

# Students on the Staircase: an analysis of stair-casing students

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## ABSTRACT

This paper presents an investigation into the characteristics of students who staircase from certificate level computing programmes into level seven degrees or level five diplomas in ICT. The study aimed to discover if certain types of students were more likely to staircase and to also identify which students were most likely to be successful in higher levels of study.

## Categories and Subject Descriptors

K.3.2 [Computers and Education]: Computer and Information Science Education – Curriculum, *Information systems education*.

## General Terms

Measurement, Performance, Human Factors

## Keywords

ICT education, staircase education, success and retention.

## 1. INTRODUCTION

A number of New Zealand tertiary institutes offer lower level ICT qualifications (level three and level four) as a way for students to staircase into higher levels of ICT study, i.e. level five diplomas and level seven bachelor degrees [3, 5]. The Universal College of Learning (UCOL) in Palmerston North has two such programmes that are delivered on campus, the level three Certificate in Information Technology for Business (CITB) and the Certificate for Advanced Computer Users (CACU) [5], both of which are designed to allow students to staircase into the level five Diploma in Information & Communications Technology (DipICT) or the level seven Bachelor of Information & Communications Technology (BICT) [1]. UCOL also offers the National Certificate in Computing (level 2, 3, and 4) distance education programmes which can also be used to staircase into higher level qualifications (see Figure 1). This study focuses primarily on those students who undertook one or more of the lower level staircase qualifications and examines their subsequent progression into higher levels of ICT education (i.e. level five to seven).

