Constructing Shared Online Learning Environments for Indigenous Cultural Inclusiveness

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Abstract – **The Faculty of Information Technology at the University Technology, Sydney has begun a project to improve the participation of Indigenous Australians in the Information Technology sector. As Indigenous students begin to move into computer studies, issues arise of how to provide them with an online learning environment which is culturally inclusive. A major challenge lies in the fact that this new cohort must share online learning with other students from diverse cultural backgrounds. A review of several studies of Indigenous distance education reveals that online technology must satisfy certain conditions to be effective including flexibility, interactivity, minimal text, and cultural appropriateness. Generally, this Indigenous experience agrees with theories of culturally inclusive educational technology design. However, there remain issues of cultural specificity of certain aspects of screen design which cannot be ignored. A model for constructing an online learning environment is proposed consisting of a shared domain, included in which is an Indigenous-specific virtual space and optional customization for individual learners.**

I. INTRODUCTION

In September 2002 the Faculty of Information Technology at the University of Technology, Sydney (UTS) began a major new initiative to attract Indigenous Australians into Information Technology (IT) courses and hence to increase Indigenous participation in the IT industry. This followed a research project the previous year which showed that very few Indigenous students undertook studies in IT at the tertiary level and therefore few found employment as IT professionals [1]. As a result of the new program Indigenous student enrolment has already increased from two students in 2001 to four students in 2002 and now five students in 2003. Numbers are expected to increase much more once the program becomes better established. Indigenous students undertake mainstream courses, with most enrolled in the undergraduate program and two postgraduate students in 2003.

The growing numbers of Indigenous enrolments is most welcome, but the program will only be truly effective if these students complete the courses they have begun. Proper student support has been identified as a significant issue for Indigenous learners and has been addressed by the employment of the Faculty's first two Indigenous staff members and the establishment of a new Indigenous student resource and support centre within the Faculty [2].

Another important issue in academic success is that of cultural alienation. A major report commissioned by the Australian Government noted the loss of cultural identity that many students feared from attending university. Students reported feelings of alienation, discomfort and resentment at being expected to conform. One student commented that 'the uni is an assimilation process and so the clash of cultural values etc plays an important part' [3]. For many students it is a choice between succeeding and losing their identity, or maintaining their identity, rejecting assimilation but failing their course [4].

Already, in several subjects within the Faculty of IT, the issue of alienation and Indigenous cultural inclusiveness is being considered in terms of introducing small amounts of Indigenous content into the face-to-face teaching and into assessment items. These changes may be fairly superficial at present but no doubt in time will deepen as the need to make the courses appealing and relevant to this new student cohort increases with the growing numbers.

An equally difficult challenge lies in making the online experience of Indigenous students culturally inclusive as well. Each semester the undergraduate students supplement their traditional face-to-face education with online learning. Depending on the subject, this may include the use of discussion boards, chat rooms, email, online file sharing, online curriculum, online testing facilities, and a range of virtual simulation tools. These are provided via three main online environments from which the subject coordinators are free to choose: a collaborative suite of tools designed by the Faculty of IT, another based on the Blackboard model available across all faculties at UTS, and Cisco online facilities specifically for networking students.

A particular difficulty in adapting any of these to Indigenous needs is that they must share online facilities with non-Indigenous Australians and overseas students from many cultural backgrounds. At present the number of Indigenous students would not warrant the creation of a separate, dedicated, Indigenous website, even if this were considered desirable.

The aim of this paper is to explore the issues involved in providing an inclusive online environment which will support our Indigenous students learning IT while not alienating our non-Indigenous students. In order to do this, firstly the evidence regarding usage of online learning technologies by Indigenous Australians will be presented. The conclusions from these studies will be compared to models of culturally inclusive educational technology design. Finally, a model is proposed for an online learning environment which provides culturally appropriate features for Indigenous students.

II. INDIGENOUS AUSTRALIANS EXPERIENCE WITH ONLINE TECHNOLOGIES

Here I summarize the findings of the four main studies of distance education provision to Indigenous students across Australia.

