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International Journal for Educational Integrity

Understanding the need: Using collaboratively created draft guiding principles to direct online synchronous learning in Indigenous communities

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Abstract

This article reports on the experience of members of an Australian Aboriginal community as they used synchronous computer technologies to enhance their literacy learning. The aspiration to learn meaningful and relevant literacy and computer skills was discussed in focus groups, as well as the need to articulate the group's position within the wider community, the value of the wisdom of the Elders, and the importance of the dissemination of traditional language and Aboriginal knowledge. Educational integrity was deeply embedded in the project's approach to the Aboriginal learning experience, and included ensuring respect for cultural needs and traditions, as well as acknowledging the learners as active participants of their own learning. Successful implementation of the project led to the creation of the Community Strength Model (CSM) based on the premise of Henderson's multiple cultural model, which incorporates ethnic minority and Indigenous culture as a cultural logic to be respected and included in the development of Indigenous e-learning activities. The process of the project helped to clarify the importance of Indigenous and cultural contributions to the model while approaching new learning experiences using digital technologies. The research provides a set of principles to guide future researchers and practitioners in working with technology in Indigenous communities in integrative ways.

Introduction

Globally, education systems are moving to increase access for learners. However, there remains a substantial difference in the levels of educational skill attainment between Indigenous adults and general adult populations. In Australia for example, there are lower levels of participation for Aboriginal (Indigenous) people than non-Aboriginal across all sectors (Australian Bureau of Statistics, 2006). Only twenty percent of Aboriginal adults complete the final year of secondary school (Year 12) compared to nearly half of the non-Aboriginal population (Australian Bureau of

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Statistics, 2006). Most of the Aboriginal adults who have completed their Year 12 education are located in urban areas (Australian Bureau of Statistics, 2006). This suggests that Aboriginal adults living in remote and rural areas of Australia have had limited access to the same level of educational opportunities as the rest of Australia (Biddle, Hunter, & Schwab, 2004). Educational integrity mandates equity of access and bi-culturally inclusive opportunities for all learners. Digital technologies offer a platform to deliver this accessibility and inclusivity.

There has been a recent move towards use of the Internet and various digital technologies to provide greater opportunities within the education system as well as for employment and training development. This has influenced educators worldwide to utilise online environments and digital technologies as tools to meet educational goals and aims (Kral, 2010). The age of digital technology has provided opportunities for new approaches in a variety of contexts including Australian students in early years through to Year 12, as well as students in Technical and Further Education (TAFE) institutions, universities and other post secondary environments. In the expanding adult literacy and learning arena, adult learners now have access to literacy upgrading, employment up-skilling and personal life skills training through various distance and digital learning approaches which provide positive change and increased opportunities. For Indigenous learners, there is another necessary level of relationship building and maintenance that includes the deliberate creation of time and space (Campbell & Christie, 2009) before any engagement in the learning can be effected, as "good community engagement starts with respect, which is a quality of individuals rather than institutions" (Charles Darwin University, 2008). Thus, the process of relationship building is integral to learning in these communities.

Differences in the skill competency levels between Indigenous and non-Indigenous populations indicate a need for literacy skills support for learners who experience limited access due to geographical barriers, government policies, language background, poverty, health or technical insufficiencies. While reports suggest the successful worldwide implementation of distance and digital learning approaches (Sun, Tsai, Finger, Chen, & Yeh, 2008), there is limited information regarding the creation of content and learning experiences through the use of synchronous technologies for Indigenous adults. Recognition by educators that meaningful and respectful engagement with Indigenous communities is the precursor to successful distance and digital learning (Campbell & Christie, 2009) ensures that the notions of integrity, respect, ownership, and long-term and focussed commitment are incorporated.

This article presents an approach to creating design-based principles around content and learning experiences for Indigenous adults that builds integrative learning environments upon Indigenous strengths and knowledge, and which guides literacy learning activities through the use of synchronous learning technologies. Informing the iteratively design-based principles is an understanding of educational integrity that addresses the need for incorporation of Indigenous culture into learning experiences, the importance of respect for all participants, and the value of integrating these approaches in the building of online learning environments. Finally, educational integrity is espoused through the ethical approach of the authors in developing their model for more effective Indigenous online learning experiences.

