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# INDIGENOUS PARTICIPATION *in* INFORMATION TECHNOLOGY PROJECT: ACHIEVEMENTS *and* CHALLENGES *of the* FIRST THREE YEARS

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## ■ Abstract

In 2002 the Faculty of Information Technology at the University of Technology Sydney began a major initiative to improve the participation of Indigenous Australians in the Information Technology (IT) sector. This followed an initial study which showed that very few Indigenous students undertook studies in IT at university and therefore few found employment as IT professionals. As a result of the new programme, the Faculty's first Indigenous staff were hired, an Indigenous resource centre was established and the first postgraduate students recruited. In addition, an IT tertiary preparation short course, the Indigenous Pre-IT Program, was launched successfully, the Faculty's first Indigenous-specific course. With the project, Indigenous student enrolments have increased, mainly as part of the Pre-IT Program and as a result of recruitment of undergraduates from amongst successful Pre-IT Program students. However, retention of undergraduates recruited via special admission provisions has proved difficult despite attempts to secure scholarships and to provide academic support. This paper traces the development of the project and analyses the achievements and challenges in the first three years.

## ■ Introduction

In September 2002 the Faculty of Information Technology at the University of Technology Sydney (UTS) began a three-year pilot project (subsequently extended) to increase the participation of Indigenous Australians in the Information Technology (IT) sector. This followed a study conducted the previous year which found that very few Indigenous Australians undertook studies in IT at university and therefore few found employment as IT professionals (Robertson et al., 2002a, p. 288). UTS already had a number of well-established and successful Indigenous programmes in education, law, nursing and community management, and it was considered time to extend this provision to include IT. This reflected the university's determination to expand Indigenous access across all academic disciplines and encourage Indigenous participation in the full range of professional education available to other Australians as part of a commitment to practical reconciliation (UTS, 1999).

There is a growing awareness amongst Indigenous Australians of the benefits of IT for their people and the need for trained Indigenous IT professionals. Many communities are interested in e-commerce for the sale of art and crafts and the promotion of cultural tourism, but websites installed by non-Indigenous developers often ignore cultural issues that are important to the community (Radoll, 2002, p. 29). IT has the potential to overcome the disadvantage of geographic isolation for many remote communities but locally-based Indigenous computer maintenance personnel are essential, given the problems currently experienced in accessing help from outside (Dyson, 2005, pp. 608-610). Furthermore, there are many applications of IT that address particular Indigenous concerns, such as Indigenous cultural archives, language revitalisation using website technology and CD-ROMs, Indigenous genealogy systems, sacred site management systems, and geographic information systems for establishing native title (Dyson et al., 2007). These all need the informed input and active participation of Indigenous people knowledgeable about IT (Robertson et al., 2002a, p. 288).

With this increasing awareness of the potential of IT, a number of IT programmes have been established for Indigenous Australians. Coincidentally, a month before UTS began its initial study, the Federal Government in conjunction with the Australian Information Industry Association (AIIA) announced their own initiative to open up employment in IT to Indigenous Australians, the Digital Divide Project (Hedley, 2001). In March 2002, young people on an overseas exchange programme tutoring at UTS and working at other organisations in Sydney began a project to provide Indigenous children with IT and other skills, Redfern Kids Connect (Solomon et al., 2003). In Brisbane, the Positive Links between Universities and Schools (PLUS) Project launched a programme to develop technological literacy and encourage familiarity with the university setting for Indigenous school students (Doherty, 2002). At Charles Sturt University, the School of IT has been developing a CD-ROM to promote IT as a study and career choice for Indigenous people (Moffat, n.d.). The Indigenous Participation in Information Technology (IPIT) Project is therefore not an isolated case although it appears to be the most ambitious scheme in Australia focused at the university level.