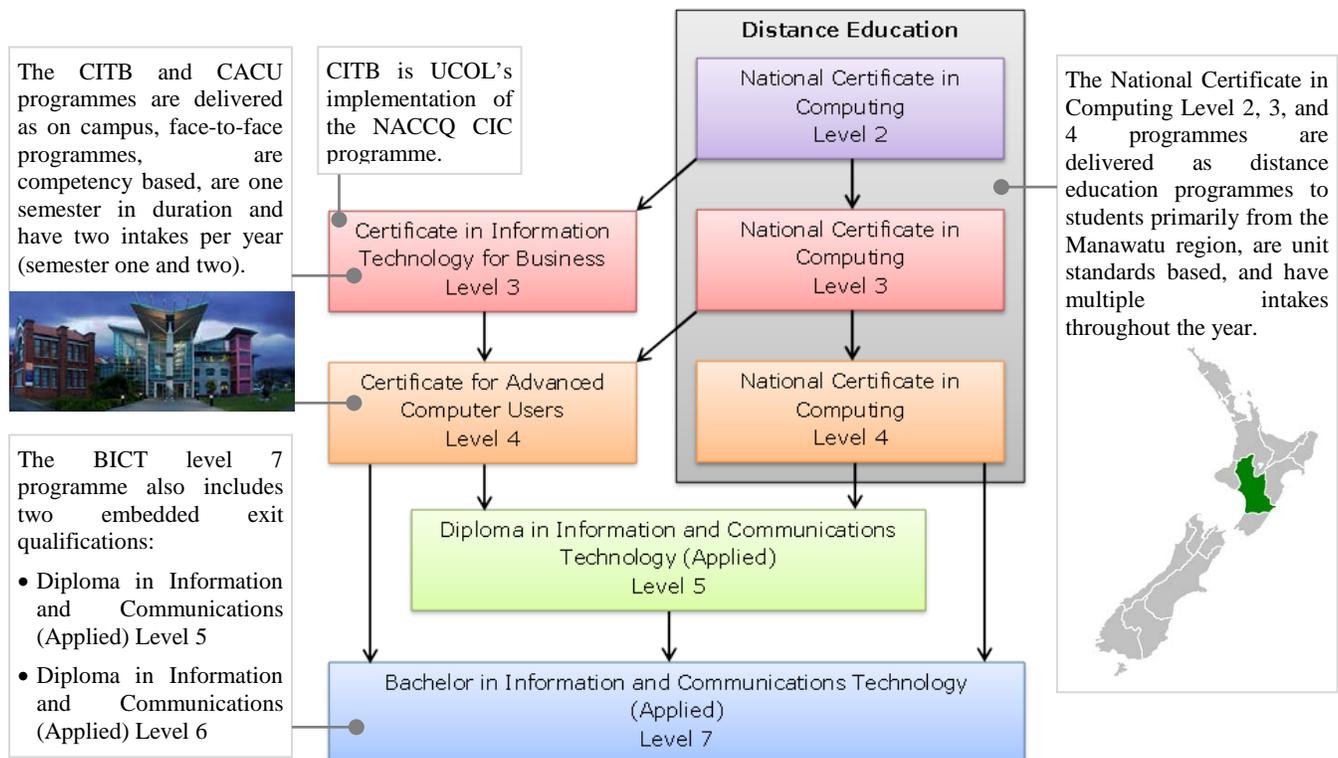


Figure 1. UCOL ICT Staircase Structure

## 2. METHODOLOGY

Due to this study's focus on student progression from lower level ICT programmes into higher level programmes, UCOL's student management system functioned as the primary data source for this study. However, qualitative data was also collected from teaching staff in order to provide insight into some of the unquantifiable characteristics of stair-casing students; these qualitative measures will be described and discussed in the next section. The student management system was used to generate data which was then analysed in order to identify those students who had first undertaken either or both of the lower level programmes before stair-casing into either the level five diploma or level seven bachelor programme. Although the system contained records that dated back over the last decade, it was decided that 2008 would be the earliest student records that would be examined. This decision was due to a curriculum rewrite of the level five and level seven

programmes that had implemented in the same year. The next section will present the findings from the data analysis phase.

## 3. Results

This section will present statistics relating to student numbers for each of the higher level programmes, as well as statistics relating to those students who progressed through one or more programmes of study.

Figure 2 shows the number of students who undertook either the BICT or DipICT programme during 2008 to 2011, as well as the number of students who had progressed up the staircase for each year. Figure 3 presents the gender breakdown for the entire DipICT and BICT student population over the four year period. Figure 4 presents the gender breakdown for only the stair-casing students over the same four years. The Figure 4 stair-casing students are a subset of the Figure 3 students.