Synchronous technologies in Indigenous communities

Digital technologies are gaining overall acceptance in Indigenous communities on a global level. The Yanomami communities in remote areas of Brazil, for example, view the Internet as "a potentially very powerful tool in their struggle to preserve their economic, political and cultural autonomy and ultimately ensure their survival in a rapidly changing, globally interconnected world" (Goodwin Gomez, 2007, p.118). Commencing as a native literacy pilot in a village of 100 people, a program called the

Yanomami Intercultural Education Program (PEI) has enabled Indigenous people of Brazil access to online instruction in subjects such as applied computer skills, mathematics and history. The project has developed into “a regional, Indigenous teacher-based program that currently serves over 400 students in 32 village schools” (Goodwin Gomez, 2007, p.118).

Programs that are faithful to both academic and Indigenous knowledge perspectives (Campbell & Christie, 2009) place the Indigenous epistemology at the centre of the learning process and can be very successful. Despite initial scepticism, reports attest to online learning programs providing solutions to effectively address the unique learning and skills development needs of Indigenous learners when these programs are researched, designed and delivered in culturally-appropriate and community-relevant ways (Australian National Training Authority, 2002; Battiste, 2005; Greenall, 2005).

Greenall and Loizides (2001) document examples of several First Nations (Indigenous) communities in Canada who are embracing the use of technology for literacy and essential skills training to:

- create employment and economic development opportunities;
- promote the acquisition of knowledge and development of essential skills and attitudes in order for individuals to become self-sufficient, valued and contributing members of their knowledge community;
- preserve language and culture and to exchange with other cultures; and,
- enable Indigenous people to participate in the knowledge and information technology economy (Greenall & Loizides, 2001).

Through provision of adequate technological capacity and qualified instructors, trained specifically in the methods of curriculum development and course delivery, Indigenous learners could gain much from the implementation of synchronous technologies (Daniels, 2003; Greenall & Loizides, 2001). Specific aspects of synchronous learning technologies concur with the learner-focused, personal interface and co-operative group aspects valued in adult learning with Indigenous populations (Australian Institute for Social Research, 2006; Greenall, 2005; McMullen & Rohrbach, 2003; O'Lawrence, 2006). Effective approaches to training development in remote and regional communities require a range of tools. “The focus on improving engagement is connected to having the flexibility to imagine alternate ways of working with people” (Wallace, 2009). Online learning platforms typically achieve higher success rates than previous methods of print-based distance learning, which expected all learners, regardless of cultural considerations, to utilise identical materials based on Euro-centric principles (Brescia & Daily, 2007; Facey, 2001; Zepke & Leach, 2002).

Through their work with Indigenous learners in Canada, Eady (2007) and Greenall (2005) have elicited the benefits of creating synchronous cyber-classrooms utilizing programs such as CENTRA and ElluminateLive. Through use of such software, learners and instructors can socialise in real-time; creating a learning community to which Indigenous learners have responded positively (Eady, 2007; Greenall, 2005). Since training is a social activity, this engagement allows initial cross-cultural negotiations that lay the groundwork for the establishment of relationships. The community maintains the integrity of relationship that it achieves as a result of engagement deeply rooted in the development of trust (Anderson, 2009). “Active engagement and learning for the partners both in process and outcome [realizing] demonstrable and ongoing commitment, clear expectations, and trust [with] tangible outcomes for the community” (Garlick & Pryor, 2002, p. 6).

Through a partnership with an adult literacy organization and a community college, the Teacher Assistant Career Training (TACT) Program was designed to offer learners in eighteen remote First Nations communities in Ontario, Canada an

opportunity to strengthen their skills as teacher assistants (Eady, 2007). The online curriculum included classroom assisting, educational programming, child development and learning exceptionalities. Upon completion of the course, 80 per cent of the participants indicated their improved job performance and confidence of obtaining a better job following training. Forty per cent of the participants went on to complete additional training in an online environment.