This article traces the development of the IPIT Project over its first three years of operation. We describe the achievements so far, as well as the challenges, in opening up university studies in IT to Indigenous Australians. It is believed that this history of a project to enhance Indigenous educational opportunities and Indigenous professional employment in the IT sector will be of interest to those working in the field of Indigenous education and to IT educators. It is hoped that it will inspire other IT educational providers to encourage Indigenous Australians into courses and that it will offer some insights on how this might best be achieved. The first part of the article provides a literature review of the situation regarding Indigenous participation in IT studies and the factors which contribute to academic success or failure. Following this a report of the first three years of the IPIT Project is presented. We provide a history of what has been done in the project and the major milestones since its implementation. We sum up the achievements of the project to date, and we analyse some of the issues which still need to be resolved if we are to be effective in providing IT education to Indigenous Australians and increase the number of Indigenous IT professionals.

### Indigenous Australians and information technology studies

In contrast to the successes in education, law, nursing and medicine, Indigenous achievements in technology-based disciplines have improved very little over the last three decades. Here we will examine the situation across the tertiary sector, both at university and in vocational education and training (VET).

### *Enrolments in IT courses*

IT is one area of university that attracts few enrolments of Indigenous students. Of a total 8,000 Indigenous Australians studying at university in 2001, only 107 were in IT (Ruddock, 2001). Statistics obtained by UTS from the Department of Education, Science and Training (DEST) during the initial study which preceded the IPIT Project showed Indigenous enrolments in university IT subjects almost tripling since 1989 to 125 students in the year 2000 (Robertson et al., 2002b, p. 26). The increase was at the undergraduate level since postgraduate enrolments remained fairly static. Moreover, according to the DEST statistics, a total of 32 students had been enrolled in IT subjects at UTS since 1989, with a maximum of six students in any one year.

If we are interested in the number of Indigenous Australians pursuing IT or computer science degrees, these figures do not give a clear indication because of the focus on IT subjects, at least in the DEST statistics. The numbers reported would certainly include students coming from other faculties to undertake single subjects in faculties of IT and computer science. They might also include enrolments in computing subjects in other degree programmes, for example, in education. Certainly no academics within the Faculty of IT at UTS could remember any Indigenous Australian students prior to the first undergraduate enrolled in 1998. Given the experience at UTS, it is believed that the number of Indigenous Australians enrolled in IT degrees at Australian universities prior to the commencement of the IPIT Project was very low.

Enrolment statistics for VET IT programmes offered by Technical and Further Education (TAFE) colleges, the Adult Education and Vocational Training Institute (AEVTI) which operates in gaols, and some high schools give a clearer picture of Indigenous enrolments in IT courses. In 2001, there were 2,930 Indigenous students enrolled in IT, representing a 79% increase for the five-year period 1997–2001 (Saunders et al., 2003, pp. 28–29). Of these, only 100 were enrolled in 2001 at the diploma level and 150 at Certificate IV level: these higher levels are of the greatest significance since it is here that students move away from learning how to use basic office applications and progress into professional IT studies which open the way to IT jobs. From 1997 to 2001 there was only an 11% increase in Indigenous students studying diplomas in IT but a 114% increase in students undertaking Certificate IV. Thus there has been an increase over recent years, although this is more obvious at the lower levels. Like university enrolments, the VET figures for Indigenous people are less than would be expected on a population basis: in 2001 Indigenous enrolments in IT diplomas were well under a third of that for non-Indigenous Australians proportionately, and for Certificate IV they were about a half (calculated from Saunders et al., 2003, pp. 9, 29).

