*C*reating *I*ntriguing *S*ynergies with *C*ourse *O*fferings: Integrating industry qualifications - An ITP perspective

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Aligning tertiary institute courses and programmes with internationally recognised industry qualifications has been the subject of various publications (Atkins 2002, Gutierrez and Tawa, 2003) and has engendered much debate among academics for several years now; e.g. Strategic Industry Qualifications Forum: NACCQ 14th Annual Conference 2001 at EIT. This initiative is not unique to the Information and Communications Technology (ICT) sector. The Otago Polytechnic School of Adventure offers courses in Outdoor Leadership, Scuba Diving and White Water Rafting that incorporate internationally recognized, as well as New Zealand, industry certification.

The paper discusses a strategic move by Institutes of Technology and Polytechnics (ITPs) to integrate industry qualifications, specifically the Cisco Network Academy Programme (CNAP), into their existing programmes. It examines the challenges associated with meeting the requirements of ITP qualifications, such as those based on the New Zealand National Advisory Committee for Computing Qualifications (NACCQ) model, while maintaining compliance with the requirements of the industry qualifications. These challenges include aspects related to assessment, moderation, quality assurance, and to the resource constraints inherent within the ITP environment. The authors believe that there are many benefits to ITPs accruing from the successful implementation of industry-sponsored programmes, but also acknowledge that there are drawbacks. They believe however, that benefits significantly outweigh drawbacks. They suggest that the addition of internationally recognized industry qualifications have provided an opportune mechanism for raising ITP profile with secondary schools and industry and further, they enhance graduate employability.

1. INTRODUCTION:

> *"The (sic) industry certification provides students with a more valuable qualification, which provides them with more choice and power in the job market"* (Atkins, 2002).

The IT industry makes it very clear in advertising job vacancies that their preference is for industry certified applicants in addition to the traditional Diploma and Degree qualifications. Microsoft Certified Professional (MCP) and CompTIA A+ feature strongly in advertisements, especially in the area of technical support, across a range of media, including daily newspapers (NZ Herald, 2004) and Internet job sites (Seek IT, 2004). This preference has been confirmed by the regional Local Advisory Committee (LAC) industry representatives and on a national basis through the NACCQ industry representatives.

Some ITPs have been slow to grasp this demand and have, as a consequence, lost potential students to the Private Training Providers (PTEs). However, a number of ITPs throughout New Zealand have recognized a distinct advantage in positioning themselves to offer industry certified qualifications, including EIT (Napier), UCOL (Palmerston North), MIT (Manukau) and CPIT (Christchurch). The distinct advantage lies in their ability to incorporate these industry certified qualifications into their traditional Diploma and Degree qualifications, which are still essential for today's IT graduates who seek employment in the industry.

Industry qualifications, such as those offered under the umbrella of CNAP, provide potential employers with an internationally benchmarked qualification. This is in contrast to possible variations in standards within the tradition Diplomas and Degrees obtained from tertiary institutions, both nationally and internationally, and from the New Zealand Qualifications Authority (NZQA) unit standards-based Diplomas available from the PTEs. The emphasis on the practical components of industry qualifications broadens student CVs making them more employable in an environment where 'on-the-job'

training is in decline, but potential employees are expected to have "Industry Experience".

2. INTEGRATING THE CISCO NETWORKING ACADEMY PROGRAMME – CASE STUDY

In 2001 the Waikato Institute of Technology (Wintec) department of Information Technology (IT) made a commitment to embrace CNAP and to integrate the Cisco Certified Network Associate (CCNA) programme into its NACCQ-based diploma qualifications.

The purpose of introducing the four module CCNA programme into the IT department's programmes was threefold:

- To provide "added value" to the programmes currently offered, thereby addressing in part, an oft-heard comment that "the Polytechnic courses are out of touch with industry requirements".
- To establish relationships with the secondary schools in the Wintec catchment area at a time when many disparate voices clamour for the attention of the traditional pool of potential students, not least PTEs.
- To establish relationships with the IT industry and its individuals by providing training for international industry certification.