Another project designed to enhance success in education for Indigenous adults, the Sunchild e-learning Community, is an online learning project that addresses the lack of literacy skills for residents living in Northern British Columbia First Nations in Canada (Greenall, 2005). Reporting on the project's initial implementation, Greenall (2005) indicated a 62.5 per cent successful completion rate by First Nations communities Sunchild learners using an online format, compared to 34 per cent of non-Sunchild learners using strictly print-based distance learning materials.

The Sunchild project utilises a polysynchronous learning platform, combining both synchronous and asynchronous methodologies. Learners are provided with a blend of a real-time instructor supported e-learning which involves audio, whiteboard, and chat capabilities enabled by compressed software (WebCT and Elluminate Live) operating over a common phone line in the community. This combination of platforms provides high-quality instruction and is congruent with the demands of work and family. High success rates are attributed to use of on-site mentors who provided administrative functions and technological support. This made academic and personal support mechanisms available to students. Greenall reflected upon the learner feedback in the final evaluation report:

> Learners also cited the sense of confidence and pride that they felt having achieved success. For many, the traditional classroom was an uncomfortable environment, one where they had trouble learning. Sunchild offered them a different way to learn, conducive to their own needs, learning styles and personal circumstance. (Greenall, 2005, p. 24)

This would suggest that the polysynchronous environment is congruent with the suggestion of Campbell and Christie (2009), that there is a "need to create socio-culturally appropriate spaces where Aboriginal [Indigenous] people feel at ease". McDonald, O'Callaghan, Walker and Fyffe (2006) provide an evaluation of four e-learning projects funded by the Australian government that aim to increase Aboriginal engagement in employment and small business. The online learning projects examined include prevocational skills for mining and associated trades, entrepreneurial skill development for micro-business, and education in governance skills for Indigenous communities. In addition to imparting the intended skills, McDonald et al (2006) indicated the following social outcomes were also achieved for individuals and communities:

- improved self-confidence;
- people encouraged back to employment and training;
- families remaining on traditional land; and
- increased awareness about Indigenous history.

Boughton and Durnan (1997, p.118) quote an Aboriginal teacher who articulated the idea that when the participating students' integrity is reflected in the teaching, they "stand a far better chance of making it…because they are holding on to their Aboriginality".

In support of its mandate to increase access to the vocational skills acquisition relevant to the needs of the current economy, the Australian Flexible Learning Framework (AFLF) developed several online toolboxes with content specific to the

needs of Indigenous learners. Defined as "a collection of resources, suggested learning strategies and material to support online delivery of qualifications from recognised Training Packages" (Australian National Training Authority, 2002, p.5), current toolboxes accessible to Aborigines in remote locations include the use of web-based resources in conjunction with asynchronous supplements such as CD-ROMs to provide skill instruction in such vocational areas as horticulture, mining and maritime operations.

In 2005, the AFLF undertook a project to determine the effectiveness of its toolboxes. Delivery trials were conducted in a range of locations, and in a variety of educational settings that included learners of different ages, cultural backgrounds and language groups. It was determined that Aboriginal learners benefited through engaging with AFLF toolboxes that contained Aboriginal content and that were tailored towards the interest and realities of Aboriginal adults. Bamblett (2005) makes several recommendations to improve employment of AFLF's toolboxes for Aboriginal learners, which include many of the following elements:

- cultural inclusion;
- realizing the importance of using graphics in delivery and content;
- provision of instruction in basic computer skills for learners;
- assuring staff knowledge and ability to use the technology; and
- implementation of community-based mentors and technological support.