There appear to be a number of factors contributing to the low Indigenous enrolments in IT programmes:

#### Lack of awareness

- The overriding issue identified in the initial research was that awareness of IT as a possible career or study choice is very low: "employment in the ICT industry, and preparation for it by studying IT courses, was rarely even visible as an option for Indigenous people" (Robertson et al., 2002a, p. 291).
- There are few existing Indigenous IT professionals to act as role models for young Indigenous people and most of those already in IT have got there by means other than university or TAFE courses, such as through on-the-job training, via design backgrounds or through industry certification programmes (Robertson et al., 2002a, p. 291).
- IT is often not included as a career option by school counsellors and teachers because they have little understanding of the profession (Robertson et al., 2002a, p. 291).
- Confidence in pursuing IT studies may be undermined by low rates of Indigenous computer ownership, low internet access and lack of computer skills (ABS, 2001; Barlow & de Lacey, 1998; Barraket et al., 2000, pp. 66, 71, 80).
- A further, somewhat paradoxical, factor in students' not choosing IT may be Indigenous success in the established areas of teaching, health and law: the filtering of Indigenous students directly into those disciplines may be so strong that other options are not being considered (Robertson et al., 2002a, p. 291).

#### Financial concerns

- Finances also have a marked effect on Indigenous university IT enrolments because Indigenous Australians are one of the poorest groups in Australian society and Higher Education Contribution Scheme (HECS) payments for undergraduate IT courses are set by the Federal Government at the highest level. Moreover, full fees are charged for all postgraduate courses in IT. In 1999, Indigenous university enrolments overall fell on a population basis for the first time after nearly a decade of steady growth; and since 2000 the gap between university participation rates of non-Indigenous Australians has widened (Wright, 2005, p. 16; DETYA, 2001). The decline from 2000 coincided with changes in the criteria for Aboriginal Study Grants (ABSTUDY). A major disincentive that is believed to have contributed to the 1999 slump is the increasing HECS payments.

#### Completion rates in IT courses

Exacerbating the problem of low IT enrolments is an even lower completion rate. The DEST statistics quoted earlier show that the absolute number of university IT subject completions was static (Robertson et al., 2002b, p. 26). However, relative to enrolments, completions actually halved from about 15% in 1989 to 7% in 1999 (completion figures for 2000 were not available at the time the statistics were obtained from DEST). Undergraduate subject completion rates as a percentage of enrolments were usually much lower than for postgraduates, about one-third on average.

In the VET sector IT pass rates are much higher than university but have also declined overall from 65% in 1997 to 56% in 2001 (Saunders et al., 2003, p. 29). However, at the diploma level, the decline was only marginal and pass rates have remained about the same as those of non-Indigenous students. For Certificate IV there was actually a marginal improvement although the pass rate remains significantly down from that for non-Indigenous students (66% compared to 75%).

Factors identified in the literature as contributing to Indigenous completion rates include the following:

#### Counselling, social and cultural support

- All educational institutions that have succeeded in retaining significant numbers of Indigenous students have provided very high levels of counselling as well as social and cultural support, often through dedicated centres staffed by Indigenous personnel, located either centrally or embedded within faculties (Kutieleh et al., 2003, pp. 42-44). A TAFE report notes that there are major problems in serving Indigenous students in mainstream programmes from the central Indigenous centre, particularly where the number of students is small (Balatti et al., 2004, pp. 6, 28-29). This obviously has implications for an area like IT where student numbers are very small and likely to remain so for some time.

#### Financial support

- Money worries and work commitments were found to be of the greatest concern in a study of Indigenous students' perceptions of factors influencing decisions to withdraw or continue with university study (Kutieleh et al., 2003, p. 43). Scholarships and cadetships are therefore of the utmost importance, but also financial counselling is needed (Foley, 1996, p. 54).

## Academic support

- The lack of prerequisite academic skills has been identified as a key factor affecting the performance of Indigenous Australians in higher education (Bourke et al., 1996, p. 4). A major cause for this is the tendency for Indigenous students to quit school as soon as they reach the age when compulsory attendance ceases (SCRGSP, 2003, p. 3.8). Academic support programmes that have been at least partially successful include the Federal Government's Indigenous Tutorial Assistance Scheme (ITAS) which provides up to three hours per week of individual tutoring; various tertiary preparation (bridging) courses, either general or (probably more successful) discipline-specific; and supplementary programmes in academic literacy and numeracy, usually taken concurrently with first year studies (Robertson et al., 2002a, pp. 291-292). In general, academic support has been shown to be more effective if delivered in the context of the discipline, and flexibility of progression is also important, with reduced subject load a desirable option (Farrington et al., quoted in Balatti et al., 2004, p. 20).

