



Equity in a digital world: engaging Indigenous learners

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This paper reports on an action research project investigating whether the integration of computer-based homework with face-to-face delivery can enhance learning opportunities for 36 Indigenous adult learners enrolled in Certificate III in Spoken and Written English at Batchelor Institute of Indigenous Tertiary Education in the Northern Territory. The impetus for the project was concern over learners' slow rate of progress through the course in the two years prior to the project.

Four action research cycles were conducted during the 2008 academic year to investigate student levels of participation in, and responses to, computer-based homework. The findings show that the use of computer technology enhances opportunities for homework participation; however, these opportunities are mitigated by factors linked to three thematic areas: access to computer technology; lifestyle factors; and attitudes towards learning and homework.

Keywords: Indigenous, action research, English language, literacy, technology, engagement, equity

Indigenous education

In Australia there is a substantial education gap between the Indigenous population and the wider Australian population (ABS, 2008). Only 36% of Indigenous Australian 17 year olds are reported to be attending secondary school as compared to 66% of non-Indigenous Australians of the same age. It is clear that the Australian education system has failed to adequately provide for Indigenous students, particularly in respect to fostering English language, literacy and numeracy outcomes, and this has a flow-on effect to success in post-school education and employment.

There are very high rates of participation in Vocational Education and Training (VET) from Indigenous students from remote areas across Australia; however, this level of participation ‘has not to date translated into improved labour force participation or well being’ (Young, Guenther & Boyle, 2007, p. 23), nor does it even equate to certificate completions (Young, Guenther & Boyle 2007:10). Only 25% of Indigenous people, as compared to 47% of the Australian population, have a non-school qualification (ABS, 2008). Indigenous participation in VET is clustered at Certificate I and II level pre-vocational courses (Anderson, Wallace, Christie & Kennedy, 2009, p. 4; Young, Guenther & Boyle, 2007, p. 10). While Certificate III is the level generally regarded in practical terms as an entry level vocational qualification (Stanwick, 2006), the prerequisite English language, literacy and numeracy skills for engaging in training at this level are higher than those possessed by many Indigenous adults in the Northern Territory (Kral & Schwab, 2003).

Against this background of inequitable educational outcomes, this paper reports on an action research project which focused on improving the engagement of and outcomes for a group of Indigenous adult students in the Northern Territory (NT). The impetus for the project described in this paper was concern over learners’ slow rate of progress through an English language and literacy course in the two years prior to the research. Historically, progress had been adversely affected by extended periods between intensive workshops when students were not involved in formal study, as well as by low and irregular levels of attendance. The students’ interest in using digital technologies in the classroom suggested the possibility of linking homework to computer-based activities which would provide opportunities for learning outside of the classroom. Rather than perpetuating a culture of blame for low attendance and slow progression, this research project sought to build an understanding of the barriers that were impeding students’ progress. It also sought to identify the factors contributing to positive outcomes, as well as to explore the role of computer and digital technologies in improving student engagement, progress and outcomes.

Context of the research

This research took place at Batchelor Institute of Indigenous Tertiary Education (BIITE), a dual sector (VET and Higher Education) educational provider located 100km south of Darwin in the NT. The participants in the research were a group of 36 Indigenous students enrolled in Certificate III in Spoken and Written English (CSWEIII). The group comprised of 30 female and 6 male students. The majority of the students, 31 in total lived in remote or very remote Indigenous communities and 34 of the students spoke an Australian Indigenous language as their first language. The students enrolled in the course to improve their English language and literacy skills as a pathway into, or concurrent with, VET courses or as a stepping stone into tertiary preparation courses and ultimately into higher education degrees.

Course delivery was conducted in the 2008 academic year over 13 weeks of intensive delivery in one or two week ‘workshops’. An additional 75 hours of individual study was built in to the course to allow students to complete the 400 nominal course hours in one academic year. Over the research period attendance at workshops ranged widely. Only two students attended all workshops delivered. 58% of students attended less than half of the workshop weeks and only 19% of students attended more than 80% of the workshops conducted. The implication for students of low attendance and low rates of participation in the components of home study was slow progression through the course.