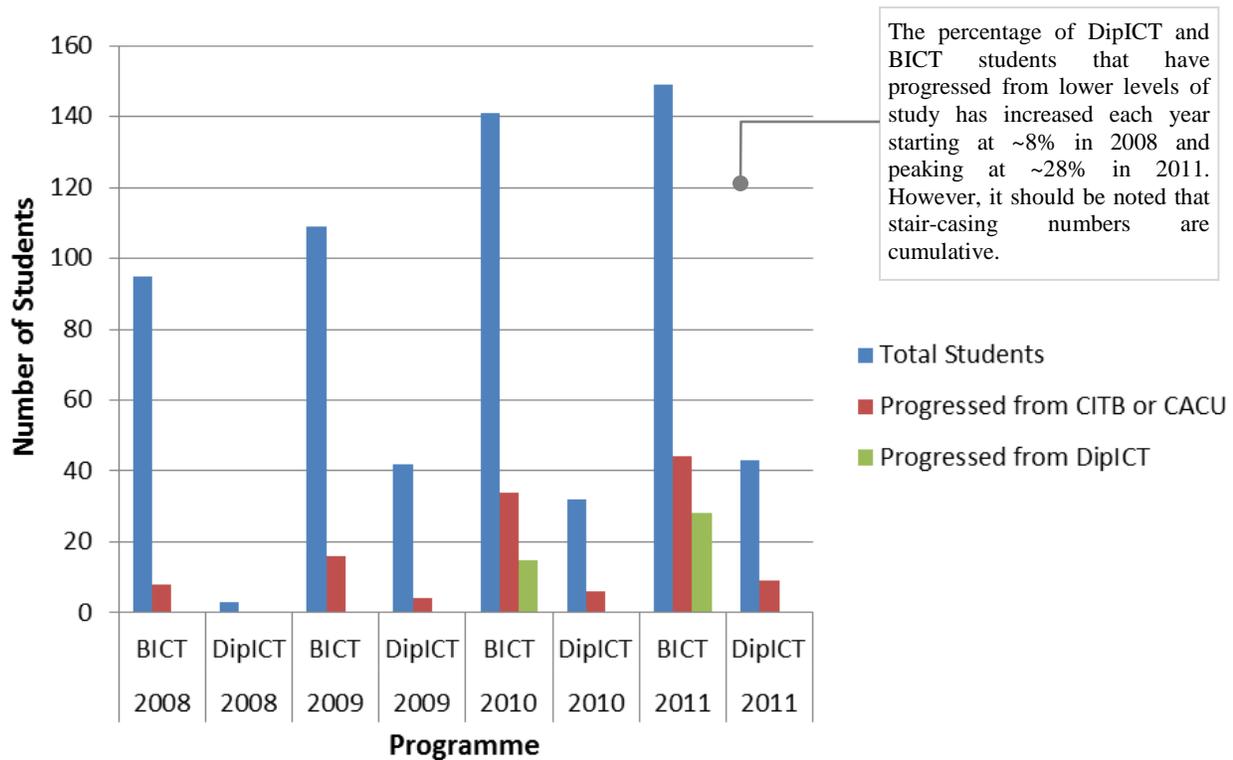


Figure 2. BICT and DipICT student numbers with stair-casing students from CITB, CACU and DipICT programmes.

Although the percentage of female students is slightly lower amongst the stair-casing student group, it is interesting to note that the male to female ratio amongst the stair-casing student population is essentially the same as the ratio found amongst the entire BICT and DipICT population. This suggests that gender does not influence a student's decision to staircase into higher levels education.

The overall male dominant demographic is also aligned with previous studies that have consistently found the ICT and computing industry to be significantly slanted towards the male

populous [2, 4]. This includes higher education ICT and computing programmes as well as people working in the ICT and computing industry.

Figure 5 presents distribution of outcomes throughout the entire BICT and DipICT student population compared to the distribution of outcomes amongst only the stair-casing students. Figure 6 presents the distribution of outcomes by gender amongst the stair-casing students.

## BICT & DipICT Students

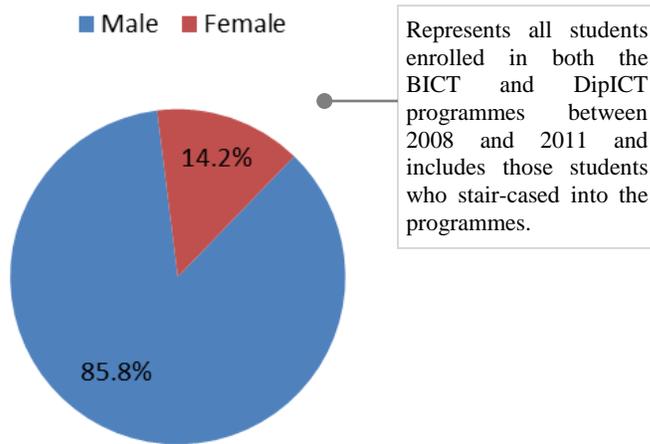


Figure 3. Gender breakdown for BICT and DipICT students

In order to generate the statistics used for figures 5 and 6, students were categorized according to their outcomes level as perceived by teaching staff. The four outcomes categories were: Excellent, Good, Okay, and Poor. It should be noted that the four outcome categories relate to student academic success, however they also encompass a number of qualitative student attributes. The four categories will now be described in detail.