## The cultural appropriateness of higher education

- A major government report found that many Indigenous university students feel a loss of cultural identity and also experience alienation, discomfort and resentment at being expected to conform (Bourke et al., 1996, p. 31). This results from ignoring Indigenous culture and perspectives as well as from a disjunction between the teaching and learning methods typically practised at university and Indigenous Australian ways of learning, which apply to students from both urban and traditional backgrounds (Hughes et al., 2004, pp. 229-233, 251). In addition, there is a profound difference in Indigenous and mainstream knowledge paradigms, and in how knowledge is conceived, passed on to others and written about (P. Walker, 2000). Though many see assimilation as a thing of the past it still informs much current university education (McConaghy, 2000, p. 151).

### ■ Indigenous Participation in IT (IPIT) Project

Following the publication of the initial study in 2002, a three-year pilot programme was approved by the Dean of the Faculty of IT in July 2002, to be conducted by the Faculty with the support of Jumbunna Indigenous House of Learning, the Indigenous centre at UTS. The major milestones of the project to date are detailed in Table 1. Known as the Indigenous Participation in Information Technology (IPIT) Project, it sought to raise the number of Indigenous students studying and

subsequently working in IT by addressing the findings of the research study. The IPIT Project was born out of the University's strong commitment to reconciliation, with Indigenous and non-Indigenous staff working side-by-side in order to achieve practical outcomes for Indigenous Australians (UTS, 1999; Robertson et al., 2002a, p. 288).

Two main challenges emerged from the initial study and formed the focus of how the IPIT Project was to be pursued:

- Increasing the awareness of IT as a possible study and career option and so attracting Indigenous Australians into IT programmes, either at UTS or elsewhere.
- Retaining Indigenous students once they have enrolled in the Faculty's IT programmes; that is, providing support for them academically, culturally and financially so that they complete their programmes of study successfully.

### *Raising awareness and increasing enrolments*

A number of strategies were employed to increase awareness of IT amongst Indigenous Australians. Information regarding the success of different recruitment methods is known either by speaking informally to the undergraduates and postgraduates, or from surveys completed by tertiary preparation students. Those that were successful in recruiting at least one student into an IT course are listed here. Meetings and discussions with Indigenous units in other faculties at UTS were held. Schools with significant Indigenous enrolments were visited and Aboriginal officers at TAFE and Aboriginal medical centres were telephoned. The Eora Centre of TAFE and Tranby Aboriginal College, both of which provide tertiary preparation and other courses for Indigenous people, were visited and a prospective student and senior members from the Eora Centre toured the Faculty. A website for the project was launched. A tertiary preparation course in IT, the "Pre-IT", was developed and used as a vehicle for recruitment. Advertisements in the *Koori Mail* newspaper in turn helped recruit students for the Pre-IT and gave the project a national profile. In addition, an educational consultant was hired to design new marketing brochures to appeal to young Indigenous Australians and these were distributed at careers fairs. The impact of these brochures on recruitment, however, is not known.

### *Improving retention and completion rates*

To provide proper support for the students within an IT context and help them complete their courses, a small Indigenous resource centre was established within the Faculty. Two Indigenous staff members were employed, a part-time Project Manager and a full-time academic:

these positions are both currently filled by university-qualified IT professionals with industry experience, Ray Leslie and Stephen Grant. Given the failure of many educational initiatives designed for Indigenous people rather than by them, the participation of Indigenous staff in directing and implementing the project was viewed to be of utmost importance (Robertson et al., 2002a, p. 288). To provide support for the Indigenous staff, a structure was put in place consisting of a patrons committee of eminent Australians, a steering committee of senior Faculty and Jumbunna academics and a working group of volunteers from the Faculty. From the

latter, three subgroups were formed to address specific areas of the project, such as funding for scholarships and cadetships, student recruitment and support, and the development of Indigenous-specific courses.