A. The Anangu Teacher Education Program, South Australia

A study by George identified several characteristics that online technologies must have to be successful for Indigenous Australians living in remote traditional communities:

1) Distance from the Dominant Culture: For Indigenous students to preserve their culture, the technology must provide "an educational experience which minimizes cultural intrusion".

2) Minimal Text: Australian Indigenous culture traditionally depends on oral and pictorial means of communication and expression. Students may therefore have lower levels of paper-based literacy than non-Indigenous students. Additionally for remote students English may not be their first language.

3) Interactivity: A high level of interactivity and negotiation is necessary because delivery of education to Indigenous students is cross-cultural in nature since teachers are often non-Indigenous.

4) Flexibility: The technology must be flexible with respect to time in order to allow students to fulfil their cultural, social and work-related obligations. Attendance at religious ceremonies and funerals is often of great importance in Indigenous communities [5].

George found that different online technologies satisfy these requirements in varying degrees. In particular, she highlights the need for both synchronous and asynchronous technologies. Synchronous technologies have the advantage of providing immediate feedback but tie the participants to a set time. Asynchronous technologies, on the other hand, provide scheduling flexibility but no immediate feedback to students. Together the two provide a balance in educational provision.

B. Australian Catholic University Indigenous Education Program, New South Wales

Another study by Grant looked at providing distance education to urban and rural students. Like George's students, Grant found that they displayed a "willingness and capacity to embrace innovation" where they saw that it would be of value in their cultural context [6]. In her study the students learnt to use email and listservs as well as contributing to a web site.

Her findings confirm and expand on George's. She stresses the importance of:

- culturally sensitive material
- the inappropriateness of using extensive amounts of text
- the need for interactivity between all participants, as well as between students and the material being studied
- and finally flexibility over time as well as with regard to the number of students.

Of these requirements, Grant gives special emphasis to interactivity and flexibility. Examples of online tools which provide both of these are the asynchronous technologies of email, listservs and discussion boards.

C. Network Learning Centres, Western Australia

In a third study, Rehn records student reactions to some of the technologies used in providing distance education to remote communities. He notes that Indigenous university students enjoyed point-to-point chat-room communication with their teacher and found it "stimulating ... non threatening ... yet still personalised and human" [7]. Students also worked successfully with email.

D. Pathways to Learning, Western Australia

A more ambitious project has been the launch of an Indigenous online bridging course reported by McLoughlin and Oliver [8]. The design of the website is based on Henderson's Multiple Cultural Pedagogic Model of interactive multimedia instructional design, and also on a constructivist, community of practice model, which recognizes the students' capacity to build their own knowledge and bring their prior experience to this process. Cultural appropriateness is first apparent in the use of plenty of graphics incorporating both traditional and modern Indigenous imagery. Furthermore, a variety of online tools is provided to support the target group including:

- an online journal for reflection
- course resources to which students can contribute
- a chat room "Yarning Place"
- shared workspaces for collaboration on small group projects
- an online helpdesk
- online mentoring
- email
- news bulletin
- discussion board
- FAQs where students can place their own questions

Principles underlying the web design include:

1) Socially-situated Learning: Students share learning and knowledge through online tools which allow for communication, social interaction and collaboration.

2) Flexibility: Tasks are negotiated and students determine their own goals, pace of learning and sequence of tasks.

3) Ownership of Learning: Students are able to choose and reflect on their learning. There is a move away from an instructivist approach, where all texts are prescribed, to a constructivist approach, where students post URLs for new resources and discuss alternatives on discussion boards.

4) Authenticity: Tasks reflect Indigenous community needs while taking into account the need of students to become bicultural and learn how to function in mainstream Australian society.

5) Support: Students are provided with online support in developing competencies, access to mentoring and immediate feedback when required.

6) Clear Roles and Responsibilities: There is both an awareness of student needs and also clear communication of expected outcomes [9].

There is obviously much overlap between the principles incorporated in the Pathways to Learning site and those advocated by George and Grant. In all these studies the central concept is one of communication, interaction and flexibility within a culturally appropriate online space. The Pathways to Learning project, however, goes beyond the previous researchers in placing a greater emphasis on support and also on the construction of knowledge by students.