Technology: a conduit for engagement and progression

In the two years prior to the research a range of digital technologies were used in activities to develop English language, literacy and digital literacy skills in the CSWEIII course. The students embraced the use of technology and were very interested in developing digital literacy skills to use in the learning environment as well as for work and social purposes. The digital tools used in the project were those which were available, reliable, effective and easy to use. The tools used in the classroom during workshops and subsequently for homework activities were also linked to skills that students indicated themselves that they wanted to develop.

As the learning environment was predominantly classroom-based, limited use was made of computer-based tools to present information, whereas a strong focus was placed on collaborative, interactive and co-creation tools such as discussion forums, wikis, and glossaries. Links to websites, audio and video files were also incorporated into the course through a Learner Management System (LMS), Moodle. Many of the audio and video files were developed by the students during class activities and were then used as the basis for additional learning activities in the LMS. A range of digital tools, such as Marvin animation software, were used during to develop student skills in using technology, to engage their interest, and to enhance opportunities for collaborative and communicative learning. Feedback indicated that the students enjoyed working with a range of computer-based and digital tools and activities, as well as with more traditional modes of delivery and types of activity.

Homework activity during the project included asynchronous activities through the LMS, as well as other activities including preparation for oral presentations, writing emails, and activities based around external websites. Synchronous activities were not conducted between workshops due to difficulties with computer access, technological support and logistical issues. Some tools that were used successfully in class (such as Marvin, and video-making) were not suitable for students to use between workshops as they required specialist software and hardware.

While the incorporation of technology into an educational program may appear to be routine, there are a range of socio-economic and geographic factors that impact on the participation of Indigenous people in technology driven educational delivery. In the NT, with a sparse population spread over a large geographic area, online education at first sight appears to be an attractive option for learners who may otherwise not have had the opportunity to gain formal educational qualifications without having to travel away from home or moving to another place to attend face-to-face classes (Kilpatrick & Bound, 2003, p. 7). However, nationally the level of internet access is much lower for Indigenous households (43%) when compared to that of non-Indigenous households (63%) (ABS, 2008a). This difference is exacerbated by the fact that for Indigenous Australians home internet access decreases significantly as remoteness increases, while in other sectors of the population there is minimal difference in the levels of internet access between major cities and very remote areas. The pattern of internet access has particular relevance to this project, given that 79% of the Northern Territory's Indigenous population live in Remote and Very Remote areas (ABS, 2008). Nationally only 8% of Indigenous people living in remote areas had home internet access at the time of the 2006 Census (ABS, 2008b).

Yet despite these issues, in Northern Australia Indigenous people use digital technologies, when they can access them, for a range of purposes. The interest exhibited by students in using technology in this project is consistent with the literature about Indigenous engagement with technology in Australia, and in particular in the context of remote communities in the NT. Indigenous people have for some

time embraced recording technologies, appropriating it for their own social and political purposes (Christie, 2005; Verran & Christie, 2007) and in particular for recording of ceremony. More recently, Kral has identified that for Indigenous youth, 'life is increasingly connected to mainstream practices, technology and a non-traditional lifestyle' (2010, p. 10). In particular, the use of digital technologies has provided young Aboriginal people who are 'seeking new ways of expressing a contemporary Indigenous identity' (Kral, 2010, p. 10) with the tools to mediate 'between old and new knowledge and new technologies to create new forms of cultural production' (Kral, 2010, p. 10).

The action research project discussed in this paper explored whether the students' observed enthusiasm for using computer technology could be harnessed to encourage participation in homework activities, and in so doing provide opportunities for students to practice and develop their English language and literacy skills in the periods between intensive workshop blocks. This was set against a backdrop where the digital divide was seen clearly to exist.

Action research

Description and rationale

Action research is 'a cyclical, dynamic, and collaborative process' (Stringer, 2004, p. 4) which combines 'joining of practical action with the pursuit of theoretical understanding' (McTaggart, 1991, p. 6). Action research is designed around cycles of planning, implementation, observation and reflection. The term action research was coined by German social theorist Kurt Lewin. Lewin was influenced by John Dewey's vision for reform of educational research in the early 1900's which included the political acts of 'demystification, domestication and democratization of the scientific method' (McTaggart, 1991, p. 2), as well as by the politics of the Second World War and the social changes occurring in the post-war era including the upheaval in race relations in the USA. The linking of theory and praxis provided the philosophical underpinnings of Kurt Lewin's vision for the re-conceptualisation of research to encompass 'the study...of the social processes which lead to committed social action' (McTaggart, 1991, p. 7).

