Chapter 5
Training for inclusion

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Abstract

There have been many programs initiated in Australia to train Aboriginal students for inclusion in the information technology (IT) sector. These range from Microsoft Unlimited Potential courses, which mainly focus on preparation for office work, to Online Analytical Processing games, which involve students in discovery learning about how computers function. We suggest this latter approach has much more useful ramifications for Indigenous people in terms of engaging them in employment and education. Years of research into Aboriginal and Torres Strait Islander education recommend that education in this sector should focus on practical, discovery learning with cultural and personal relevance, and stress the importance of identity within an Indigenous cultural context.

Introduction

The differences between Aboriginal and Western belief systems are many, and influence the knowledge that is valued and taught through each, as well as the way each teaches. For instance, we need to consider the significance of spiritual concerns and general wellbeing in learning, as well as the need for relevance to the learner and his or her culture (Kutay 2010). The approach to Indigenous learning should focus on practical discovery with opportunity for cultural and personal relevance in learning (e.g. Harris 1990; Nicholls et al. 1996). Another important element is the need for greater respect for the learner as knowledge holder. Such programs must acknowledge the learner’s existence within a social context, and his or her relation to the broader historical, social and political issues (Wall 2006).

Indigenous educational research recommends a focus on practical, discovery learning (Nakata 2002) with opportunity for cultural and personal relevance in learning (Harris 1990; Nicholls et al. 1996). Other research has focused on self and identity in learning, and how this greatly influences students’ outcomes (Mooney and Craven 2006; Willmot 2010).

IT provides an opportunity to develop online materials that support culturally relevant and personalised learning. However, little of this has been aimed at Indigenous users to date. One focus
of research into e-learning is to provide appropriate frameworks for learning that support educators in developing online learning courses. These frameworks make it easy to design learning environments and include learning materials, while retaining the flexibility for materials to be tailored to different learners, teachers and technology (for example, in how different users access the Internet). The federal Vocational Education and Training (VET) sector has designed the Flexible Learning Toolbox as a collection of online learning materials. This ‘toolbox’ approach provides a consistent, standard interface for experienced teachers to use as a framework for sharing their ideas on training. However, it is often used merely as a process of ‘putting lectures online’.

Indigenous toolboxes

VET Indigenous toolboxes tend to comprise individual Flash-based creations for each topic a course covers. They move away from the standard toolbox approach of supporting the mirrored learning resources across many courses, and instead focus more on materials of Indigenous cultural relevance.

An important aspect retained in the Indigenous toolboxes, however, is that they allow content to be gathered together in a way that allows learners to navigate materials in their own time and order, and to revise and make sense of material through their own learning processes. They also provide a vibrant interface for sharing multimedia learning examples, such as scenarios in Flash or video to support role playing and experiential learning. These toolboxes also include a teaching guide to support learning.

Relevant cultural content holds priority over the flexibility of being able to offer mirrored learning resources across courses, yet each toolbox normally deals with one theme or course. So in order to create similar courses using the same interface, but with content that is relevant to differing Indigenous peoples in different locations, the Flash system can be linked to a database and each set of material redeveloped for each new location or theme. An alternative approach would be to design more flexible Web 2.0 interfaces to the material, and this chapter considers this latter option.

Access to online material

Although our work focuses on web learning, we have found that many rural and semi-remote communities do not have access to the materials we are developing due to lack of affordable or public Internet connections. Also, many urban Indigenous households rely on Internet cafes for access. As is common across all areas of Indigenous affairs, we can never deal with one issue in isolation, and in this instance we cannot solve the issue of culturally appropriate learning if there is no access to the new digital tools that enable this.
Students are increasingly using mobile phones to access learning material, such as podcasts, and to provide feedback and discussion through mobile uploads (Dyson et al. 2009). In addition to mobile services, we recommend providing more opportunity for people in remote areas to collect and manipulate multimedia resources on computer. Although mobile services are ideal for the collection of information, the formation of knowledge and the linking of information to provide relevant contexts for learning require more substantial web access.

