

---

# An Apprenticeship Based ICT Degree: Student Perceptions

**Sandra Cleland**

UCOL  
138 Queen St.  
Palmerston North, 4442 NZ  
s.cleland@ucol.ac.nz

**Aaron Steele**

UCOL  
138 Queen St.  
Palmerston North, 4442 NZ  
a.r.steele@ucol.ac.nz

**Catherine Snell-Siddle**

UCOL  
138 Queen St.  
Palmerston North, 4442 NZ  
c.snell-siddle@ucol.ac.nz

**Abstract**

This paper explores student perceptions of a proposed apprenticeship based ICT degree. A cross section of current ICT students from a New Zealand Polytechnic were surveyed after being presented with the concept of the proposed apprenticeship based ICT degree. Both qualitative and quantitative data were collected from first, second and third year students. The data was analysed against student academic history to identify trends. These trends were compared to eligibility criteria which were based on first year student

---

This quality assured paper appeared at the 2nd annual conference of Computing and Information Technology Research and Education New Zealand (CITRENZ2011) incorporating the 24<sup>th</sup> Annual Conference of the National Advisory Committee on Computing Qualifications, Rotorua, New Zealand, July 6-8. Samuel Mann and Michael Verhaart (Eds).

performance. The results provided valuable insights to the researchers allowing restructuring the proposed apprenticeship based ICT degree.

**Keywords**

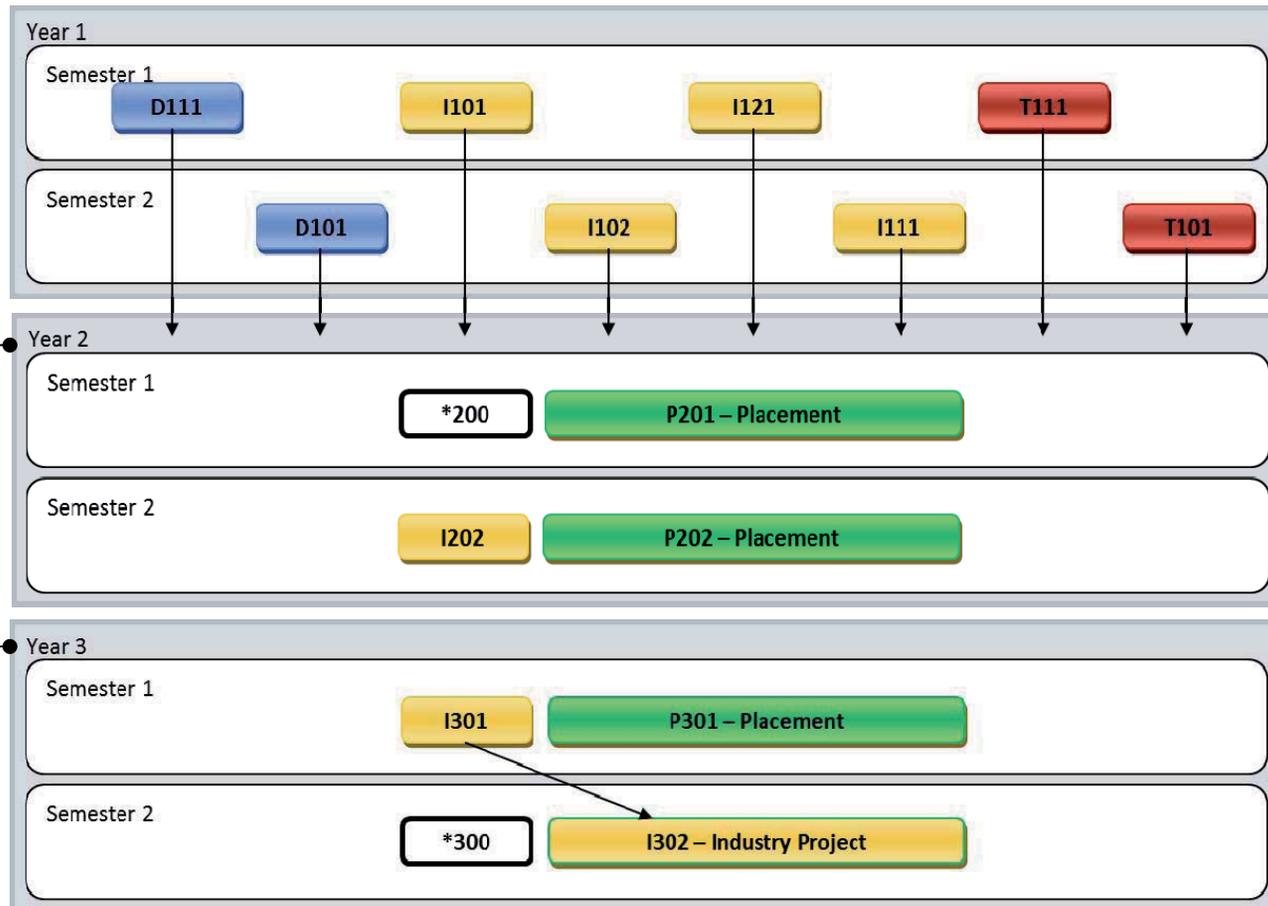
Apprenticeship, co-operative education, curriculum design.

