Concise paper

What Makes Polytechnic Students Employable?

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ABSTRACT

Each year the tertiary institutes within New Zealand produce several hundred computing graduates who have to compete for work in a competitive and volatile employment market. Over the years the relative merits of University, Institutes of Technology or Polytechnic (ITP), and Private Training Establishment (PTE) computing graduates have been compared, in an attempt to establish who produces the best graduates. While the debate relating to which sector produces the best work ready graduates will always continue, there are a number of attributes that can be identified which relate to the contribution of ITP computing graduates in the work place.

This paper which is a collaborative effort between an ITP academic and an industry practitioner, focuses on a successful New Zealand company that has employed many ITP trained graduates over the last seven years and attempts to identify some of the attributes that make ITP graduates employable.

The paper starts by looking at the computing graduate profiles of several ITPs and attempts to identify key attributes that the profiles have in common. The paper also investigates how the students employed by Sysdoc Group have performed when compared to the profiles and attempts to identify other common attributes that are may not be addressed by the graduate profiles. The paper also reports on the results of interviews conducted with the ITP graduates working for the company. Interviews aimed at identifying the extent to which past students feel that the ITP sector has delivered in producing work ready employees.

The paper will be of interest to all those who are involved in producing computing graduates, to employers of computing graduates and to prospective computing students who are trying to decide where to study.

1. INTRODUCTION

In Generic Capabilities of ATN University Graduates, Bowden *et al*. (2000) supply a definition of graduate profiles/attributes that has become commonly accepted and applied in many Australian universities:

> *Graduate attributes are the qualities, skills and understandings a university community agrees its students should develop during their time with the institution. These attributes include, but go beyond, the disciplinary expertise or technical knowledge that has traditionally formed the core of most university courses. They are qualities that also prepare graduates as agents for social good in an unknown future.*

Graduate profiles have been used for some time to identify in broad terms the preferred outcomes of vocational educational programmes, and they are seen as an important component of the course design process. In the information technology (IT) area of the tertiary education sector, one would expect that the learning outcomes identified within the graduate profile to reflect the needs of the business organizations that are likely to employ IT graduates.

This paper builds on previous work by Clear (1998), who attempted to identify generic graduate profiles for certificates, diplomas and degrees and Young, Senadheera and Clear (2001) who looked at trends in knowledge, skills and abilities from an industry perspective. The primary goal of this paper is to identify if graduates from computing Institutes of Technology degrees are perceived as meeting the stated outcomes of the graduate profile. Employers and Institute of Technology computing graduates were surveyed and the findings are presented.

The paper commences by looking at the evidence in support of using learning outcomes and graduate profiles as a measurement tool for educational success, and then discusses the similarities that exist between the graduate profiles of several different Institutes of Technology. The paper then presents the results of the employer

and working graduates surveys and concludes with some observations relating to the use of graduate profiles and the need the update and maintains these profiles as the needs of industry change.

2. SUPPORT FOR THE USE OF LEARNING OUTCOMES

Learning outcomes are explicit statements of what students need to know, understand, or be able to do as a result of completing educational courses (Hounsell, 1999). Learning outcomes are not content-based course descriptions, but they can include discipline-based outcomes. These might cover factual subject knowledge, professional knowledge, and professional skills and abilities. Learning outcomes often include the development of graduate attributes.

Toohey (1999) argues that learning outcomes clarify educational purpose and can help when designing all other aspects of a program. In a constructively aligned course, learning outcomes provide a guide to appropriate learning and assessment activities. Learning outcomes also express educational purpose to students, allowing students to know what the course offers, and what is expected. Research suggests that students tend to learn what the outcomes point them towards.

Evidence collected from student course evaluations has shown that clear expectations are a vitally important part of an effective learning experience. Lack of clarity in this area is almost always associated with negative evaluations, learning difficulties, and poor student performance Ramsden (1992).

O'Banion (1997, p.47) suggests that "learning facilitators succeed only when improved and expanded learning can be documented for its learners". Learning outcomes at course, program, and institutional levels clarify for all stakeholders the knowledge, skills, and abilities a student must possess to successfully complete a course or program. Since employers of graduates are significant stakeholders, they should be involved in the identification of learning outcomes when a programme or course is developed and they should also be involved in the evaluation of graduates as a means of measuring that the outcomes have been achieved.

3. GRADUATE PROFILES

A survey of Institute of Technology web sites, suggested that while graduate profiles may exist they are not readily available in a format that prospective employers and prospective students can easily locate. In New Zealand you are more likely to find details of what you can expect from a degree graduate by searching a University site than you will from an Institute of Technology web site.