Students categorised as Excellent were those students who consistently achieved high academic results, engaged in class

## Staircase Students

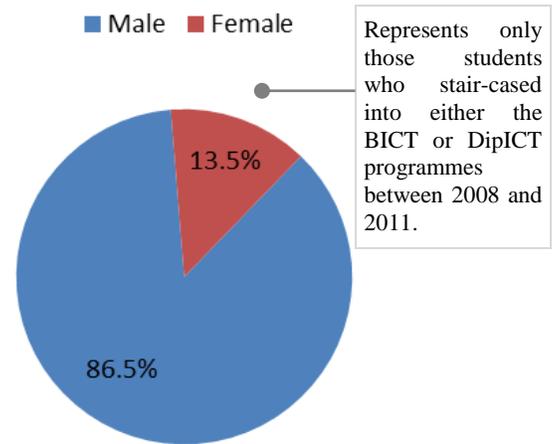


Figure 4. Gender breakdown for staircase students

activities, were helpful to other students, and were often found to complete work early, found assessments easy and/or went above and beyond assessment requirements.

Students categorised as Good were those students who usually achieved medium to high academic results, worked hard to achieve good grades and complete assessments, and had reasonably high levels of engagement.

### BICT and DipICT vs. Staircase Students: Outcomes

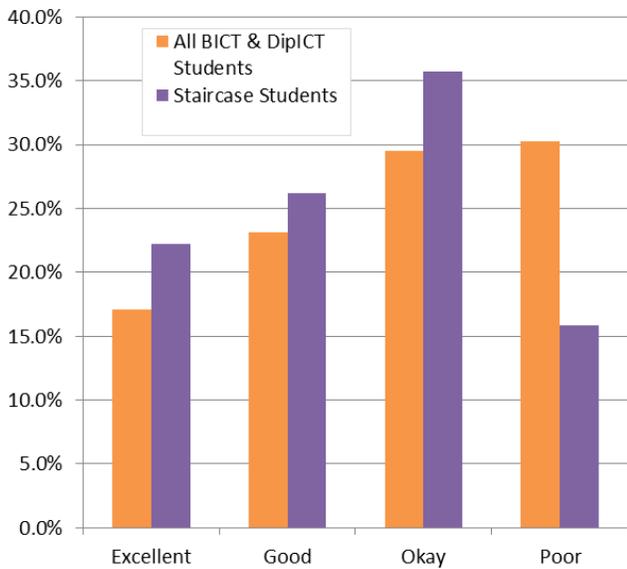


Figure 5. Outcome distributions for BICT and DipICT students and staircase students

### Staircase Students: Gender & Outcomes

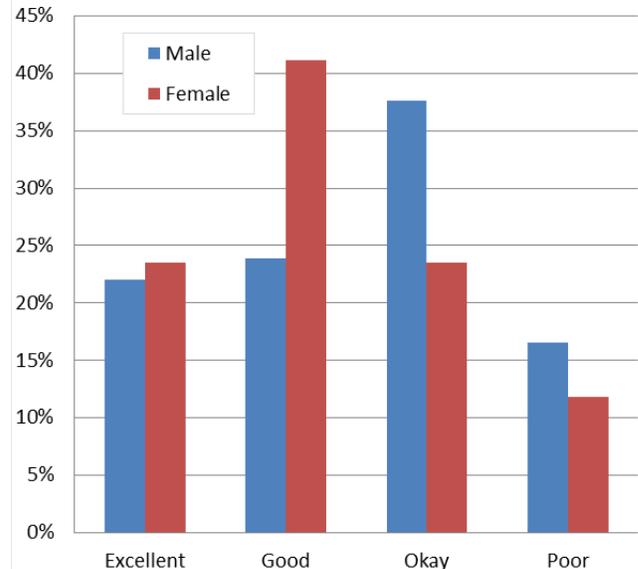


Figure 6. Gender outcomes breakdown for staircase students

The key difference between an Excellent and Good student was essentially how easy they found the course content. Although both Excellent and Good students may achieve high academic results, Good students were perceived as needing to try a lot harder to achieve those results.

Okay students were those students who consistently achieved medium to low academic results, showed lower levels of engagement, often left assessments to the last minute and/or produced work of a lesser standard. Although Okay students would often scrape through some assessments, they would generally succeed on a pass/fail perspective.