Action research is an approach that is highly relevant in the field of educational research. It both complements and enhances the normal teaching activities of planning and implementing a teaching and learning sequence, observing the results and reflecting on what happens in order to commence a new revised cycle of planning and action. Action research is equally relevant as an ethical approach to conducting research in an Indigenous context in order to counter Indigenous disadvantage, contribute towards immediate improvements in people's lives, as well as providing a theoretical base for more wide-ranging social change. Nganampa Health Council in Central Australia, for example, actively promotes the incorporation of research with action in order to improve the lives of Aboriginal people with the philosophy: 'if you're conducting a survey of toilets, take a plumber with you to fix the broken ones' (Miller & Rainow, 1997, p. 96). Action research provides a practical and systematic approach to gaining insight and information that leads to solving practical problems or improving a situation, through building understanding and promoting change.

Data collection methods

In the project described in this paper, four cycles of action research were conducted. Within the cyclic process, multiple approaches were taken towards collecting data. These included a background survey, five reflective surveys, three focus groups, and a review of documents created by students as well as computer-generated reports on student access to the Learning Management System, and seven semi-structured interviews. The mixed methods approach to data collection allowed for triangulation of data and for comparison between what students said and what they did with respect to participation in homework activities. The collection of data was carried out and reviewed continuously over the duration of the research period and drove the direction of each of the four cycles of action.

The four cycles of action research

The first cycle of action research included the background survey, which was conducted to establish students' levels of access to internet-enabled computers and other digital technologies in their homes and communities, their attitudes to homework, and in particular to computer-based homework activities. Initial data was also obtained on homework participation and on the barriers students experienced in participating in homework, as well as factors that enabled their homework participation, through two reflective surveys.

The data obtained in each cycle of research guided the subsequent cycles. One of the early findings was that most students experienced some barriers to participating in computer-based homework when they were in their communities. Based on this feedback, the second cycle of research explored student participation in computer-based homework during a campus-based workshop and found that there were also barriers to homework participation when students were on campus, though for reasons different from when the students were in their communities. In both locations, there were similar levels of homework participation.

The third action research cycle was conducted over five months. During this period, homework participation was made an assessable component of the CSWEIII course. Despite the change of homework participation from optional to mandatory, and the students' greater confidence and skills in using computer technology at this stage of the project, monitoring attitudes and behaviours in the third action research cycle revealed that making homework assessable had little impact on homework participation levels for this student cohort.

The fourth action research cycle was one of consolidation, reflection on the teaching and learning that had occurred over the project, and planning for the future direction of the course after the completion of the project. The reflective survey conducted during the fourth cycle of action research found little new information, suggesting that data saturation had been reached. Semi-structured interviews were conducted with seven students during this research phase and these provided insight into students' social use of computer technology, as well as their reflections on and appraisal of the use of technology in classroom and homework activities over the research period.

The cyclical and participatory nature of this research included the students' active involvement in the research process. The students were not used to providing this level of input into the planning and evaluation of their own learning, but benefitted from it in a number of ways. Apart from the opportunity to explore the use of digital technology outside of the classroom, students were given the chance and the tools to become more reflective learners and their feedback during the research period, particularly in focus groups and in semi-structured interviews, indicated that they became more aware of and more in control of their own learning as a product of the research process.

The findings: Access, Lifestyle and Attitude

Through the cycles of action research a large volume of rich, descriptive data was produced. The data were analysed from a thematic perspective and from this analysis three themes emerged: access, lifestyle and attitude. The first two themes provide an understanding of the uneven nature of students' participation in computer-based homework while the third theme, 'attitude', was identified through a process of inductive reasoning and is a variable that explains why some students participated in the learning opportunities presented by computer-based homework, regardless of the limitations linked to access and lifestyle, while others did not.

Access

The first theme to emerge from the data relates to the broad area of 'access' to computers and the internet. This theme was a central concern for the Indigenous students who participated in the project. Despite the seemingly ubiquitous nature of information and communication technologies in the daily lives of most people in Australia, there is a gap between those who can access and apply those technologies and those who can not. This gap, or digital divide, threatens to 'exacerbate existing social and economic inequalities between countries and communities' (Australian Institute for Social Research, 2006, p. 4-5).