These elements highlight the nature and quality of the relationship desired to achieve educational integrity in these contexts (Sithole, Hunter-Xenie & Dunnett, 2009). The implementation of community-based mentors and technological support endeavours to address many issues of concern to Indigenous communities. These include issues that might not be taken into consideration in a top-down approach that incorporate community needs, decision making, future goals, and so on (Gorman, 2009). In addition to using synchronous technology to enhance education levels and achieve work-related outcomes, synchronous technology is also being implemented in the areas of original knowledge and language continuation. As Indigenous knowledge is traditionally transferred through an oral tradition of speech, storytelling, song, and dance, the inclusion of audio and visual curricula is an essential addition to incorporate cultural components into lesson design and delivery for Indigenous learners (Australian Institute for Social Research, 2006; Christie, 2005; Daniels, 2003; Eagles, Woodward, & Pope, 2005; Paulsen, 2003; Sawyer, 2004). Current literature reflects the use of audio and visual elements using tools such as videoconference equipment and web-based voice applications to implement the synchronous delivery of first language instruction to Indigenous learners who are challenged by the use of text-heavy curriculum materials (Aderinoye, Ojokheta, & Olojede, 2007; Australian Institute for Social Research, 2006; Daniels, 2003; Eagles, et al., 2005; Sawyer, 2004).

Synchronous technology is being implemented in the School of Australian Indigenous Knowledge Systems at Charles Darwin University (CDU) through collaboration of researchers and online content specialists to develop Aboriginal language and cultural databases that will be delivered in an online format. Through multimedia formats of sound and visual graphics in web-based applications, Christie (2005) is optimistic that "there may be a chance for people to make a much richer representation of themselves, and to do it using their own traditional rules about how to go about it" (p. 8). Online learning programs can effectively address the unique learning and skills development needs of Indigenous learners. Students achieve greater success when desired Westernised educational outcomes place Indigenous epistemology at the centre of the learning through implementation of culturally-appropriate and community -relevant research, design and delivery.

Through synchronous learning technology, an Indigenous group in the United States, the Choctaw Nation of Oklahoma, created a 16-week community language program which encompassed "literacy, vocabulary acquisition and conversation" (Haag & Coston, 2002, p.72). Running four consecutive sessions between Spring 2000 and 2001, consisting of three separate classes per day, the Rotor Learning System attracted nearly 350 learners per session (Haag & Coston, 2002). The curriculum of Beginning Choctaw and History and Culture was delivered live by instructors through streaming audio and video teaching components, while the students communicated by typing text. Success of this program encouraged further development through enhancement of technology to provide a two-way system of communication. The Choctaw Nation of Oklahoma's School of Choctaw Language continues to offer language instruction in three different levels using synchronous software called Avacaster (School of Choctaw Language, 2009).

The previous examples of online synchronous learning within Indigenous communities highlight implications for literacy practitioners and curriculum designers working in this area. Practitioners and designers need to be cognizant of methods Aboriginal people have used to process information throughout history (Antone et al., 2002; Donovan, 2007; George, 1997; McMullen & Rohrbach, 2003; National Aboriginal Design Committee, 2002). Reflecting on his research with the Yolngu society of the Northern Territory region of Australia, Christie explains this in the context of language:

> Of course many new words and ideas are added into languages all the time, but in Aboriginal society, new knowledge is not valued above old knowledge. New knowledge only has meaning and value through its ability to be tied to received knowledge and identity. (Christie, 2005, p.2)

Cultural curricula must be reflective of the ownership of the community from which the cultural component originated and to which it is being delivered (ANTA, 2002; Christie, 2005). In this way, educational integrity is promoted through and as a community strength.

Building educational integrity from community strength

In the recent research project entitled "Creating Optimal Literacy Learning Environments Using Synchronous Technologies to Effectively Support Aboriginal Adult Learners: A Narungga Perspective" (Eady, 2010), the author illustrates a vivid example of a learning opportunity built on community strength. Learning to use synchronous computer technologies and enhance literacy learning was the desired Westernised educational outcome for the Narungga Aboriginal community. This community was identified through a partnership already in place between the community and the working team of the Digital Bridge Unit (DBU) a division of the Department of Further Education, Employment, Science and Technology (DFEEST), which was established to assist in reducing the socially and economically divisive nature of technologies through encouraging the use of technology within disadvantaged groups (South Australian Government, 2010). In communication with the DBU, the Aboriginal community had already shown their eagerness to embrace digital technology. Once ethics had been approved, the researcher visited the community to define their interests and needs, to discuss the depth of the research and the commitment required on behalf of the community, as well as to leave information and contact details. This introduction promoted a partnership-based approach where community council members discussed issues that their community members faced, as well as discussed the benefits of involvement in the research to both their community and other Aboriginal communities as a result.