III. SHARING AN ONLINE ENVIRONENT: MODELS OF MULTICULTURAL DESIGN

These studies of Indigenous experience with online learning provide useful guidelines for designing Indigenous-specific virtual environments. The challenge at UTS lies, however, in constructing an environment which is amenable to all students whatever their cultural background, whether they are Indigenous Australians, non-Indigenous Australians or students from overseas.

Here, two models of multicultural online design and their implementations will be examined and compared with the Indigenous experience in order to try to find some commonality of approach.

A. The Multiple Cultural Pedagogic Model

Henderson's model, on which the Pathways to Learning project was based, recommends flexibility and interaction with both materials and ways of learning that embody many different cultural perspectives [10]. She proposes resisting the mediation of the dominant culture through online technologies and instead suggests an eclectic paradigm in which multiple cultures can co-exist while maintaining their integrity.

However, Henderson's theory does not explain precisely how an online environment can be completely adaptable to all cultures. In applying Henderson's model, the Pathways to Learning project adopted a very Indigenous-centred screen design, which is hardly multicultural and may not be acceptable to non-Indigenous students.

B. The TeleTOP Method

Another model for culturally inclusive design, which has been implemented in Holland, is the TeleTOP Method reported by Collis [11]. Like the researchers into Indigenous online learning, Collis emphasizes flexibility, which she sees as necessary to build into the system at the very beginning. Some of the principles which promote flexibility are:

1) Minimal Given Text and Graphics: Text which is fixed to the screen should be kept to a minimum, supplemented by a minimum of graphics and icons. This empty initial environment is then filled with contributions and communications from teachers and students as the course proceeds.

2) Interactivity: The emphasis should be on interactivity between participants rather than human-computer interaction. A variety of both asynchronous and synchronous tools should be provided. Students should be able to communicate as much or as little as they like, choose the language as well as the style and tone of communication.

3) Flexible Roles: Both teachers and students should be able to take on different roles over the duration of the course, for example instructing or constructing, working in teams or working individually.

4) Variety of Resouces: Both students and teachers input and use a variety of resources including multimedia and student- and teacher-created materials.

There is an assumption in the TeleTOP Method that by creating an online environment where students communicate freely, create resources and assume self-appointed roles that they will construct an environment which is appropriate to their own culture. Though this is a good start, it ignores the fact that even the minimum of graphics and icons recommended in the interface design will remain specific to one culture. As Stoney and Wild remind us, elements such as colour, images, symbols and screen layout are very culturally specific [12].

Furthermore, in the Australian context, the minimal text recommended by Collis would also, of necessity, reflect the dominant English-speaking culture. The principle that students should be allowed to choose their language of communication is tokenistic in that, to convey meaning to others, they are highly unlikely to choose anything except English.

Yet, it is obvious that there are many features of both Henderson's Model and the TeleTOP Method which agree with the Indigenous online learning experience. Principles from both could well be applied to all groups of students and form the basis for a shared online environment.

IV. AN ONLINE ENVIRONMENT FOR CULTURAL INCLUSIVENESS

In order to construct an Indigenous inclusive environment which also allows for other cultures I propose the following solution, which is summarized in Figure 1. The model virtually mirrors the structure of the Faculty of IT with its new Indigenous centre located within the broader educational facilities available to all students.

A. Shared Online Learning Domain:

The core of the online learning site is built on principles derived from the Indigenous online learning experience and supported by theories of culturally inclusive online design. These include flexibility, interactivity and a comprehensive suite of online tools. Text and graphics are kept to a minimum since these aspects are often culturally determined. The design encourages students to construct knowledge and share it with others, and so this common space will come to reflect the various cultures of the students inhabiting it.

B. Customized Indigenous Virtual Space

Customization is already available in varying degrees in online learning environments. For example, teachers and students are usually given different privileges in terms of how much of a site they can view and what changes and interactions are allowed. There is no reason why Indigenous students cannot be given a special privilege to enter an online space customized with Indigenous screen designs, graphics and language as well as provided with special tools and support services as appropriate. It is a "hanging out" place, a refuge from the dominant culture, a way of building firm relationships with fellow Indigenous students, and a method by which the Faculty of IT can provide the added support often needed by these students.