The digital divide clearly exists for the students who participated in this research and has four key components: lack of ownership of computers over which the students have discretionary use; limited access to computer and internet facilities in their communities; variable levels of communications service provision and infrastructure across remote communities; and lack of technical and academic support for computer-based learning outside of the formal teaching and learning environment.

The background survey identified that all of the participating students had access to a computer with internet connection in their home community. While none of the students said that they owned a computer or had one at home, computers were available at various locations in their communities, such as in the local council office, the workplace, a local library or a BIITE library or community study centre. Subsequently, in reflective surveys and focus groups, some students reported that, although there were computers in their communities that they had indicated that they could use, the reality was somewhat different.

The poor access to public-access computer facilities that was identified in this research has been noted in the literature (Papandrea & McCallum, 2006; Sawyer, 2004) as a factor limiting Indigenous use of the internet. A number of students initially stated that they could access a computer in their workplace to do homework; however, this did not eventuate in practice. While students were at work they were engaged in the duties associated with their employment, and after hours their office or workplace was locked and the computer inaccessible. Where community facilities did exist, they were not suitable for sustained periods of learning. The predominant use of public computers is for transactional purposes,

for internet banking, communication with friends and family and for leisure purposes. The location of community computer facilities in public spaces is a factor which limits the successful use of computers for study and education purposes due to the limited numbers of computers available, and time pressure on their use.

For extended study purposes students require access to computers for prolonged periods of time in an environment dedicated to learning. Community facilities are particularly important 'where private households are unlikely to pay for these services themselves. Remote Indigenous communities fall within this category. Residents have low incomes and low levels of education and technical expertise' (Daly, 2005, p. 8). However, this research found that in the communities where study centres were located, students reported that these were generally locked up unless a lecturer was visiting the community. Students indicated a high level of frustration at having such facilities in their communities going unused.

Improving telecommunications services to Indigenous communities is part of the response required. Both nationally and in the Northern Territory, improved internet service provision is being promoted as the panacea for remote access to digital technologies, for example, through the proposed rollout of the National Broadband Network. The issue of access as identified in this research is, however, far more complex and encompasses 'technological, educational, political, financial and social aspects, with each dimension in turn having a number of layers' (Candy, 2004, p. 63).

Given the difficulties students faced in accessing internet-enabled computers over the action research project, the homework participation rates of between 37% and 47%, for students attending workshops, were a significant achievement. They are also testament to the students' interest in using computers as a tool to enhance their learning opportunities although current levels of access to digital technologies deny to students the opportunity to fully participate in the knowledge economy. As Kofi Annan, the Secretary-General of the United Nations (1997 – 2006) noted, 'being able to access ICTs is a privilege enjoyed by a minority of the global population, but for those living in societies where opportunity depends on being able to bridge the digital divide, the deprivation compares to lack of food, shelter and basic survival sources' (ANTA, 2002, p. 8).

Lifestyle

Throughout the research period the students continually juggled competing 'lifestyle' demands, with the immediate needs of family, work and cultural demands generally taking precedence over homework. The theme of lifestyle thus emerged as a critical one in understanding the complex factors that influenced students' participation in homework tasks.

Throughout the research period, students stated that they wanted homework. Yet during the reflective surveys and focus group discussions students gave many reasons as to why they had done minimal homework. Across the four action research cycles, which reflected different models of homework, less than 50% of students attending workshops participated in homework activities. Furthermore, apart from the extended amounts of time spent on homework when there was in-community support by a lecturer, the time spent by students who did engage with homework was minimal. Reports of computer usage show that 62% of all incidences of computer-based homework were for periods of less than 10 minutes, with only 8% extending more than one hour. Students repeatedly said that they did not have time to do homework and it is clearly the case that, even when they did, it was for periods of time that precluded more than cursory engagement.