**Introduction**

A number of New Zealand tertiary institutes offer ICT related bachelor degrees that include an industry based capstone project or work experience type component in the final stages of the qualification (AUT, 2010) (EIT, 2010) (Otago Polytechnic, 2010) (UCOL, 2010) (Weltec, 2010). This cooperative educational component specifically aims to prepare students for a career in the ICT industry by providing them with real world experience and industry connections.

In 2010 the authors presented a concept paper that proposed an apprenticeship based ICT degree built around an existing ICT bachelor's qualification (Cleland, Snell-Siddle, Steele, 2010). This existing qualification is a three year program with students being required to undertake a 45 credit (approximately one semester) industry project in their final year of study. This proposed structure shared the same first year as the existing ICT degree, with significant industry placement

components embedded into years two and three (refer to Figure 1).



The second year of the proposed apprenticeship based degree requires students to undertake a 15 credit second year paper and a 45 credit placement during each semester.

Semester one of the third year also requires students to undertake a 45 credit placement before embarking on their final 45 credit industry project.

This paper builds on this initial research by exploring student perceptions of the proposed apprenticeship based ICT degree in the following areas: difficulty, time requirements, educational benefit, likely work readiness, structure of the placements, and whether or not they would take up this option.

### **Methodology**

A cross section of current ICT students were surveyed after being presented with the concept of the proposed apprenticeship based ICT degree. This sample was obtained by approaching first, second, and third year students during compulsory class time to ensure a high response rate.

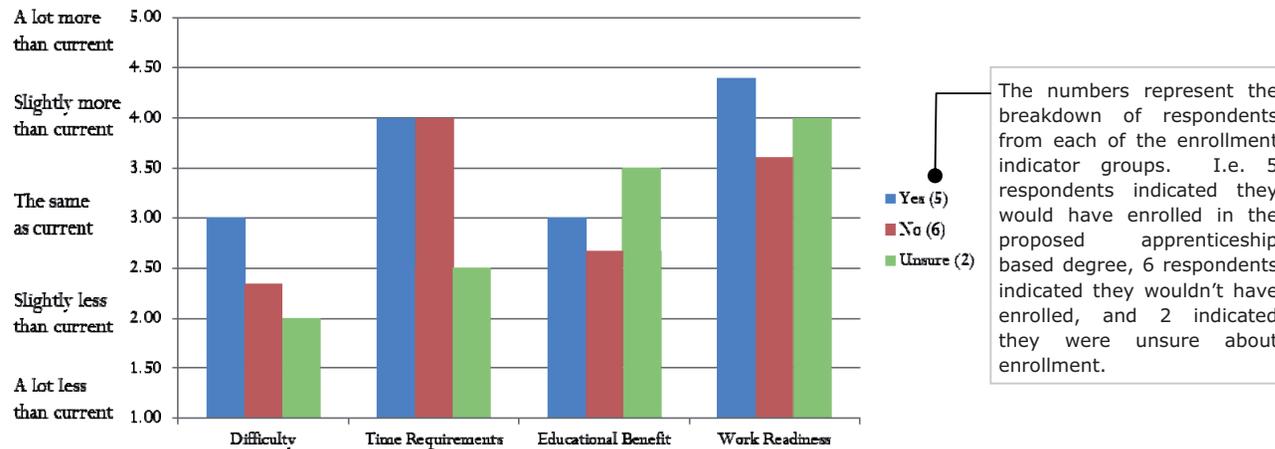
Both qualitative and quantitative data were collected from students through the use of a survey instrument. The survey instrument was coded in order to map student response to academic history. The survey asked students to compare the proposed apprenticeship structure with their current programme of study. The students were presented with four likert scale items to gain their opinion on whether the apprenticeship structure would be more difficult, have greater time requirements, would provide more educational benefit, and better prepare them for the work force. Each likert scale was followed with an open ended question to

allow students to provide more detail on these areas. The survey also asked students, if it were available would they have enrolled in the proposed apprenticeship based degree. Again, this was followed by an open ended question to allow additional qualitative feedback.