The provision of training for industry certification by Wintec and other ITPs in conjunction with Diploma and undergraduate courses is in accordance with the ITP philosophy of producing "work ready" graduates. It also reinforces the ITP policy of fostering links with industry by offering training either as part-time students in the full-time Diploma daytime classes or in public evening classes.

In addition, it was perceived that a new initiative to attract more students into the IT department was urgently needed. The NACCQ family of diploma qualifications arose out of a joint effort between the ICT industry and the Polytechnics in 1988, long before vendor-specific qualifications were introduced into the field of ICT. As time passed a number of industry standard qualifications were developed, some of which became "flavour of the month" and were often very vendor specific. Others, including CCNA, offered a very good general education in the subject area, in addition to their vendor specific material.

2.1 Training

In order to offer Industry training ITPs and other providers; e.g. Secondary Schools, must be certified by the owner of the qualification, Cisco in the case of CCNA. Cisco has a hierarchy of authorising institutions, which are commissioned to train instructors and to protect the quality of the product. Wintec opted to become certified at the Regional Academy (RA) level. RA Instructors are qualified to train student Instructors. Wintec is responsible for recruiting Local Academies (LAs) and for managing quality control of the product at the delivery points. To provide student training Wintec has also established itself as an LA, has recruited several Local High Schools as LAs and has provided LA (student) Instructor training.

2.2 Financial Resources

Committing to offering the CCNA programme can involve a large investment in physical resources. This includes an initial outlay of approximately $30,000 for Cisco routers and switches and for purpose built data communications and networking labs (an additional cost of approximately $20,000), which must be networked and connected to the Internet independent of the ITP campus network (Gutierrez and Tawa, 2003). A further cost is associated with instructors who must successfully complete the CCNA exam and are then obliged to requalify every three years.

As Programmes evolve and mature there is an essential need to update the constituent modules to maintain currency, involving costs in the form of tutor training and resource acquisition. The established budget for this together with income from continuing education offerings has offset the setup costs of the initiative making the introduction of the CCNA modules into the Diplomas very economical.

2.3 Developing Local Modules

Incorporating the CCNA courses into the Wintec Diploma programme necessitated the development of new module prescriptions, which could be eventually offered to NACCQ for inclusion in the 2005 release of the New Zealand Qualifications in Information and Communications Technology (Blue Book) publication. Writing new curricula based on

the CCNA course material, although not difficult, is time consuming taking, about 8 to 12 hours per module requiring someone with a reasonable knowledge of the CCNA programme and experience in developing course curricula.

2.4 Quality Assurance

The Cisco assessment system (online chapter tests, online final test, practical labs and threaded case studies and flexibility to require students to achieve an 80% pass and 95% for merit) suits the NACCQ competency-based assessment model. The Cisco learning and assessment online environment suits the NACCQ RCAP model (Recall, Comprehension, Application and Problem Solving), which in turn is based on Bloom's Taxonomy of cognitive learning (Bloom, 1956). Although the online assessments are automatically marked and recorded on the Cisco web portal, a major advantage in terms of reducing tutor workload, they must also be recorded on the Wintec Management Information System, ARION.

The NACCQ Blue Book contains quality assurance regulations governing an external moderation process (Blue Book, 2002). Since the CCNA assessments are online the nominated NACCQ moderator of the CCNA-based Blue Book modules will need to be a CCNA-qualified instructor in order to access the online assessment material. Wintec also has an internal quality assurance policy governing student evaluation of tutors, modules and programmes (SETMAP), which complements the Blue Book process.

Compulsory student evaluation of all modules evaluated at CATC/RA level is an integral component of the assessment process and students cannot pass courses until the evaluation is complete. Cisco performs statistical comparisons of results for all offerings of each module in its CNAP on a Worldwide basis. The Cisco quality assurance process also involves regular collaborative visits from the Cisco Academy Training Centre (CATC)/RA responsible for supporting the Local Academies.