Many of the lifestyle factors that were found in this project to influence homework participation are similar to those that impact on course-completion in the VET sector as a whole (Department of Finance & Deregulation 2009, p. 65; Kirkby, 1999, p. 4; McMillan, Rothman & Werrert, 2005, p. 6), although cultural demands and factors such as poor health and household overcrowding are additional factors that complicate the lives of Indigenous students. Across the VET sector nationally, students report that employment demands reduce time available for study and increase job-related stress and tiredness (McMillan, Rothman & Werrert, 2005, p. 6). In addition, family and personal reasons also impact on course completion, particularly major life changes, domestic violence, the death of a family member, weddings, pregnancies, birth, marriage breakdown, moving house, accidents, major illness and custody battles.

The lifestyle issues impacting on Indigenous students' course attendance and homework participation, while similar in some respects to those of other VET students, are more extensive and exacerbated by cultural factors and factors associated with the low socio-economic status of Indigenous Australians. Lifestyle issues emerged in this project as a major theme, one of a complex web of factors impacting on the participating students' involvement in computer-based and non-computer-based homework.

Attitude

The identification of the third theme of 'attitude' is an attempt to conceptualise and articulate differences in the level of student participation in computer-based homework that can not be explained by the variables associated with access and lifestyle alone. The term 'attitude' covers the students' approaches to learning and to the use of computers and other digital technologies, their levels of intrinsic motivation, their sense of identity or view of themselves as learners, and the disparity between students' statements and their actions. Indeed, the theme of attitude is an attempt to explain students' behaviour with respect to homework participation after taking into account the variables of access and lifestyle.

In this project, students exhibited positive attitudes towards the value of homework as demonstrated by 91% and 100% of students who indicated in the second and fourth reflective surveys respectively that they wanted homework. However, with actioned homework levels consistently lower than 50% across the research period, there were inconsistencies between students' expressed intent and their actions.

The theories of Argyris and Schon (1974) provide an explanation of the complex relationship between espoused and enacted beliefs by explaining that individuals engage in both conscious and unconscious reasoning processes which are not necessarily aligned. While a person may assert a belief (espoused theory), such as the importance of doing homework, their actual world-view and values are implied by their behaviour (theory-in-use), for example by spending the weekend with friends and family and not doing homework. When there is a lack of alignment between a person's stated beliefs and their actions, Argyris and Schon suggest that the person may not be aware of their theory-in-use, the world-view implied by their behaviour. Conversely, an alignment between what a person says and does reflects congruence between their espoused theory and their theory-in-use (Anderson, 1997).

For a few students who participated regularly in homework, their espoused beliefs were reflected in their actions; however, for others a stated intention to do homework such as 'Yes, I absolutely want to study between workshop and I'm ready and sure to do it' (Reflective Survey 4 – Student 3), was not reflected in homework participation, suggesting a lack of awareness that the world-view and values implied by their behaviour were different to those on which they believed their behaviour was based (Anderson, 1997).

The distinction between espoused beliefs and actual behaviours can also be explained in terms of learners' multiple identities (Wallace, 2009). When learners have a strong sense of themselves as competent learners and when their identities and values as members of a family and community are recognised by the educational system, they are more likely to act in ways that support their learning. On the other hand, where a student's identity as a learner is not strong, and where that identity is in conflict with the values of their family, peer group and community, the student is less likely to persevere with education.

In the context of this research, the lack of participation in homework activities by some students could be partially explained by suggesting that they do not have a strong sense of themselves as learners, and that possibly the imposition of homework conflicts with the values of their families and communities and their own identities as community and family members. Wallace asserts that only when a learner's desire to achieve an educational goal, such as to get a qualification, can be articulated as a need, are students able to 'develop ways to reconcile their identities as learners' (Wallace, 2009, p. 43) with their identities in the community.

For many of the students who did engage in homework activities, personal traits such as a positive attitude, motivation and perseverance appeared to be enabling factors. For these students, homework participation was done against the odds, often despite problems in gaining access to a computer and the internet and managing the competing demands and responsibilities of their study, work, personal, family and community selves. As identified in this research, a student's stated desire to participate in computer-based homework does not necessarily translate into action; however, a positive attitude, which can be conceptualised as congruence between espoused theory theory-in-action or a strong learner identity, does appear to be a factor which influences participation in homework activities.