Students categorised as poor were those students who often achieved low academic results, often showed very low levels of engagement, were consistently unsuccessful in summative assessments, and tended to be overall more academically challenged than other students. This category also included the ghost cohort, i.e. those students who enrolled in a programme but did not engage or complete any assessments.

In reference to Figure 5, it is interesting to note that stair-casing students have a noticeably lower level of Poor students (~14%) when compared to the wider BICT and DipICT student population. This indicates that students who take a stair-cased approach to higher education are more likely to maintain higher levels of success and achievement.

Figure 6 highlights a significant gender difference in the distribution of student outcomes amongst stair casing students. Female students on the staircase are most likely to be categorised as Good students, whereas Male students are more likely to be categorised as Okay. This could suggest that male students are more likely to be content with 'just passing', while at the same time suggesting that female students often display a more focused work ethic.

#### 4. CONCLUSIONS

The goal of this paper was to conduct an analysis of students who stair-cased into higher levels of ICT education at a New Zealand tertiary institute. The study has found that the male to female ratio amongst stair-casing students is essentially the same as the ratio amongst the wider ICT student population. The study also found that stair-casing students were less likely to be considered Poor than students in the wider ICT student population. Finally, female stair-casing students were also more likely to be considered Good with regards to outcomes than were their male counterparts.

Although the results from this study suggest some interesting characteristics of stair-casing students, it should be noted that the findings are based on a unique sample from a single regional tertiary institute. Therefore generalisation of the findings to the

wider ICT education sector would be premature. The study was also limited by the number of years of student records available for analysis (i.e. 2008-2011). Finally, the results presented in this study could also have been influenced by the recent change in government funding for ITP's (i.e. funding based on success, retention and completion).

Future work will include expanding this analysis to determine if the gender difference present amongst stair-casing students is also present in the wider ICT population. Also, due to the fact that this study has only focused on a four year period, future work will involve the analysis of similar data over the coming years. Furthermore, in order to complement the four outcome categories quantitative analysis into the actual academic achievement levels of stair-casing students will be conducted. Analysis into the impact of age of stair-casing students is also a possible avenue of investigation. The researchers are also considering further exploration into some of the themes that have emerged from this study. This further exploration will likely take the form of quantitative measures, in order to capture students' self-perceptions of their outcome category. Focus group interviews will also be used to gather more in depth information regarding staircase student characteristics.

#### 5. REFERENCES

- [1] Cleland, S., Snell-Siddle, C. & Steele, A. (2010). *An Apprenticeship-Based ICT Degree*. In R. Coll (Ed). Conference Proceedings: New Zealand Association of Cooperative Education Annual Conference (pp. 23-26). Palmerston North, New Zealand.
- [2] McCarthy, D.P. (2009). *Engendering ICT: Emerging women ICT professionals in Aotearoa-New Zealand*. (Unpublished master's thesis). University of Otago, Dunedin, New Zealand.
- [3] Otago Polytechnic. (2012). *BIT Information Sheet*. Retrieved May 2, 2012, from Otago Polytechnic: <http://www.otagopolytechnic.ac.nz/images/information%20sheets/ICT%20IN.pdf>
- [4] Snell, S. & Snell-Siddle, C. (2009). *Gender and ICT: Toys for the Boys or Pearls for the Girls?*. In D. Fisher, R. Koul, & S. Wanpen (Eds). *Science Mathematics and Technology Education: Beyond Cultural Boundaries. Proceedings of the Fifth International Conference on Science, Mathematics and Technology Education*. (pp. 485-489). Udon Thani, Thailand.
- [5] UCOL. (2012). *BICT Student Handbook 2012*. Retrieved May 2, 2012, from UCOL: [http://www.ucol.ac.nz/Lists/Programmes/Attachments/13/hb\\_BICT\\_Dip%20ICT%20Handbook.pdf](http://www.ucol.ac.nz/Lists/Programmes/Attachments/13/hb_BICT_Dip%20ICT%20Handbook.pdf)