It is therefore apparent that there are no significant philosophical differences between the organisations.

2.4 TEACHING

The Cisco training programme promotes and encourages a mixed-mode method of delivery consisting of a combination of classroom instruction and on-line learning, as well as independent learning/ study and practical projects. Instructors are encouraged to explore different ways of presenting information in order to involve students in the learning process as much as possible. Cisco promulgates a number of learning strategies known as "best practices" in their Instructor training programmes, including:

- Challenges (the opposite of cookbook, or step-by-step, labs): Problem-based labs or projects that encourage students to work independently to develop solutions to various problems.
- Design activities: An iterative process that starts with brainstorming, proceeds through research and problem-solving matrices, design specification tests, and multiple repetitions of this process until an adequate solution to a problem is achieved
- Kinaesthetic Activities: Utilisation of students to act out or to communicate; e.g. a networking process. These exercises may also be known as role-playing activities or skits. They are designed to help make complex, normally invisible processes more understandable and fun for students

2.5 Marketing

Wintec's market share of the available secondary school graduate pool has been seriously eroded by the governmental decision to open tertiary education to competition from private enterprise. At a time when the "knowledge economy" is being touted on a national basis Wintec's IT enrolments have been falling, although they now appear to be recovering. The Wintec strategy is to establish at the "feeder level" ongoing relationships with students before they graduate secondary school, creating a more transparent pathway into IT at a tertiary establishment. Wintec has positioned itself to offer access to training resources not affordable to schools. The utilization of these resources requires visits to the Wintec campus and adds further depth to the establishing relationship that may culminate in students choosing Wintec as their tertiary provider.

Marketing involves a three-tiered strategy:

- Establish relationships with regional secondary schools, particularly the teachers of IT, with the view to the schools becoming Cisco LA's.
- Establish relationships with industry, offering the corporate establishment readily accessible training.
- Direct advertising toward the general public who are involved in the IT fields of industry.

Anecdotal evidence suggests that Wintec IT graduates have paid several thousands of dollars for PTE industry qualification training when Wintec has the capability to incorporate that training into Diploma programmes, or to offer it as "Continuing Education" courses at a fraction of that cost.

2.6 Administration

There is an administration overhead inherent in CNAP. A working allowance of one day per week for an Administrator is the minimum requirement for an RA. As the RA increases the number of LA's for which it is responsible, this allowance needs to increase, the cost of which must be offset against increased enrolments.

Wintec has developed a business plan, which indicates that after three years of offering CNAP, the initiative will contribute an acceptable rate of return to the institution.

3. CONCLUSION

The authors acknowledge that there are drawbacks to such an initiative. Relatively high set-up costs and the significant exposure inherent in reliance on an external body over which the ITPs have no control, is of concern. The strict requirement for students to pass a module before progression may delay their progress and external accountability, requiring Instructors to maintain currency, both onerous, are not unreasonable challenges. Ultimately they enhance the quality of our product. These drawbacks can all be minimised with a little lateral thinking.

The benefits accruing from student perception that Wintec offers up-to-date curricula and the concurrent acquisition of both traditional Diploma and Industry qualifications are immense. The knowledge that Tutors are industry qualified in current technologies enhances that perception and also elevates the Institution's credibility with Industry. This creates stronger mutually beneficial relationships, one industry employer having committed 12 employees to the CCNA program in 2003, all of whom subsequently succeeded in the CCNA external examination. Additionally, the Wintec profile amongst secondary schools continues to grow as the initiative matures.

In conclusion, the authors maintain that the benefits of Wintec embracing the opportunity to offer CNAP outweigh the perceived drawbacks. As a result, Wintec recently sent two of its academic staff members for training in the Cisco IT Essentials 1 course, which incorporates the CompTIA A+ material, with a view to offering it in 2005. Further, the Wintec Bachelor of Information Technology programme, under review for 2004, is considering incorporating CNAP.

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