Since community engagement is about creating time and space where knowledge systems can interact respectfully (Gorman, 2009), the researcher first gained

permission to enter the community and showed respect through contacting the community manager and asking permission to come to speak to the community council. At this meeting the researcher requested formal permission to spend time in the community and the council in turn welcomed the project to take place. The researcher took great care in ensuring that she was allowed, and welcomed, into the community and treated the privilege with great respect. This approach was in agreement with Gorman, who points out that:

> Working closely with an Aboriginal community can be seen as intrusive but is much less likely to be taken that way where a connection already exists and level of trust has been established with participants. Often a researcher will be adopted into a particular family and moiety that will allow the community to understand the researcher's place within their Aboriginal construct (Gorman, 2009, p.89).

Nine weeks of observations occurred in the community between October and December 2008. Although most of the observations took place in the Aboriginal community, there were other observations that occurred at various meaningful locations during the period of the study. During this time the community members were asked to participate in a group meeting or activity two or three days per week for approximately three hours each day. These interactions were recorded. Community members were also invited to attend a focus group discussion. During this discussion - held in a safe, known environment - the community members were able to express their concerns and identify the needs in their community. A desire to learn meaningful and relevant literacy and computer skills, as a means of helping to articulate the power of position within the wider community, was expressed, as was the value of the community Elders' wisdom, traditional language and Indigenous knowledge. Considerate scaffolding from the researcher was essential to support the motivation and the agency of the community in the learning of new skills that enabled community members to share their stories and take pride in their accomplishments. This positive experience fostered explorations of other ways that participants could share strengths and concerns for their community. While further dialogue was entered into regarding other community developments that could be supported using the synchronous platform, the integrity of the process that engendered respect and garnered trust through validation of Aboriginal Ways of Knowing as the basis on which to build the learning platforms was illustrated through the participatory development of the chosen project, articulated out of concerns for the community school. Full participation of communities and ordinary people in constructing their own research knowledge (Hooley, 2002) engendered equity through the broader integrity of the process.

The learning experiences of this research were successful, due to the relevant content for the learners combined with the strengths and the components of those strengths in the Aboriginal community. As Barta (2002, p.78) has pointed out, "the Indigenous paradigm or Native Ways of Knowing relies on an awareness and respect for all things, and includes the holistic and relational way of perceiving the world and a striving to live in harmony within one's sphere". Barta's perspective informed the approach to this learning experience and ensured respect for the cultural needs and traditions of the community members, as well as acknowledging the sensitivity to the learners as active participants of their own learning. The integrity of this process engendered further discussion about future goals and directions and the success of the project led to the creation of the 'community strength model' (CSM) (Eady, 2010).

Eady's community strength model is built on the premise of Henderson's multiple cultural model (Henderson, 2007), which incorporates ethnic minority and Indigenous culture as a cultural logic to be taken into consideration by researchers and practitioners in the development of e-learning activities in Indigenous communities. It also assumes that members of Westernised cultural logic understand how to view Indigenous cultural logic in the context of e-learning environments. In a closer

examination of Henderson's five identified sub-cultures that impacted e-learning in Indigenous communities, the researcher recognised that the Indigenous and minority culture required further incorporation into the research. The process of the project helped to clarify the importance of Indigenous and cultural contributions to the model while approaching new learning experiences with technology.

Figure 1: The community strength model (CSM)

The community strength model (CMS) illustrated in Figure 1 above is an attempt to graphically represent a focus on the Indigenous communities' contribution to e-learning. The model suggests some of the more in-depth attributes of working with communities of which researchers should be cognisant, and should respect and incorporate, in order for true educational integrity to prevail in research done in cooperation with Indigenous communities.