As well as involving remote communities in the collection of materials, we need to acknowledge that local knowledge is needed to transform this into learning materials. The bird posters in languages developed at Charles Darwin University (CDU 2010), which collect knowledge that identifies wildlife in regional Australian languages, are a good example of what can be done with resources. We envisage that such information could be collected online for other language groups, which would increase access for those users to the design, printing and distribution of such resources.

The Bundjalung people around Washpool National Park are the owners of knowledge about the rare flora and fauna of that area (of which there has been little documentation). We are keen to provide resources for the local school and community to be involved in a similar project, but presently there is little Internet access in this community, which lies only one-and-a-half hours by road from Grafton. We are working with the North Coast Computers Project, a project with Northern Rivers TAFE, to install e-hubs with training courses, and TAFE staff members are trying to obtain funding to extend local primary school access and enable access within the community.

**Sharing learning**

Although there has been much study of the learning preferences of Indigenous students, there has not been much guidance developed from this for their instructors. When developing materials for the engagement and immersion of Indigenous students, we have turned to an area of educational research called Problem Based Learning (PBL), which is designed to support Indigenous teaching and learning approaches.

Although developed for differing educational needs, the aims of PBL mesh with those of Indigenous learning (Kutay and Mooney 2008) — for instance, the emphasis on group work, the immersive nature of the learning and the learning structure through which knowledge is taught at different stages as students become ready to learn. As part of the process of integrating PBL and Indigenous Australian Studies, a website has been developed to collect resources for transformative teaching in Indigenous education. While focusing on Indigenous studies, this process of presenting alternative views and questioning established views could work across many disciplines.
Significant preparation is required to teach using a PBL method. PBL courses have been developed for school students and for use at universities (generally for professional courses), where it is acknowledged that students will face ‘problems’ in their careers. By developing sites such as the Indigenous Australian Studies site, we hope other teachers will share their ideas. These could be made available privately, with access granted only to registered members, or as a public resource. The authors often prefers private sharing of material, as many of these teaching materials are not highly self-explanatory and require background resources.

Many online groups are managed through email lists, shared sites and social networking software, but these are not familiar to many Indigenous Internet users. Yet resources such as these can be valuable for training. First, involvement in these networks provides a motivation for their members to learn about shared tools and, second, only those with a known interest in the identified common domain, and hence with some background experience of working in Indigenous education, will access the network. This provides for a website that is well trusted and allows more open sharing of resources.

Stories are knowledge repositories

To convey Aboriginal knowledge to non-Aboriginal students would be invalid without the contributions of Indigenous students and staff through the ‘translation’ of their experiences into this new intercultural context (Ramsey and Walker 2010). In particular, we need to reverse the present ‘systemic undervaluing of local knowledge and Aboriginal culture, a deeply ingrained unwillingness to “see” more sophisticated Aboriginal knowledge and processes’ (Yunkaporta 2009:105).

Battiste (2002) argues that animating the voices and experiences of Aboriginal people and integrating them into mainstream education creates a balanced centre from which to analyse European culture and learning. Therefore, we are using online teaching using storytelling (see also the Australian Learning & Teaching Council’s Indigenous Teaching at Australian Universities website). These narratives form an effective way to teach other students (Andrews et al. 2010; Blakesley 2010; Egan 1998) and respect traditional storytelling methods (Bradley 2010). Furthermore, Aboriginal students will be able to verify that their work is part of an ongoing course online. This is a way of acquiring students’ expert knowledge for teaching others, and it also holds benefits in validating their knowledge and identity (Mooney and Craven 2006; Willmot 2010).

Around Australia many people are developing cultural awareness training that is tailored to the needs of their communities. This covers a wide range of issues, experiences and priorities for learning. It is, in fact, this great variety of experiences that makes cultural awareness training so hard to define, as there is no ‘one’ Indigenous Australian culture. However, many people in the
Indigenous community hold vivid experiences that describe aspects of cross-cultural conflict or issues for cultural awareness that could be shared. The benefits of including more people in this training include enhanced respect for the storyteller and value for the cultural heritage of Australia.