Recommendations and ideas for future research

The research described in this paper into the use of technology to provide learning opportunities outside of the classroom was based on a small-scale action research project with a group of Indigenous learners studying CSWEIII at BIITE. However, the findings from this project are likely to resonate with educators delivering other courses at BIITE as well as with educators from other educational institutions working with Indigenous learners. The observations from the project and the findings align and add value to the work of other researchers in the areas of Indigenous learning and literacy in the Northern Territory (Kral, 2010; McCrae-Williams, 2010; Nicholls, 2007; Nicholls, 2008; Wallace, 2009). Therefore, it is proposed that the themes that emerged from this research are likely to be relevant to other educational programs being delivered to Indigenous people in the Northern Territory as well as in other geographically remote locations in Australia.

The following recommendations are intended to assist in addressing the digital divide that exists between Indigenous and non-Indigenous Australians and enhance learning opportunities for Indigenous people.

1. Embed technology skills in vocational education and training, including in English language, literacy and numeracy courses for Indigenous learners to provide opportunities for IT skills development, an essential prerequisite for participation in the knowledge economy.
2. Provide Indigenous learners with a choice of delivery modes to access training. As online learning becomes more prevalent, online courses should be provided as an option and not as a substitute for face-to-face and mixed-mode delivery. There is clear evidence that Indigenous people still have problems accessing the technologies that are promoted as being the means of addressing the tyranny of distance and providing them with access to education and learning at a distance.
3. Increase scope of funding for communications technology in remote Indigenous communities. The Federal and Northern Territory Governments should ensure that, in addition to funding infrastructure costs and the one-off capital costs associated with purchase of digital communications equipment, adequate funding is allocated to Indigenous communities for the ongoing costs associated with the provision and maintenance of communications technologies. These include costs of internet service provision, training and employment of local people to maintain and facilitate use of the technologies, upgrading equipment and software, and purchase of items such as paper, ink, headphones and CDs.
4. Support Professional Development of educators in the use of new technologies. Educational providers should proactively support the ongoing professional development of teaching staff in the use of new technologies and in the exploration and development of pedagogical approaches that optimise the possibilities for teaching and learning that are afforded by new technologies.

This research study could be further developed in a number of areas, as outlined in the following subsections.

1. Research into mobile technologies in teaching and learning. The ubiquity and relatively low cost of mobile technologies along with their increasing functionality present opportunities and new directions for teaching and learning with Indigenous learners that are worthy of investigation. In part, the solution to the problems around accessibility to communications technologies and the internet could be addressed through the use of mobile technologies. In particular, mobile phones present an opportunity for Indigenous people to own and take control over digital tools that can support their learning, from anywhere and any time, without being dependent on third-party intermediaries to provide access.
2. Research models of flexible delivery for Indigenous learners. Because the digital divide clearly exists for Indigenous learners, further research is required into the development of models of online and flexible learning, and into ways in which digital technologies can be integrated into educational practice, for Indigenous learners. This could involve the development, delivery and evaluation of an online elective module of a course such as CSWEIII, in tandem with continued delivery of face-to-face modules.
3. Research into the connections between formal and informal learning. During the research, students identified that they engaged in activities in the workplace by themselves and with others which provided opportunities to practise English language and literacy skills. Research should be conducted into the development of content and assessment that integrates formal learning outcomes in English language and literacy with students' work and everyday activities and interactions.
4. Research into alternative measurement of student outcomes. There is a strong argument for asserting that there is currently an overemphasis on measuring student outcomes in terms of module and course completions (often as a reporting mechanism for funding bodies) with little formal recognition of other social benefits and outcomes of training, such as social capital outcomes and development of networks afforded by the use of digital technologies in

English language and literacy programs for Indigenous learners. The link between social capital and increased socioeconomic wellbeing (Balatti , Black & Falk, 2009, p. 40) suggests an imperative for doing such research.

Conclusion

There is a strong focus, in Australia and worldwide, on the online and mixed-mode delivery of educational programs. The Indigenous students participating in this study were enthusiastic about embracing the opportunities of digital learning but, as this research shows, technology on its own will not deliver improved educational outcomes for Indigenous learners. As often happens in action research, the spirals of investigation have not provided definitive answers, but rather have increased awareness and understanding of myriad issues involved in computer-based learning for the group of Indigenous adult learners in the Northern Territory who participated in this research. Additionally, the study highlights directions for further enquiry to improve Indigenous participation and success in education, and to maximise the benefits that digital technologies can provide in achieving this aim.

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