This project led to the proposal of another layer within Henderson's "Indigenous and ethnic minorities culture" that suggests community strength as the core of learning experiences in Indigenous communities. As pictured above, the CSM suggests that there are four main components, which can be specific to Indigenous communities and are presented as an extension of the socio-cultural theory (Vygotsky, 1978), situated learning theory (Lave & Wenger, 2006), and the multiple cultural model (Henderson, 1996), which promote educational integrity yet have not been empirically identified as reliable components to consider in relation to e-learning approaches in Indigenous communities.

In order for educational integrity in bi-cultural practice to be recognised, one must understand the ways Indigenous cultural logic can provide meaningful and valuable insights into learning experiences. Often Westernised cultural logic dominantly overrides the more subtle attributes offered by Indigenous cultural logic. Cultural denigration or discontinuity borne of educational programs that either disregard or inadequately accommodate traditional knowledge and practice are significant contributors to the diminished health of Indigenous communities (Grossman, 2008). So the questions pertaining to educational integrity should consider what we are looking for within these cultures and how we can foster learning experiences that become examples of successful and authentic bi-cultural practices with high regard to educational integrity. This research suggests that a major attribute of the Aboriginal community in question not considered in the past was their community strength. There are many definitions and interpretations of strength (Breiman, 2001; Gordon,

1967; Petty, 2005) including strength in numbers, power, academic ability, sporting prowess, the arts, music and dance, as well as in an individual's ability to work with others. Once someone realises his or her individual strength, talent or passion, it can be augmented by a sense of confidence and a willingness to consider sharing it with others. The learning experience within the Aboriginal community in question in this instance was built on an event specific to this particular community (an anniversary) and drew on the strength of the broader Aboriginal community voice (with its commmunity concerns and respect for Elder's wisdom, traditional language and Indigenous knowledges). The learning experience responded to a self-identified learning need that in turn satisfied a Westernised cultural education outcome which resulted in an authentic and successful bi-cultural practice. This community strength model (CMS) therefore incorporates four continuous properties that are developed in everyday practices:

Community strength

In the Aboriginal community context, strength grew from identification of what was important to the community. The community was preparing to celebrate 140 years of their existence. There was a large celebration planned and the community was bursting with pride and buzzing with excitement. Many community members were helping with preparations. One project involved sorting through hundreds of old photographs and making a display for visitors and community members to enjoy. A strength noted for this community was the ability to come together and work for a common cause.

A powerful tool in supporting educational integrity is promoting bi-cultural practice through the voice of the Aboriginal people involved in the process. In this research, intergenerational sharing and passing down of culture and wisdom, strong communication skills in traditional language, first language, and English constituted the voice of the community. There was also a strong need to provide a safe environment for people to express themselves freely and to be respected and validated in their sharing. The following components are the contributing factors to authentic community voice.

a. Community concerns: authentic voice fosters confidence to raise concerns for the community such as discussed in the community focus group. Some of these concerns included employment issues, lack of literacy skills, worry for the future of the children in the community, or the fear for the local school closing (a concern specific to this community).
b. Power of position: some community focus group members were concerned with the lack of power of position that they had in the greater Westernised world. The members felt that they were getting further and further behind, especially with things like computers and related digital technologies. The power of digital literacy and learning were seen as tools that would strengthen the voice of the community and be used to help the community to be confident and be heard as an important entity who had rights and needs as a viable Australian community. The issue of the unknown future of the local school brought forth a need to express these concerns and be heard in an equal and respectful way.
c. Strength of Elders: the voices of Aboriginal Elders were particularly inspiring. In this research project, three Elders participated in the collaborative community engagement project and contributed to the creation of the online synchronous presentation. The Elders related stories that enhanced the process, and provided first-hand recollections about the early years of education in the community. As a result of their participation in the project, many of the focus group members heard stories and were made aware of community information they had never before been told.
d. Traditional language: a further important aspect of voice was the use and preservation - and in some cases the revitalisation - of traditional language. It was very important to the community to ensure that portions of the presentation

of their project were executed in their traditional language. Audio files of the local children singing songs in their traditional language were also added to the presentation.

e. Indigenous knowledge: finally, an aspect of authentic voice to consider is that of Indigenous knowledge. Where training is developed to contribute to community development goals, the training itself should incorporate components of Indigenous knowledge that must be developed and assessed by local Elders and other community members (Miller, 2005). Knowledge, in terms of Indigenous culture, involves much more than satisfying a need to understand, or a curiosity about something. Indigenous knowledge delves deeper than cultural systems, encompassing "the expression of the vibrant relationships between people, the ecosystems, and other living beings that share their land" (Battiste & Henderson, 2000, p.42).

