 2011 there appeared to be three “types” of students:

- Students who wanted to do the level 6 diploma
- Students who were enrolling in the certificate to meet the BICT entry requirements
- Students who only wanted to do the certificate (at this stage)

In reviewing the 2011 results, the students in the first two categories had higher pass rates so they were put in classes together and the third category were put in separate classes. We were not intentionally “streaming” students; it was more of a pedagogical attempt to ensure every student had the opportunity to learn at their own pace.

As can be seen from Table 3, the pass rate of students who were identified as “certificate only” students was significantly improved when comparing to the same group of students in 2011.

Table 3. 2013 Certificate students

2012	CICT400	CICT410	CICT420	CICT430
Passes	31 86%	28 78%	26 72%	28 78%
Incomplete/ Withdrew	5 14%	5 14%	8 22%	4 11%
Mean score (excl INCs)	86.8	67.9	72.5	63.2

In 2012 the students who passed all four courses on the first attempt was only 49%, while in 2011 the same group of students pass rate was 69%, a considerable improvement.

4.4 2012 Diploma students

In semester 1, 2012, 27 students were identified as continuing with the diploma after the first semester. Results were significantly higher with this group for which 23 students (85%) passed all four courses (Table 4).

Table 4. 2012 Diploma students

2012	CICT400	CICT410	CICT420	CICT430
Passes	25	24	25	21
	100%	96%	96%	84%
Incomplete/ Withdrew	0	1	1	0
	0%	4%	4%	0%
Mean score (excl INCs)	88.8	74.1	80.6	67.1

When compared to the same group of students from 2011, we see an improvement in pass rate from 69% to 85%.

4.5 2011 vs. 2012 Certificate students

The pass rates for students in 2012 increased over the same group in 2011 (Figure 1). The most significant improvement was in the “mathematics” course CICT430 Problem Solving where the pass rate improved from 58.5% to 77.8%.

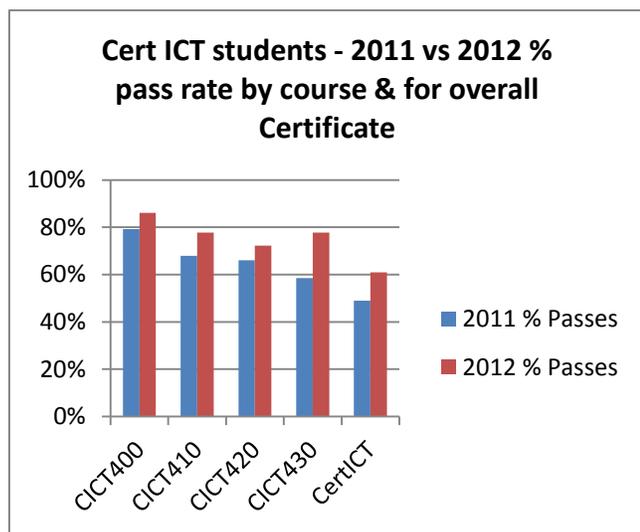


Figure 1. Certificate students 2011 vs. 2012 pass rates by course

It must be noted also that the Department of Computing had an “80/80” challenge in 2012. This was to strive to 80% retention and 80% course pass rate in all courses and programmes.

4.6 2011 vs. 2012 Diploma students

As with the certificate students 2011 vs. 2012 there was significant improvement in the diploma students pass rates for 2012 except for CICT430 (Figure 2).

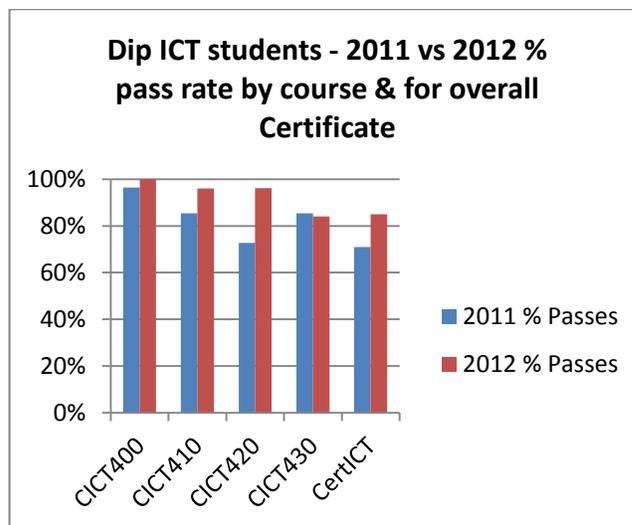


Figure 2. Diploma students 2011 vs. 2012 pass rates by course

In 2012 the only course that didn’t improve the pass rate was the “mathematics” course CICT430 which had the most improvement for the certificate students. However the pass rates for the two years were very similar with the 2011 pass rate at 85% and the 2012 pass rate at 84%. CICT430 Problem Solving certainly achieved the 80/80 challenge for this course in 2012.