A range of software services is now used for sharing knowledge online and for supporting the uploading and sharing of text, images and audio-visual material. We are redesigning one of these services to be used for sharing stories, preferably in audio and video formats. One website that we have designed is an online cultural training course, which illustrates such a framework for sharing stories (Kutay et al, 2011). The design of this story-sharing-for-learning web service is a meld of the Interactive Ochre National Vocational eLearning Strategy toolbox and a face-to-face workshop in cultural training. The live workshop was video recorded, and images from the workshop and other video segments were used to create the online interface. Experiential learning scenarios, similar to those available in the Interactive Ochre course, will be made available using a database of different people’s stories. When this database is well populated, a trainer can then select the stories relevant to the one they wish to present.

**Storytelling for learning**

The types of services and functionality that users have access to on websites are always changing, and the latest move is towards what are called Web 2.0 services. The purpose of developing a Web 2.0 style of interface is to allow many users to upload stories to provide a ‘community narrative’ on the issue to be studied. This approach to information gathering is cognate with the traditional storytelling of Aboriginal peoples (Attwood 1988; Magowan 2001).

Many people are sceptical of this approach and contend that conflict could arise from having multiple authors. Research into this issue suggests that these conflicts tend to arise when stories are gathered without recognition of variation in context, such as when stories from different locations and types of historical interaction with white settlers are combined as one experience of colonisation (Finlayson 1999; Minoru 2002).

Further, this process of collecting a group story, rather than simply publishing individual stories, is a necessary result of the cultural restrictions on people’s authority to tell a story. Following the traditional form of storytelling, Aboriginal people still acknowledge that you can only tell your own story, and not that of others. Even if you have heard a story, you need authority to speak for it before you can ‘tell’ it (Kutay and Ho 2009).

The power of this process is seen in the development of the story of the Stolen Generations. When children were removed from their families, the parents and children affected all had stories, and feelings of guilt and neglect. Social and geographical barriers prevented them from meeting to combine their stories, and it was only with the advent of the Link Up search network of family
records that their stories also linked up, and that the real historical reasons and consequences of this period in Australian history became known outside Aboriginal communities (Attwood 2001).

**Creating Web 2.0 training sites**

We have developed a cultural learning site for the Clarence River history (Kutay and Mundine 2010) and Kutay is working on a similar site for teaching kinship (Kutay et al, 2011). In developing a cross-cultural awareness tool for students and government workers, we are providing support for two types of learning. Aboriginal and non-Aboriginal students learn from different cultural materials and use these materials in quite different ways. We consider this training to be a two-step process that will use Indigenous students and staff to teach non-Indigenous students.

We have designed the initial interface for the cross-cultural training website. It is based on the original structure of a face-to-face workshop. In this format, Indigenous students are presented with an overview of their own culture, and how it works in the context of mainstream Australian society. At significant points in this framework students can add comments on how aspects of their cultures have affected their experiences of mainstream society.

Recording these experiences will form the group story in an audio, and possibly video, repository. Students can also hear other students’ experiences, and consider their common and distinct features. Contributing their stories also recognises the significance of each student’s experience as part of the group story, with each in the role of teacher to peers. This opportunity to teach is also an effective and efficient way for the students to acquire expert knowledge and understanding of a subject, rather than simply learning another’s interpretation (Grzega and Schöner 2008). The process of teaching necessitates that students construct their own ideas into coherent ‘stories’. Through the learning methods preferred by Aboriginal people, speaking a story can also form an experiential means of learning, and singing a traditional story is considered the ultimate way of knowing (Bradley 2010).

Previously, such exchanges of experiences have been on an informal basis at workshops, so it will be interesting if this process is transferred to the computer, thereby becoming part of a permanent record or repository. The authors of the stories in the repository will select the access level for their own contributions, and the context in which they are relevant within the workshop. A single user may fill the workshop with his or her stories, or may wish to simply add his or her own stories to others. The final site with these individual stories added then becomes the group story. Trainers can select the stories they feel are relevant to their particular presentation of the cultural issues from among those stories to which they have access.