Shared learning experiences

An environment in which learning could take place emerged from within the group in response to a self-identified learning need which in turn satisfied a Westernised cultural learning outcome once community strength was identified. The members were given an opportunity to share their concerns in a non-threatening environment and in a way that incorporated Elders' wisdom, traditional language and Indigenous knowledge. These experiences were supported through mentoring from both within and from outside of the community. The employment of Indigenous people as mentors encourages appropriate incorporation of community ownership, direction and aspirations, providing the crucial cultural link between the training programs, the community and the training provider and education system. The learning experiences were meaningful tasks relevant to the cause and supported by these mentors, as well as skilful teachers and administrators. Many of these tasks could be done in collaboration with others through an online synchronous platform, sharing the same concerns creating a community of practice (Lave & Wenger, 2006).

Goals, directions and development

The final section of the community strength model (CMS) suggests that an ongoing concern for Aboriginal community members is the creation of, and seeing through, manageable community-wide and relevant goals and directions for the community which lead to further community development. From learning experiences based on authentic voice, existing community strengths can continue to grow and provide confidence to encourage further implementations of voice resulting in abilities to further identify, articulate and foster the goals, directions and development of the community itself. Making long term commitments to work with particular groups of Indigenous people directly relates to relationships being the cornerstone of engagement and underscores the integrity of the process (Campbell & Christie, 2009). For the community who worked together on this research project, the goal was to get a message out to the wider community about the importance of the local community school, what it meant to the community and how it influenced the preservation of culture and language. This community had a deep concern for their children and the future generations of the community and hoped to see their school reopen for older children. Further, they identified this as a direction they would like to pursue. These goals and directions led to larger community development directives, which required community strength, emanating from an authentic voice that fostered learning experiences' progression with goals, direction and development. The circle continues, the learning opportunities grow, educational integrity is fostered and the Indigenous community strengthens from within.

Stepping up: The complexities of Indigenous communities, digital technologies and educational integrity

Research with human participants requires a great deal of care and caution, and working with Indigenous community members is no exception and perhaps increases the complexity of the research where two cultures with varying belief systems try to work together. Effective Indigenous community engagement involves a commitment to divergent knowledge practices and the collaborative articulation of new forms of pedagogy and research (Christie, 2006).

This research set out to provide a set of principles to guide future researchers and practitioners in working with technology in Indigenous communities in integrative ways. The design-based principles are the result of carrying out the four phases of the design-based research approach and produced eleven design-based principles (DBPs). These principles for establishing optimal learning environments for effective use of synchronous technologies to support adult Indigenous literacy learners while maintaining educational integrity in the process are listed below.

DBP1: Develop skills and awareness of Indigenous learners' profiles

- Develop your technological skills.
- Present yourself in confident, competent, adaptable and flexible ways.
- Maintain an awareness of indigenous literacy levels and preferred learning styles.
- Make learning relevant to the community's needs.
- Create opportunities for learning experiences that are both learner focused and learner driven.
- Consider appropriate expectations of adult Indigenous learners.

DBP2: Create opportunities to participate in an online learning community

- Understand Indigenous learners' past learning experiences in order to assist them to effectively participate.
- Include opportunities for social networking, interpersonal relationships, cultural relevance, traditions and values.
- Consider Indigenous learners' and community's current social struggles.
- Incorporate opportunities for all parties to share and collaborate in the online environment.

DBP3: Utilise relevant content

- Deliver relevant, meaningful, applicable, and computer adaptable content for use with synchronous technologies for Indigenous adults. For example, content that:
    - helps indigenous adults better understand their identity as an Indigenous person;
    - connects content to cultures and traditions;
    - encompasses community values;
    - grows from community knowledge;
    - assists in gaining employment; and
    - is created in consultation with the community.