A survey of ITPs revealed that while almost all institutes have a degree graduate profile of some form, some have a generic profile that is applied to all degree qualifications and others have specific profiles which detail outcomes for each individual degree.

Evaluation of the generic profiles, suggests that while they differ in presentation style and wording there are common cores values that the profiles identify. These core values include:

- Communication skills (verbal, written, collaborative, negotiation)
- Knowledge of the business environment (business functions, ethics, professionalism)
- Cultural and bi-cultural awareness (Treaty of Wiatangi, globalism, multi-cultural awareness)
- Problem solving ability (analysis, evaluation, critical thinking)
- Information and computer literacy (review, research, word-processing, communication technologies)
- Personal skills (willingness to learn, organization and time management, independence, reflective ability)

An additional value that surfaced in some profiles related to the "work readiness" of graduates, this was more prevalent in ITP profiles than University profiles. The range of core generic skills identified support the findings of Clear (1998) and Billing, Nodder and Young (2002).

Table 1.1 Employer and graduate average survey scores

Profile attribute	Employers	Graduates
Communication skills	4.00	4.00
Knowledge of the business environment	3.25	3.20
Cultural and bi-cultural awareness	2.25	2.60
Problem solving ability	4.00	4.00
Information and computer literacy	4.75	4.60
Personal skills	3.75	4.70
Ability to acquire and apply knowledge in discipline area	3.75	4.60

Evaluation of the information technology degree academic profiles included most of the core generic values identified above, as well as a number of more technical attributes that reflect the nature of the degree programme and in some cases specialization area. These more technical attributes were more difficult summarise because of the range of statements, however the essence of most of the statements could be included within the following values:

- Ability to acquire and apply knowledge in discipline area
- Understanding and appreciation of current issues and debates in discipline area.

While the graduate profile for the Bachelor of Computing Systems at Eastern Institute of Technology (EIT) was worded differently, its essence is captured in the summarised values listed above. With that in mind a questionnaire based on these values was produce which asked employers and working graduates to rate how well they believed each of the values had been achieved while studying at EIT.

4. SURVEY FINDINGS

The survey was given to five employers and twelve graduates, responses were received from four employers and ten graduates. A summary of the responses is shown in table 1.

For the twelve graduates that have been employed by Sysdoc Group, employers suggested that graduates were strong in the areas of communication skills, problem solving, information and computer literacy, personal skills, and the ability to acquire and apply knowledge in discipline area. Graduates did not fare so well in the areas of knowledge of the business environment, cultural and bi-cultural awareness, understanding and appreciation of current issues and debates in discipline area. Sysdoc Group staff pointed out that the skills where graduates scored highly were the skills that are considered more important within the company, and that they recruited staff who exhibited strengths in these areas.

The employers pointed out that the Sysdoc environment does not really give graduates an opportunity to test cultural and bicultural skills. Employers also suggested that they found ITP graduates to be loyal and hard working and productive within a short period after commencing employment. One area which was not identifiable on the graduate profile, related to the ability of graduates to recognize when they were out of their depth and when they needed to ask for help. Employers suggested that graduates did not like to admit shortcomings and were often reluctant to ask for help.

All four employers supported the suggestion that industry should be consulted when graduate profiles for an educational programmes are being established and they all appreciate the opportunity to participate in the survey.

The ratings of working graduates were similar to the ratings provide by employers, with similar strengths and weaknesses. Overall graduates appeared more optimistic about how well they were able to perform compared to the graduate profile. Several graduates felt that their degree

education had done little to improve cultural and bi-cultural awareness, and several students expressed concern that their degree teaching did not specifically prepare them for the types of activities undertaken by Sysdoc employees.

5. CONCLUSIONS

While the research did not set out to compare the skills of students at ITPs and Universities, it was interesting to note that the ITP sector was more concerned about the issue of work readiness than the University sector. An informal survey among IT staff at ITPs and Universities suggests that ITP degrees have an emphasis on practical skills and preparing students for specific employment roles whereas universities degrees have a more academic emphasis.

The aim of this study was to identify if there were learning outcomes that were common to ITPs and research suggests that most institutes have similar graduate profiles. The survey of employers and graduate students suggested that most students performed well measured against the graduate profile. The responses of employers and graduates were similar. Areas of strength identified by both employers and graduates include communication skills, problem solving, information and computer literacy, personal skills, and the ability to acquire and apply knowledge in discipline area. The area of most concern is the development of an awareness of cultural and bi-cultural issues in the workplace.

Since the sample was small and only considered ITP graduates there is scope for a more detailed study over a wider range of employers and graduates, such a study could also compare the skills of ITP and university graduates. It would also be of interest to discover which of the attributes listed in a graduate profile were considered more important so that educational institutes could establish where they should concentrate their teaching activities.

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