The site with this selection of stories will be available as part of cross-cultural training workshops to tackle prejudice through education. Non-Indigenous students can use the interface in addition to the workshop, with stories linked to workshop themes. They will be exposed to ways in
which Indigenous cultures differ from their own culture, including areas where conflict has arisen and where harm has been caused through misunderstanding.

The stories that each student finds on the interface at each point during the workshop will depend on three functions. First, stories relevant to that theme and to the point being covered in the workshop are searched in the repository. Second, students select a ‘role’, such as taking an Aboriginal approach to the experiences, or a work area, such as ‘legal’. This will limit the items searched to match these ‘tags’. Third, they will undertake workshops under the instruction of an Indigenous trainer who has selected a subset of the stories considered most relevant. This learning process will provide students with some idea of the background of their future Indigenous clients, co-workers and friends, and why other people’s reactions to events may not be the same.

**Storytelling wiki**

Another approach to providing online learning resources is to use open-source wiki systems, like MediaWiki, that were specifically designed for sharing and linking information. We are modifying a wiki service to use audio and video content in a more accessible format for learning. As a first example of this, we designed a website for teaching the history of the Clarence River Area. This site (Kutay and Mundine 2010) is a resource for government workers to learn about the area, as well as for the community to share stories. Most importantly, much of the work going into the development of this site is to provide a resource that can be reused in many different contexts for story sharing.

[insert figure 1 about here]

**Figure 1: Virtual Campfire System showing separate components for multimedia handling.**

For more details see Cao et al. 2010 and video trailer

A similar system has been developed to share stories about locations destroyed in the Afghanistan War. Virtual Campfire (Cao et al. 2010) is a mashup of many services that provide a system of tools to link video, audio and text files (see Figure 1). A mashup is a collection of software services that are linked together. In this system the services allow users to create, search and share multimedia artefacts and connecting heterogeneous data sources. The basic component is called the Community Engine (Figure 1), which provides the web host and with which users can create separate communities for their projects on this server. For example, in one project, a three-dimensional map of a building destroyed by war is located on Google Earth, and tools are provided to link audio and video stories to locations on the model.

The Clarence River website has a similar aim. By annotating and downloading relevant segments of media, users can add text, audio and video comments linked to specific segments of the original text on the wiki site. For this application, we are using archival historical documents of
the area to provide the focus for the stories. The software tools developed for this website can be reused by a wiki site on another theme, and will provide the multimedia annotation and commenting tools required for this web service (Kutay and Ho 2010).

Searching for knowledge

Another mode of learning is through web searches. Much learning is now done this way via the Internet. The Internet is a mass of information that is hard for many people, particularly novice users, to evaluate and link into a coherent knowledge system. Toolboxes or interfaces that improve the coherency and comprehension of the results of such searches will help provide this context.

Existing search engines are highly text based, so we propose a project to develop a visual search interface for community knowledge sharing. Such IT projects using cultural information and providing relevance to Indigenous knowledge are designed to create an incentive for Indigenous entry into IT programs.

For the first implementation we are proposing, the visual means of searching is provided within the limited domain of government reports and policy relating to Aboriginal affairs. This will result in a limited semantic domain in which we create tags and tag relationships that can assist searches and allow collation of search data.

We also designed a visual interface to the search result. One approach is to use Google Instant Preview, which provides a button to view an image of the relevant page (GIP n.d.). However, this link information on the search result screen is not highly useful to many users. What is needed is a format that allows users to navigate through the search while maintaining a view of the entire search scope. The use of interactive graphical software is increasing on websites. This can be used to assist users follow links between related information obtained from web searches (see an existing commercial system in Figure 2).

We also want users to be able to further tag and annotate data to improve the linkage information on the visual displays. This will be in two forms. Users, particularly government and enterprise employees, can annotate a report, funding guideline or policy with information about the individual sections of the document, the location of the communities it applies to, and data on individual communities or regions.