DBP4: Value cultural inclusion

- Consider culture in all instruction and implementation stages of synchronous learning opportunities including:

    - geographic area;
    - living conditions;
    - socio-economic status; and
    - language group.
- Consult with the community regarding culture at every level of instruction.
- Aim to implement an indigenous curriculum that is created from within the community, involving community members, delivered by community members for community members.
- Use learning materials and resources that are community centred and grounded in local language.

DBP5: Support implementation of technology that is accepted, accessible, suitable, and reliable

- Consider cultural values, social issues, fiscal constraints, technological support and physical space in the community.
- Introduce technology to the community appropriately and allow for community choice in type of technology.
- Ensure the community understands the benefits of synchronous technology such as: social networking and family connections, community capacity building, links to other communities and professional training for community mentors.
- Be aware of the current state of technical equipment and the barriers to computer learning in the community.

DBP6: Foster intergenerational community involvement

- Ensure a locus of control by the community when using online technology.
- Develop learning tasks that promote and encourage a whole family, whole community approach and include children through Elders in the process.

DBP7: Build positive relationships, engage mentors, and provide technical support

- Incorporate where possible and encourage several types of mentors including: onsite mentors, peer mentors, community mentors, Elder mentors, liaisons, technical support people and practitioner mentors.
- Ensure technical support is available to the community.
- Encourage practitioners and mentors to:
    - make time for relationship building and gaining trust;
    - gain respect of the community by obtaining permission to be on the land;
    - meet with community council regularly;
    - have energy to put into engaging learners;
    - be approachable;
    - support learners academically and emotionally;
    - scaffold computer skills;
    - show respect for community and members;
    - be sensitive towards learners;
    - take time to understand the community;
    - ensure down time for to avoid burnout;
    - be willing to become an active participant in learning; and
    - implement technology that is enjoyable and relevant to the community.

DBP8: Promote community-based learning

- Facilitate community collaboration.
- Provide opportunities for the community to see the benefits of new technologies through a holistic kinship approach.
- Use indigenous strengths (for instance, include oral storytelling, song, the Dreamings and language) in these contexts to promote familiarity and a feeling of comfort for learners.
- Allow the learners to choose the location and setting of learning projects.

DBP9: Cultivate genuine partnerships with government

- Develop relationships with key stakeholders in order to promote meaningful, relevant, empowering and real-life online learning opportunities.
- Consider a third party liaison that could possibly better connect the community with government services.
- Be aware that funding is required in most aspects of online learning environments.
- Use online synchronous technology to act as an affective filter which can enable the community members to represent themselves in their own voice directly to the government.

DBP10: Understand community goals, directions, and development

- Implement synchronous learning tools as community development support systems by providing links to the outside world and finding ways that technology can make communities more self-sufficient.
- Understand the deep concern of many Indigenous communities for their children and future generations. Know that this concern is at the core of many communities' desire to learn about technology.

DBP11 Embrace Indigenous (Aboriginal) ways of knowing and learning through Elder education

- Embrace Aboriginal Ways of Knowing and Learning and incorporate these attributes throughout learning processes.
- Consider Elders a unique subculture of teachers.
- Involve Elders in all stages of new learning experiences and environments.
- Respect Elder education and wisdom.
- Welcome Elders to share and pass down their knowledge in Aboriginal synchronous learning environments.
- Engage in learning opportunities from Elder expertise.

Conclusion

The Community Strength Model (Eady, 2010) and the eleven design-based principles presented in the last section of this paper are a step towards maintaining educational integrity through fostering bi-cultural inclusivity in research practices. The Westernised research norm requires a flexibility that needs to be incorporated at every level when working with Indigenous communities. Through recognizing the strengths of Australian Aboriginal communities and recognizing the importance of the principles outlined in this paper, researchers and practitioners alike can be assured that the educational integrity of their work is sound and can look forward to improved relationships and more welcomed research opportunities with Aboriginal communities.

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