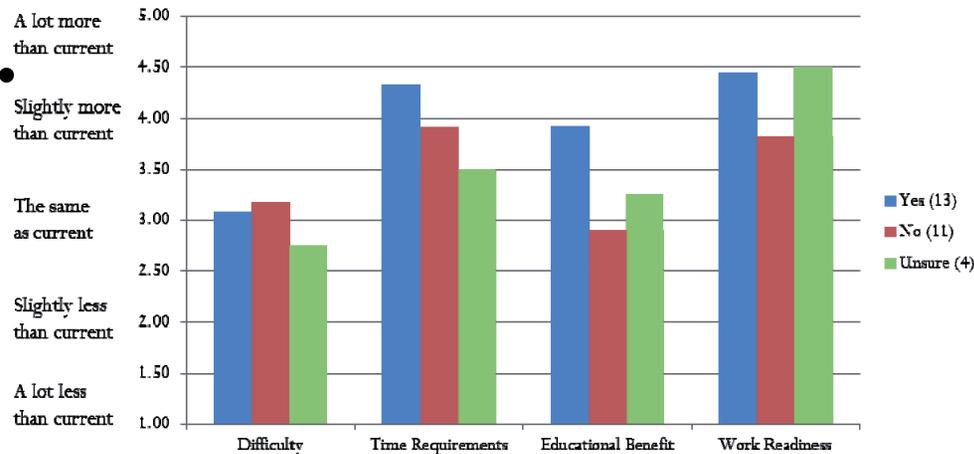
### **Results**

Eighty-five students participated in the survey. This consisted of thirteen students from year three, twenty-eight students from year two, and forty-four students from year one.

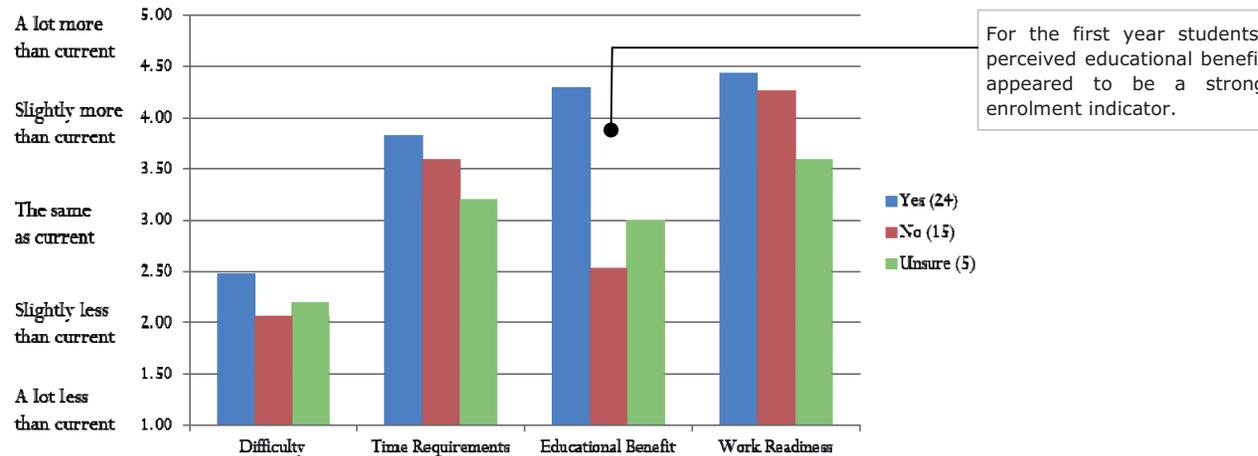
The quantitative results are presented in figures 2, 3, and 4 (years one, two, and three respectively). Responses are grouped based on the student's indication as to whether they would have enrolled in the apprenticeship option if it had been available (i.e. Yes, No, Unsure). The bars in each graph represent the mean response to the likert scale items from the respective groups. Each likert scale had five points: a lot less than current, slightly less than current, the same as current, slightly more than current, a lot more than current (where current represents the existing degree structure). Each point was given a corresponding numerical value (i.e. 1 to 5) as shown on the graph.