#### ■ Achievements of the project

##### *Increase in Indigenous enrolments*

An obvious change in the Faculty has been the increased enrolments of Indigenous students. Enrolments and

Table 1. Milestones of the Indigenous Participation in IT (IPIT) Project and the study which preceded it.

October 2001	Research study commences
March 2002	First Indigenous IT postgraduate student commences; total Indigenous enrolments increase from 2 to 4 students
April 2002	Research report completed
May 2002	First Indigenous IT student graduates from UTS
July 2002	Indigenous Participation in IT (IPIT) Project approved by the Dean
September 2002	Indigenous staff join the Faculty; the Working Group meets for the first time
December 2002	Assessment procedures for Indigenous special entry updated
February 2003	Australian Computer Society (ACS) grants membership to all Indigenous IT students at UTS
March 2003	Postgraduate student enrolments double from 1 to 2 students; lectures are given by an Indigenous academic, Stephen Grant, for the first time in the Faculty's history
May 2003	Indigenous resource centre opens
July 2003	Official launch of the IPIT Project; IPIT website launched
August 2003	Indigenous IT marketing brochures produced
September 2003	The IPIT Project wins the UTS Equity, Social Justice and Human Rights (Reconciliation) Award
January 2004	Pilot 2-week Pre-IT Course runs successfully
April 2004	Unisys Australia grants money for first Indigenous IT scholarships
June 2004	Second Indigenous Australian IT undergraduate completes degree at UTS; proposal by IPIT researchers for the first book on Indigenous People and IT approved by an international publisher
August 2004	Intensive, Faculty-based academic support programme launched for Indigenous first-year students
September 2004	First IPIT Project Manager who has a degree in IT, Ray Leslie, commences
December 2004	One of the first-year students admitted under the IPIT Project and receiving academic support passes all subjects for the first time
January 2005	3-week Pre-IT Course cancelled because of lack of enrolments
February 2005	IPIT researchers invited by UNESCO to evaluate an international Indigenous information and communication technology programme, the ICT For Intercultural Dialogue Project
March 2005	First Indigenous student commences industry-sponsored Bachelor of Information Technology course and is awarded ACS-Unisys scholarship
July 2005	2-week Pre-IT Course runs successfully for second time
August 2005	3 students gain entry to the undergraduate programme directly from the Pre-IT for the first time

completions for the last six years are given in Table 2. These figures are estimates only, gathered from Faculty records and from Indigenous staff members in contact with Indigenous students. Because some students may choose not to openly identify as Indigenous, these figures may be an underestimation. Student enrolments have grown from one or two students annually before the initial research study began (typical enrolments for IT programmes at UTS) to eight students undertaking degrees in 2005, in addition to the 14 students who enrolled in the non-award Pre-IT Program. The current Project Manager, Ray Leslie, has been particularly effective in increasing undergraduate enrolments to their current levels by achieving a flow-on from the Pre-IT. These figures demonstrate that the project is achieving its first objective of increasing awareness of IT and attracting students into IT programmes: the new enrolments in the Pre-IT are the clearest indication of this, as are the three students recruited into the undergraduate course subsequent to their completion of the Pre-IT. Other increases are difficult to interpret and may be the result of the project, or may be because of a growing interest in IT generally in the community. For example, in 2005 the Faculty recruited the first Indigenous student into its prestigious and highly competitive industry-sponsored Bachelor of Information Technology programme (*National Indigenous Times*, 31 March 2005, p. 9). This enrolment was probably independent of the IPIT Project.

#### *The first postgraduate students*

Prior to 2002 it is thought that there were no Indigenous postgraduate students undertaking IT at UTS. Since 2002 the Faculty has had two students enrol in Masters degree programmes, one by coursework, and the other by research, representing our first Indigenous research

student. The Masters by coursework student is known to have been recruited directly as a result of the IPIT Project.