5. PROGRESSION TO FURTHER STUDY

As the new qualifications are integrated and the intention is to staircase students into higher qualifications data on the students’ progression was analysed.

5.1 Successful Certificate students 2011

Of the 26 students who passed the Certificate in ICT in 2011 at their first attempt, 23 (88%) progressed on to study higher ICT qualifications (Table 5).

Table 5. Students who completed the Certificate in ICT in 2011

	Number	%
No further course at CPIT	3	12%
DipICT & progressing	8	31%
DipICT but stopped	2	8%
BICT & progressing	6	23%
BICT then transfer to DipICT	1	4%
BICT but stopped	4	15%
Another IT related CPIT course	2	8%
Total	26	

However, as at August 2012 just 17 of those 23 (74%) are still continuing with their studies; 2 of the 23 students continued on to a Networking diploma rather than an ICT qualification offered by the Department of Computing. Although they completed the certificate on the first attempt, three students have not continued their study. A further six students enrolled in further study at CPIT but have since failed to continue. Overall 65% have

continued successfully; this doesn't include the students who have not enrolled again at CPIT yet were successful.

5.2 Successful Certificate students 2012

Of 22 students who passed the Certificate in ICT in Sem 1 2012 at their first attempt, 21 (95%) engaged in further study at CPIT. Nineteen of these (86%) progressed on to study higher ICT qualification; one of the 22 students continued on to a Computer Technician Certificate at CPIT (Table 6).

Table 6. Students who completed the Certificate in ICT in 2012

	Number	%
No further course at CPIT	1	5%
DipICT	8	36%
BICT	9	41%
GradDipICT	1	5%
Another IT related CPIT course	1	5%
Another non-IT CPIT course	2	9%
Total	22	

5.3 Successful Diploma students 2011

Of 38 students (Table 7) who passed the four courses of the Certificate in ICT in 2011 at their first attempt while enrolled in the Diploma in ICT, 34 (89%) continued to study the Diploma in ICT or transferred to the BICT and, as at August 2012, all but one of these students are still continuing with their studies.

Table 7. Students who completed the first four courses of the Diploma in ICT in 2011

	Number	%
No further course at CPIT	4	11%
Stayed in DipICT & progressing	18	47%
Transferred to BICT & progressing	15	39%
Transferred to BICT but since stopped	1	3%
Total	38	

5.4 Successful Diploma students 2012

Of 24 students who passed the Certificate in ICT in Semester 1 2012 at their first attempt while enrolled in the DipICT, 23 (96%) continued to study the Diploma in ICT or transferred to the BICT (see Figure 4) and as at August 2012 all these students are continuing with their studies.

Table 8. Students who completed the first four courses of the Diploma in ICT in 2012

	Number	%
No further course at CPIT	1	4%
Continuing in DipICT	18	75%
Transferred to BICT	5	21%
Total	24	

6. CONCLUSION

Redesigning and integrating programmes is a complex and difficult process. Any redesign must address the needs of all the stakeholders and allow for stair casing or progression for the graduates of the programmes. This is in alignment with the aims of the TEC. This paper looked at the results for the first three semesters and the progression to further study students chose after the first semester. A mitigating factor that was not foreseen and caused delay was the earthquake in Christchurch in February 2011.

Based on the data that was retrieved and analysed the first semester and stand-alone certificate appears to be meeting the aim and objectives of the programme. Students are achieving success and moving to higher level qualifications. The first students who completed the certificate programme in 2011 will be graduating from the diploma in December 2012 and the first students of the BICT who came through the certificate programme will be graduating in July 2014 and then further data will be available to track the success of the first certificate students.

7. REFERENCES

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