**Figure 2.** Year three perceptions of difficulty, time requirements, educational benefit, and likely work readiness of apprenticeship based structure compared to existing delivery mode grouped by enrollment indicator.



**Figure 3.** Year two perceptions of difficulty, time requirements, educational benefit, and likely work readiness of apprenticeship based structure compared to existing delivery mode grouped by enrollment indicator.



**Figure 4.** Year one perceptions of difficulty, time requirements, educational benefit, and likely work readiness of apprenticeship based structure compared to existing delivery mode grouped by enrollment indicator.

The qualitative feedback was similar for second and third year students with a majority indicating a concern regarding possible narrow specialisation in the apprenticeship structure and lack of synthesis of knowledge normally obtained during core second year papers in the existing degree. The second and third year students also indicated a preference for the placement components to be reduced or start later in the programme of study.

The qualitative feedback from the first year students also showed some concern about narrow specialisation and conflicts between placement time requirements and existing work commitments. However, a large number of respondents showed enthusiasm towards the placement pathway citing it as a preferred method of

learning and seeing it as early opportunity to build professional relationships with industry.

When survey results were compared to academic histories a noticeable trend emerged. Students who were interested in enrolling in the apprenticeship based degree had a lower level of overall academic achievement than those students who indicated they were not interested in enrolling. This was especially noticeable amongst the first year respondents with those interested in enrolling having a mean GPA of 4.27 (~B-) and those not interested in enrolling having a mean GPA of 6.80 (~A-).

### Conclusion

The survey results provided clear insight into the level of student interest in the proposed delivery mode. The

students currently over half way through their study emphasised the importance of the diversity and depth of core second year papers. This was unexpected but is seen as a positive reinforcement of the content of the current curriculum.

The students who were new to study appeared overall enthusiastic about the apprenticeship delivery mode, perceiving it as an easier pathway which would better prepare them for the work force. However, only those students who saw a greater educational benefit indicated they would enroll in the apprenticeship degree.

In the initial proposal, entry into the apprenticeship pathway was to be restricted to high performing students based on first year results in order to maintain positive relationships with industry stakeholders. High performing students were defined by the researchers as those students with consistently high grades, a professional attitude, and good interpersonal skills. The majority of students who indicated they were interested in enrolling did not demonstrate sufficient levels of academic achievement meaning that they would not have been eligible to enter the proposed pathway.

The feedback gained from the survey has indicated to the researchers that a reworking of the structure of the proposed placements components is necessary. This will likely include reduction of the second year placement components in order to allow for the critical breadth and depth of learning the current students see as essential to becoming well rounded ICT professionals.

The next stage in this research is to present the modified structure to industry stakeholders in order to gauge levels of interest, identify possible host organisations, and expose any potential issues that may arise from facilitating placement students.

## References

- AUT. (2010). *Bachelor of Communication and Information Sciences Overview*. Retrieved February 9, 2010, from AUT: <http://www.aut.ac.nz/study-at-aut/study-areas/computing--mathematical-sciences/qualifications/undergraduate-degrees/bachelor-of-computer-and-information-sciences---overview>
- 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.
- EIT. (2010). *Bachelor of Computing Systems Programme Overview*. Retrieved February 9, 2010, from EIT: [http://www.eit.ac.nz/study\\_programmes/bachelor\\_of\\_computing\\_systems\\_bcs.aspx](http://www.eit.ac.nz/study_programmes/bachelor_of_computing_systems_bcs.aspx)
- Otago Polytechnic. (2010). *BIT Information Sheet*. Retrieved February 9, 2010, from Otago Polytechnic: <http://www.otagopolytechnic.ac.nz/images/information%20sheets/ICT%20IN.pdf>
- UCOL. (2010). *BICT Fact Sheet*. Retrieved February 9, 2010, from UCOL: [http://www.ucol.ac.nz/Lists/Programmes/Attachments/13/BachICT\\_WEB.pdf](http://www.ucol.ac.nz/Lists/Programmes/Attachments/13/BachICT_WEB.pdf)
- Weltec. (2010). *Information Technology Programme Guide*. Retrieved February 9, 2010, from Weltec: <http://www.weltec.ac.nz/Portals/0/IT%20Programme%20Guide%2009%20March.pdf>