ICC and CC(I): Twelve Years of Introductory Computing Certificates

Donald Joyce,Deirdre Billings, Neil Comins,

Kay Fenton, Mae McSporran

UNITEC Institute of Technology
Auckland, New Zealand

djoyce@unitec.ac.nz

Proceedings of the 15th Annual NACCQ, Hamilton New Zealand July, 2002 www.naccq.ac.nz

ABSTRACT

In this paper the five staff who have led the introductory computing certificates at UNITEC since 1991 reflect on the reasons why such programmes have proved popular with staff and students alike. They explain how the programmes evolved to meet changing needs and discuss why UNITEC is happy that it developed its own programme rather than offering the unit standards based National Certificates in Computing, as some NACCQ members chose to.

Keywords: Introductory certificates, unit standards

1. INTRODUCTION

In 1988, Carrington Polytechnic (now UNITEC Institute of Technology) began teaching the Certificate in Business Computing (CBC), a new national qualification developed by the National Advisory Committee for Computing Qualifications (NACCQ). In subsequent years the Advanced Certificate in Business Computing (ACBC) and the National Diploma in Business Computing (NDBC) were introduced. In 1991, the Introductory Certificate in Computing (ICC) was introduced, with the primary aim of preparing students to enter CBC. A strong linkage developed between ICC and CBC, with one third to one half of each CBC intake consisting of ICC graduates. Other ICC graduates obtained data entry positions without further qualifications or moved on to programmes in Office Systems or Business Studies.

During 1995 and 1996 UNITEC developed local replacements for these national programmes:

- a one semester Certificate in Computing (Introductory) to replace ICC
- a one year Certificate in Computing Systems (CCS) to replace CBC
- a two year Diploma in Computing Systems (DCS) to replace ACBC
- a three year Bachelor of Computing Systems (BCS) to replace NDBC (see Joyce (1996a) for more details).

The Certificate in Computing (Introductory) programme (or CC(I) for short) assists less well prepared students to get ready for the CCS, DCS or BCS - it is not seen as a qualification that leads directly to employment as a computer professional, although some CC(I) graduates may obtain lower level positions in the computing field. Students enter CC(I) from a level 2 or 3 national or local certificate, or from sixth form or seventh form, or as adults retraining. Selection

is based on achievement, aptitude, attitude and communication skills.

Achievement may be demonstrated by previous academic results, which range from minimal to postgraduate degrees! Aptitude is measured by a four part test covering English, Arithmetic, Reasoning and Logic (Joyce, 1998). Attitude and communication skills used to be assessed during an interview but "it was realised that this had become too time-consuming. Now only a few students who are borderline on the entry criteria are asked for an interview" (McSporran, 1998).

In semester 1, 2002, nearly 12 years after ICC was developed, UNITEC has more than 160 students enrolled in CC(I) and is conducting the five yearly programme review required under its quality management system. As part of this process, staff have reviewed and reaffirmed the programme's philosophy, aims and objectives. The most likely outcome of the review appears to be a minor restructuring in order to provide a better fit with the other computing programmes.

2. PHILOSOPHY

The central philosophy of the CC(I) programme is based on the principle that the qualification should provide an intellectual and applied framework through which students can develop the necessary abilities to solve simple problems within the field of computing and information technology. The programme aims to facilitate the integration of theory and practice and enable students to progress to a higher level of technical competence. This is achieved by threading through all courses the development of the essential literacy, numeracy and problem solving abilities required for further study in the field of computing and information technology. The knowledge, skills and life experience that each potential student brings to the programme are acknowledged, respected and built upon. Course materials are developed with a strong focus on student goals and student centred learning is emphasised. The generic skills of learning, acquired or enhanced during the CC(I) programme, will be transferable to their further studies.

3. AIM AND OBJECTIVES

The aim of the CC(I) programme is to provide a bridge for students who have not met the selection criteria for higher level computing programmes but should be able to do so after completing the Certificate in Computing. The objectives of CC(I) are that students should:

- remedy any deficiencies in analytical or communication skills
- obtain a broad understanding of the applications of information technology
- acquire technical knowledge about computing systems
- increase their motivation and preparedness for further learning.

4. ADMISSION

Initially ICC was aimed at New Zealand educated students, most of whom had English as their first language but had not been very successful at school and were not qualified to enter CBC. However UNITEC soon found that there were growing numbers of immigrants and international students who were prevented from entering CBC because of their lack of English language skills. These English as an Additional Language (EAL) students were attracted to ICC as a stepping stone into CBC. The same situation persisted when CC(I) replaced ICC and BCS replaced CBC/ACBC/NDBC. Most EAL students sat the aptitude test and scored high marks on Arithmetic, Reasoning and Logic but failed to meet the BCS requirements for English. On the other hand, many NZ-educated students met the English standard but not those for Arithmetic, Reasoning and Logic. This led to some problems that are outlined in the next three sections.