At the same time it does not preclude full participation in interactions with students from other cultures since this culturally specific Indigenous space is enclosed within the Shared Domain, inaccessible to non-Indigenous

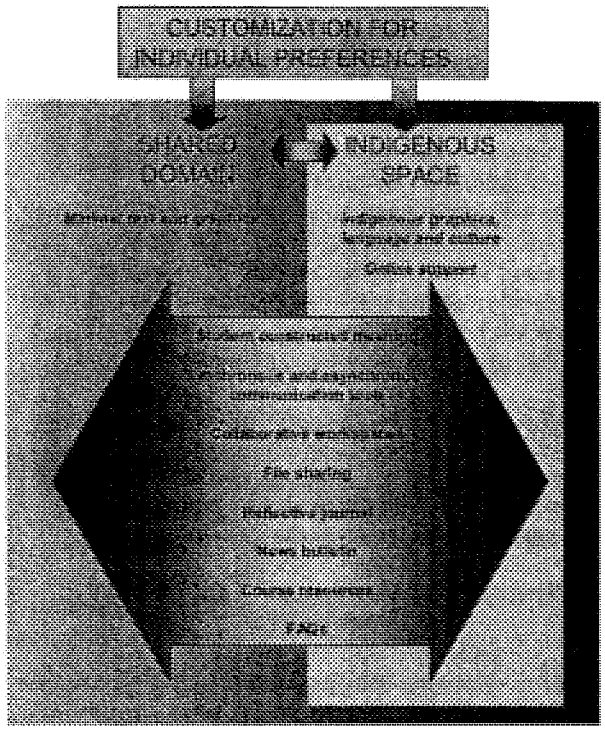

Fig. 1. Model for an Indigenous-Inclusive Online Learning Environment

students but nevertheless an integral part of the design, a space into which Indigenous students can come and go as they please.

C. *Customized Features For Individual Preferences And Learning Styles (Optional)*

If resources allowed, customization of both the shared domain and the Indigenous virtual space would be possible to allow for individual preferences and learning styles. Even when focusing on cultural inclusiveness, we need to remind ourselves that individuals do not always conform to group norms and what we are ultimately aiming for is the inclusiveness of individual students.

Customization via dialogue boxes, in which the user sets parameters for run-time configuration options, would allow for individualization of the online environment to suit specific users. Dialogue boxes and other controls for user selection, such as menus, can be static or dynamic: dynamic controls hide fields from the user depending on context and
past user preferences [13]. Highly sophisticated individualization of online environments is becoming increasingly feasible through intelligent agents, data mining, information filtering and other techniques [14]. These features are included in the model as optional since they obviously require an additional outlay of expenditure.

V. CONCLUSION

If the Faculty is to successfully pursue its program of opening up the field of IT to Indigenous Australians, existing online tools will have to be modified or replaced with facilities which more truly reflect the culture and learning requirements of these new students. This is no simple task: because of the many cultural backgrounds of our student body, it will not be sufficient to replace the current monocultural "western culture taken for granted" style with another style based on a single culture, whether Indigenous or otherwise [15].

Nor is it sufficient to opt for some culturally neutral approach. There is a large body of literature which argues that no technology is neutral, let alone IT. Instead of eliminating cultural bias, the role of the educator should be:

> proactive in seeking opportunities to increase the cultural relevance of instructional materials and to build upon cultural diversity and pluralism ... creating learning environments that are enriched by the unique values that are inherent in different cultures [16].

An online learning environment for Indigenous cultural inclusiveness will be one where the students' cultural perspectives will be accepted and celebrated, where they will construct their own meanings, share knowledge, learn in their own time, communicate and interact freely through many channels. Both the Indigenous online experience and the culturally inclusive online design models provide guidelines for creating this shared environment.

The difficulty of making any online site free of mainstream cultural bias will mean that customization is necessary. At a minimum this will entail the provision of an Indigenous-specific space, although if resources permit it could also include the building in of personalized customization features to allow for individual preferences and learning styles.

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