#### *The Pre-IT: The Faculty's first dedicated Indigenous course*

In March 2002 the development of the Faculty's first dedicated Indigenous course was begun, the Indigenous Pre-IT Program. This was launched in January 2003. The Pre-IT is modelled on successful, discipline-specific, intensive Indigenous tertiary preparation courses run by other institutions, such as the Pre-Law at the University of New South Wales. Its aims are to provide students with the chance to undertake some IT study and decide if they are interested in pursuing professional courses and a career in the field (an opportunity to "taste and see"). The subjects include Computer Fundamentals, Web Design, Internetworking, Introduction to Programming, and Information Systems Development. It is project-based, with students designing and building a website in small groups, and this approach fits well with Indigenous ways of learning (Seeman & Talbot, 1995, p. 771). It is the first IT course of its kind in Australia, introducing the students to professional IT studies and going far beyond basic computer literacy.

The main objective of the course was to attract students into IT. From the two Pre-IT courses that have been run to date, three students have commenced their undergraduate IT studies at UTS, one student completed the Microsoft Systems Engineer Certification and a TAFE diploma in IT, two students enrolled in a TAFE web design course, and two students jointly opened an internet café. Students from the first Pre-IT spoke highly of the course when asked to provide testimonials. For example, one student wrote: "This

Table 2. Estimated enrolments and completions of Indigenous students in IT programmes at UTS 2000–2005 (Note: Enrolments include newly enrolling as well as re-enrolling students).

Year	Indigenous enrolments				Indigenous completions			
	Undergraduate	Postgraduate	Pre-IT	Total enrolments	Undergraduate	Postgraduate	Pre-IT	Total completions
2000	1	0	-	1	0	0	-	0
2001	2	0	-	2	1	0	-	1
2002	3	1	-	4	0	0	-	0
2003	3	2	-	5	0	0	-	0
2004	3	1	11	15	1	0	10	11
2005	7	1	14	22	0	0	11	11
Total Completions:					2	0	21	23

course provided me with an insight into the various areas of IT that would have otherwise not been available to me. It has really opened my eyes and has encouraged me to further my education. University was not an option for me, or so I thought, but now I am very keen to pursue a course at university, thanks to this great course and the IT Faculty who provided excellent course content, patience and support" (Lively, 2004). Another student wrote: "I believe this is a great bridging course for Indigenous people for further studies in IT. I fully recommend it to any Indigenous person interested in the IT sector as a career choice" (Mallie, 2004).

#### *The provision of cultural and social support*

The founding of the Indigenous resource centre and its staffing by Indigenous IT professionals has provided for the first time a culturally supportive environment for students within the Faculty. Indigenous staff have been able to intercede on the students' behalf with lecturers and also provide a role model for the Indigenous students to emulate: "their own example in the struggle" (Freire, 1970, p. 39).

#### *Towards a truly Australian Faculty of IT*

Since the project began there has been a small but perceptible shift in the culture of the Faculty. For the first time the Faculty now includes two Indigenous Australians with whom non-Indigenous staff work and socialise, gaining something new from contact with a worldview different from the mainstream. At the official project launch, some staff tasted Aboriginal foods for the first time in their lives. Importantly, too, there have been small changes in the curriculum. Stephen Grant, as an Indigenous academic, lectures on computer ethics from an Indigenous Australian perspective in a core undergraduate subject. Inspired by the project, some other academics have begun including Indigenous themes into their assignments in subjects as diverse as Information Systems Foundations and Distributed Software Programming. This is important in responding to our Indigenous students' need for an education in which they feel included. Reforming the curriculum totally, though, is a much greater challenge given that the Faculty has a culture of its own which it may be unwilling to change for the small minority of Indigenous students.

#### ■ Issues still to be resolved

There are several issues that have appeared in the first three years of the IPIT Project that still need much more work and thought. For the most part these centre on the vexed issue of poor completions which bedevils Indigenous education generally.