5. LITERACY

Most NZ educated students could communicate freely in class, but many had marked problems with written English. EAL students had significant problems with those sections of the programme where use of English was inportant, especially the Business Communication and Interpersonal Skills components. We have tried various experiments, including putting all the EAL students together (this was quickly abandoned); and offering an additional language course for EAL students, most of whom passed a mathematics pre-test and did not need to attend mathematics classes. None of these experiments have been persisted with.

6. NUMERACY AND PROBLEM SOLVING

Most NZ educated students had significant problems with mathematics and the mathematics teachers had to start from level 1 (or below). This was frustrating for most of the EAL students, who had passed mathematics at degree level. So we introduced a mathematics pre-test, taken during orientation or the first week of classes, and exempted those who obtained 80% or more from attending mathematics classes. This had four virtues:

- reducing the size of mathematics classes so more individual assistance could be given
- reducing the frustration of the EAL students who were exempted
- reducing the embarrassment of the remaining students, who felt freer to ask very basic questions
- giving the exempted EAL students more time to improve their language skills.

Until recently the Problem Solving component has been delivered by the same staff who teach the communication course(s), but now we are seeking to integrate it with the mathematics component, which will require a different approach..

7. STRUCTURE

Initially CC(I) followed the ICC approach of having lots of small courses (see Joyce (1999) for details), and allowing students to fail some (although not the communication and numeracy courses) and still obtain a certificate. It has since been restructured as six courses of 10 or 12 credits, with two at level 3 and four at level 4, and students who pass any five will obtain a certificate. It is still necessary to reach the necessary standards of English and Mathematics to enter BCS, but not to complete CC(I).

During 2000, a proposal was put forward for further restructuring to five 12 credit level 4 courses, with passes in all five required in order to gain a certificate. This would have given CC(I) the same structure as the Certificates in Business Administration and Computing (BAC3 and BAC4). This proposal was shelved for a variety of reasons, but has been revived as part of the current five yearly programme review. This time it is likely to gain acceptance (with slight differences in detail), partly because level 4 courses are being eliminated from the BCS.

8. ASSESSMENT

At the time that UNITEC was developing CC(I), many other NACCQ member institutions were introducing the new national certificates, NCC level 3 and NCC level 4 (Joyce, 1996b). UNITEC decided not to follow that path because of some early experiences with trying to offer unit standards and meet NZQA's complex and lengthy moderation requirements. Instead we stuck with the "tried and true" assessment methods used in ICC - 80% pass, 95% merit and resits.

In 2000, after an assessment workshop conducted by the Academic Development Unit, a proposal was put forward to drop the pass mark to 50% and eliminate resits. This would have brought CC(I) in line with all the other programmes in the school (including the Certificates in Business Administration and Computing, which had recently changed from unit standards with mastery assessment to local courses with 50% pass mark and no resits). The proposal was not supported by the external members of the programme committee (who represent the advisory committee) and was withdrawn. The only small change has been to allow one resit per assessment item and not restrict the number of courses passed with resits that could be credited to the certificate.

9. ATTENDANCE AND SUCCESS RATES

We used to insist on attendance and require students to give reasons for absence, but it became an administrative nightmare with 160 students and more than a dozen staff. We then tried a system where the only sanction is not being able to take resits for a subject where attendance has been less than 80%. Even this has now been abandoned and some academic staff believe that student performance has declined as a result.

In the past it was common for 60% or more of CC(I) students to qualify for entry to BCS, but this percentage has dropped below 50% and not all those who qualify do enter BCS. Possible reasons include:

- lower attendance rates
- raising the level of some courses from 3 to 4
- a number of international students do not consistently attend classes or take assessments

- a number of EAL students use CC(I) to improve their English as a stepping stone to university.

10. CONCLUSIONS

As noted by Joyce (1999) "academic structures and immigration patterns may change dramatically, but the need for introductory (bridging) qualifications in computing persists." UNITEC staff members involved in CC(I) are glad that they never trod the "unit standard" path, having heard the complaints of colleagues at UNITEC and other NACCQ member institutions who did (Goodwill, 1999; Kelly, 1998; Snell & Conley, 2000). Having dropped the national qualifications at levels 5 to 7 in favour of our own degree, we are very comfortable continuing to "fine tune" our own "tailor made" introductory certificate.

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