The website is to be developed in line with the Government 2.0 proposal (Government 2.0 Taskforce 2009). Users will also be able to annotate reports and documents on the search site. This material will be retained in a repository as linking to the site. The sort of information users will tag might include audio recordings of how the report related to their community, or how they ran a
program under particular funding guidelines. It will build a repository of relevance of the text data to community process and experience.

At present, many government reports are not available on the Internet, or are hard to search. We believe that if communities and individuals develop an interest in accessing and using this data for more reasons than just applying for grants, government departments will be more interested in providing their reports and information online, and so will make a greater repository available for search and annotate functions. Unfortunately, the development of such systems is prone to stalling, as likely users will not be interested until many reports are available and annotated into thematic areas.

Engagement

One factor that we have had to face in our journey in designing and developing IT solutions for communities, organisations and users is that there are very few Indigenous people involved in developing computer resources. Although many of the issues confronting developers of appropriate Indigenous resources relate to novice users in general, there are specific foci and interests that are relevant only to these communities.

Many resources are available for viewing and sharing information online. Users or organisations can use mashups, like Middlespot,7 to draw together the most useful ones into a single website. However, this requires a depth of understanding and experience of the Internet that only comes from previous engagement. If what is on the web is mainly irrelevant, then people do not engage with it.

This is an issue of which comes first. Until people are engaged, they do not know what to ask of web developers. Websites remain static, semi-interactive and developed for one use only, and multimedia materials remain locked in isolated systems, often off the web.

Sharing knowledge is a traditional occupation, but it is a process that has been co-opted by the mainstream institutions and made so remote from Indigenous communities that it will be a slow process to rebuild trust, especially in such an open system as the web.

However, resources such as email lists, calendars, secure document sharing sites and, particularly, repositories are changing Indigenous uses of the web in that people are now seeing the web more as a place to contribute, and not just to read. Also, people are starting to find that information from the one source can come in many forms, like emails from a mailing list or download of blog updates. How do we involve more people in this development? In particular, how do we build resources for the experiential learning that is required to train expert developers?
Training for engagement

There is a need to provide relevant training that enables users to develop their own resources, starting at a basic level and building on that. The sort of training that supports this is based on using the technology in teaching. Flexible learning and the use of these resources throughout Indigenous TAFE and university courses are significant steps forward.

However, we need to extend these services to make more use of mobile access, such as through podcasts, and to engage Indigenous people wherever we can. Mobiles and the portable laptops being distributed by the One Laptop Per Child program in Australia provide an opportunity for children to collect and share audio and video recordings of their Elders and their country. By collecting these resources in secure repositories, the One Laptop Per Child program hopes to provide examples for users to share and learn more about the capabilities of computers.

One example of this is the work being done to provide Aboriginal language resources on the web. This has drawn a great response from users, who can now see a relevance to sharing knowledge in their aim to learn their own language. This can be simply a database to search language words, or tools to parse sentences and generate speech from text. These latter tools are not yet highly sophisticated, but their development with an Indigenous focus should be encouraged, as they provide a valuable resource to the language reclamation process.

Conclusion

The growing IT industry is not always considered relevant in Indigenous development issues, yet we have seen from our work with community organisations that almost all areas of research in IT relate to community concerns, either through the provision and sharing of information or through training.

These resources can be utilised by existing community organisations if funding is allocated for the tailoring of web services to Indigenous needs. At the same time, by introducing Indigenous protocols into computing design, we are sure to find interesting applications for these novel concepts in other situations.

It is important that Indigenous people are encouraged and trained in this area of employment to ensure that they are part of this information revolution, as well as to ensure that respect of Indigenous contributions to knowledge management and to our knowledge system is retained into the future.

Notes

1. See the North Coast Computers Project website at <www.nccpi.org/>.
5. Available at <http://dbis.rwth-aachen.de/cms/projects/virtualCampfire/virtualCampfire/vc_teaser%28large%29.mp4>
6. Available at <http://www.touchgraph.com>

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