#### *Static completions and poor undergraduate pass rates*

Course completions for the last six years are shown in Table 2. Apart from two students recruited before the project began and apart from the highly successful Pre-IT, there have been no completions during this period. Most of our new undergraduates are experiencing difficulties in passing all their subjects and some are dropping out following repeated failures or due to financial pressures. The expected standard of academic performance in all the Faculty's degree programmes is high, pitched to students who receive good marks as school leavers and who are often highly competitive, vying with each other for top grades each semester. In contrast, most of the new Indigenous undergraduates have been recruited under special admission procedures – they are assessed as having the potential to complete university courses successfully based on literacy, numeracy and computer literacy tests. However, most come from a background of poor schooling and poverty, and most have not completed the final years of high school.

#### *Better and more timely academic support*

To address the issue of undergraduate pass rates, there needs to be improved academic support for the Indigenous students during their first year of study as well as more timely delivery of support. Through the project's three years the Faculty, in conjunction with Jumbunna Indigenous House of Learning, has experimented with a number of different support regimes. Two options that have been tried unsuccessfully are tutorial support under the Federal Government's ITAS scheme and a general Supplementary Course for Aboriginal and Torres Strait Islanders Scheme (SCATS) to improve academic literacy, run by Jumbunna for all Indigenous students at UTS. Finally, a Faculty-based system was developed in 2004 consisting of learning contracts, a case manager, tutors allocated for each subject, reduced subject load and a Faculty-specific academic literacy subject provided by the English Language Study Skills Assistance (ELSSA) Centre at UTS. This last system, embedded within the Faculty and delivered largely by IT tutors with an understanding of the discipline has proved successful with some students. Issues still exist with implementing this quickly at the beginning of semester, obtaining funding to pay tutors in an environment of fiscal restraint and persuading poor students with study skills and time management problems that it is worthwhile.

#### *Financial support*

Scholarships or cadetships are needed by all the Indigenous degree students to allow them to direct their energies into their studies instead of working



to support themselves and pay their fees. Both UTS's first Indigenous IT graduate and the first Bachelor of Information Technology student have reported that the outcome of winning scholarships was that they could concentrate on their studies and give up their jobs (Foresheaw, 2005; Riley, 2002, p. 38). To date, Sydney Water, Unisys Corporation and the Australian Computer Society have been the only organisations to provide these. The downturn in the IT sector in Australia since 2001 has made it more difficult to attract corporate sponsorship.

### ■ Lessons from the project

#### *Enrolments*

The findings confirm what much of the literature on Indigenous Australian education states – that it is easier to increase Indigenous enrolments than it is to achieve increased course completions (Balatti et al., 2004, p. 6; Bourke et al., 1996, p. 4; DETYA, 1999, p. 3; Saunders et al., 2003, pp. 7-8; R. Walker, 2000). Even so, enrolments have only grown through a concerted effort: by setting up a special programme (the IPIT Project), by developing a special course (the Pre-IT), by establishing a web presence, by placing advertisements in Indigenous newspapers, and by ringing around, visiting colleges and schools, and following up any leads regarding potential students.

#### *Completions*

With respect to completions, the experience of the Project shows that:

- Good completion rates are achievable in courses designed specifically for Indigenous Australians, such as the Pre-IT. According to student focus group evaluations of the Pre-IT, its success derives from being taught at least in part by Indigenous teachers, from having an inspiring curriculum which goes beyond basic computer skills, from acting as an IT "taste-tester" which gives students the confidence to consider entering university, and from allowing students to study with other Indigenous learners in small classes. It is also believed by the course developers that the project-based design has contributed to the success of the Pre-IT in lending reality and focus to the curriculum, and this approach has been recommended by other Indigenous education providers in the past (Seeman & Talbot, 1995, p. 771). Other factors which may contribute to its success are the team-based approach to learning where stronger students help the weaker, the emphasis on active learning, the fee-free nature of the course, its delivery in block mode, and the fact that it is a short preparatory course which naturally

does not require the same amount of perseverance as completing a degree.

