

The PASS Project - Identifying Parameters Affecting Student Success

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ABSTRACT

Since (very) late last century, a research team at UNITEC Institute of Technology has been working on the PASS project, endeavouring to identify Parameters which Affect Student Success, both on our computing programmes and in the workplace after graduating. Four related strands are being investigated:

- ◆ is there any correlation between personal factors (age, ethnicity, gender, study process and motivation) and success on the programmes? * is there any correlation between academic background (general, English and mathematics) and success on the programmes?
- ◆ what aspects of programme structure, course delivery and support do students believe help/hinder them in their studies? * what knowledge, skills and attributes of the graduates do employers and the graduates themselves find of greatest value in the workplace? This paper describes the research process and discusses some of the issues that have arisen.

Keywords Research projects, process, protocols



1. INTRODUCTION

UNITEC Institute of Technology in Auckland is the second largest provider of computing qualifications in New Zealand. Students may obtain certificates (five or ten months full time), diplomas (two years full time), bachelors degrees (three years full time), postgraduate diplomas (one year full time), or masters degrees (two years full time). The mix of students is very varied, ranging from some with no formal school qualifications to others with several postgraduate qualifications. A high proportion (more than a third) are recent immigrants for whom English is not their first language. Many use the qualifications as a staircase, beginning with a certificate, moving on to a diploma or degree, and even to a postgraduate qualification.

UNITEC computing staff, both teaching and administrative, are concerned to ensure that

- ◆ applicants are placed in the programmes most suited to their abilities, needs and career plans (Joyce, 1998)
- ◆ programme structure, course delivery and support systems help students to succeed on the programmes (Joyce, 1994)
- ◆ graduates and their employers find that the knowledge and skills acquired at UNITEC meet work place requirements.

Four research projects are under way to help meet these three objectives:

- ◆ nearly 1500 student files have been examined to establish their age, gender, ethnicity, educational background before enrolling, and performance on our

programmes (certificate, diploma or degree), and correlations between the different variables are being computed.

- ◆ first and third year students are being asked to fill out a questionnaire designed to establish what motivates them to succeed
- ◆ students, graduates, employers and advisory committee members are being asked their views on the current requirement to take a “business context” course in the first year of the degree programme
- ◆ graduates are being asked to complete a survey about their current employment and the relevance of their UNITEC programme. In the next four sections, the research process for each project is described and some of the issues that have arisen are discussed.

2. CORRELATION

The data required for calculating the correlations was distributed in at least three places, so a spreadsheet was set up and a research assistant employed to bring all the data together. Age, ethnicity and gender were held in one section of the electronic student management system, and UNITEC academic results in another, whereas details of previous academic background were on the paper enrolment forms in the individual student files. Inevitably, there were some gaps in the data - in particular incomplete UNITEC results and students who did not provide full details of their academic background. There were also variations in assessment systems - for example the grading system for school certificate has been changed at least twice. A coding system was developed for ethnicity and level of qualification to simplify subsequent data analysis.

One issue that arose with this project concerned the research assistant having access to student files. The chair of the UNITEC research ethics committee confirmed that formal ethical approval was not required because all the data already existed and the personal data had been supplied on the understanding that it could be used by UNITEC staff for teaching and administrative purposes. However to preserve confidentiality, the research assistant was recruited from outside UNITEC (usually we would employ a UNITEC student).

Correlations are now being computed to determine whether there is any evidence that students of a particular age, ethnicity, gender or academic background are more successful on our programmes. Given that many of these variables interact (for example a majority of Indian and Chinese students are older males with degree qualifications), it may prove necessary to undertake

further statistical analysis to see which factors are most important. As a sub-project, Ranjana Shukla is examining correlations between marks for written assignments, practical tests and theory examinations in first year computing courses, to see whether some student groups do significantly better in one type of assessment, when compared to other groups. Some of the initial findings are presented in a companion poster (Joyce, Knight, Kolahi and Shukla, 2000).

3. MOTIVATION

The study process and motivation questionnaire, consisting of 42 questions, was developed in Australia and has been extended by an extra 10 questions developed by Susan Foster for use with computing students at UNITEC. It uses a five point Likert scale for each question and special response forms for direct computer processing. Because most of the questions will be in common, some interesting comparisons should be possible between Australian and New Zealand students.

When it was proposed that first and third year students be asked to fill out the questionnaire in class, the question arose what procedure should be followed when staff wish to conduct research on students that does not directly relate to the students' course of study. The concern was that the students (and the course lecturer if different from the researcher) might resent losing class time, especially if several research projects were involved. It was decided that approval should be sought from the head of department, research coordinator, programme coordinator and course lecturer. The first three would determine if the research was needed and appropriate, the lecturer would determine if and when the time could be made available.

4. COMPULSION

Many New Zealand computing qualifications, especially those in the polytechnic sector, have at least two compulsory courses: one concerned with communication and one that covers the business context in which most computing is done. This is true of all the computing certificates, diplomas and degrees at UNITEC. Teaching staff, advisory committee members and other employers are very much in favour of this compulsion, however many students would prefer to focus totally on computing subjects and are not well motivated to study “extraneous” subjects.

The business context course in the UNITEC Bachelor of Computing Systems degree is taken by all full time students in their first semester and is a pre-requisite for compulsory second year courses. Pass rates are low and declining and student feedback has been largely negative.

Various stratagems have been tried to increase student motivation, including moving the course to a different semester from the compulsory communication course, using videos and an uptodate text book full of case studies, and having the chair of the advisory committee visit the classes to stress how much the course was valued by employers.

The latest approach involves asking first, second and third year students to fill out questionnaires, holding focus groups with current students, and interviewing staff, graduates, employers and members of the advisory committee. Further details of the process and the preliminary results may be found in Glennis Goodwill's paper at this conference (Goodwill, 2000).

5. PREPARATION

Although UNITEC staff and advisory committee put a lot of time and thought into assembling the right "ingredients" (in the form of programme structure and course content) and staff put a lot of energy into the "cooking process" (in the form of lectures, laboratories, assessment and tutorial assistance), it's still true that "the proof of the pudding is in the eating". Consequently an important part of our quality assurance is finding out what jobs our graduates get and how well they (and their employers) feel their UNITEC programme has prepared them for the workplace.

In the early 1990s, when we offered the NDBC suite of programmes, we used to survey our graduates and their employers and get very useful feedback. However, when a corporate research unit was established at UNITEC, they took on the graduate survey, using a standard form which did not ask some of the key questions we had been asking. Now that the UNITEC wide process is well established, we have been able to get approval from the corporate research unit to survey our own graduates separately and we will endeavour to catch up on the backlog of three years' degree graduates. All that is needed now is ethical approval from the UNITEC research ethics committee, who require to see the questionnaire, the letter that will accompany it and a six page application detailing how the data will be obtained, processed, stored and disposed of!

This research is supported by a grant from the National Advisory Committee on Computing Qualifications, which is also supporting similar research being conducted at the Waikato Polytechnic and at Massey University at Wellington. Having compared questionnaires before conducting the research, in order to identify commonalities, the researchers intend to compare results and identify similarities and differences.

6. CONCLUSION

The effort involved in the four projects is substantial but should result in a wealth of information that can be used to improve our selection processes, curriculum development, delivery and support systems. Along the way we will have learned a lot about designing, managing and conducting targeted research and put in place some useful procedures and protocols that will make future projects easier!

7. REFERENCES

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