- Progression at the postgraduate level is possible if research students are permitted to complete in their own time with ongoing support from supervisors, allowing for the heavy, extra-curricular commitments that these older students typically have. For coursework students, high upfront course fees have proved a major disincentive, resulting in the one student in this category deferring enrolment.
- Pass rates and grades of undergraduates can be improved by removing financial worries through scholarships or cadetships (Foresheaw, 2005; Riley, 2002, p. 38). A total academic support programme based on a Faculty-embedded, or discipline-specific, case management approach for a minimum of the first year of their degree has also proved worthwhile for at least two students, as shown by clear improvements in their academic performance since this was implemented.

### ■ Essential components for success

The experience of the Project has shown that three essential ingredients are required for success in a new and difficult venture such as this:

1. Firstly, Indigenous staff are needed who are qualified in IT and so have an understanding of IT – they are needed to participate in the shaping and direction of the project and to act as role models for the students. Many of the Indigenous students have developed close relationships with the Indigenous staff which has made implementation of support possible. The staff's IT expertise has proved invaluable in delivering tutorial assistance to the students in their IT subjects, in delivering modules within the Pre-IT Program, in developing and delivering IT activities on student visits to the Faculty, and in researching IT issues surrounding Indigenous Australians.
2. The second requisite is sponsorship at the very highest level in order for continuing resources to be allocated to move the project forward, particularly in a climate of fiscal restraint. In the case of the IPIT Project this has come from the Dean of the Faculty and from the Head of Jumbunna Indigenous House of Learning, supported by a university which is committed to reconciliation through achieving real outcomes in Indigenous education.
3. The third essential component is the participation of non-Indigenous staff within the Faculty to provide extra hands where needed and to lend their range of skills to a complex and difficult project. The organisational structures of the project, such

as the working group, have enabled many members of the Faculty to contribute. The delivery of the Pre-IT each year, both its promotion and teaching, is the result of collaboration between Indigenous and non-Indigenous staff members.

## ■ Conclusion

Despite the increased availability of education to Indigenous Australians, participation in IT programmes is very low, as is the awareness of the career options available in the IT industry. The IPIT Project represents a serious attempt to address this situation. The project is one of the first endeavours in this country to open to Indigenous Australians an area of study that has not traditionally been associated with the immediate needs of their communities. Our challenge is to graduate a first generation of IT professionals just as the education and health faculties started to do some two decades ago, and law and business have done since. To date, the project has had its successes and its failures. The most serious shortcoming has been poor undergraduate pass rates and retention due to the highly disadvantaged backgrounds of many of our students. The problem has been exacerbated by the difficulty in finding scholarships and providing good academic support, but we are continuing to work steadily on these two issues, led by the Project Manager Ray Leslie and supported by academic Stephen Grant. By contrast, the success of our first Indigenous-specific course, the Pre-IT, the flow-on of students from the Pre-IT into the undergraduate programme, and small increases in Indigenous enrolments elsewhere lead us to believe that gradually the project is achieving some of its aims and that the goal of providing a path to IT for Indigenous Australians is realisable. Despite the challenges, we are convinced that now is the right time for the IPIT Project. In Indigenous thinking, an important concept is that of the right moment at which indicators support the taking of a particular action (P. Walker, 2000, p. 31). We believe now is the time for Indigenous Australians to move into IT, to take up employment as IT professionals and to enter positions of decision-making where they will be able to support their communities' aspirations for better access to IT and shape the design and delivery of technologies that have special relevance to them. Bree Riley, the first Indigenous graduate from the Faculty, summed up the possibilities for her people when she said, "Many in our community either don't see or understand IT as an option, but I know there's a lot of untapped potential out there. The course taught me that you've got to give it a go. IT offers an enormous world of opportunity" (cited in UTS, 2003). The Faculty of IT at UTS is making its contribution to ensure that Indigenous Australians have this new opportunity available to them.

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