INSTRUCTIONAL DESIGN FOR CULTURAL DIFFERENCE: A CASE STUDY OF THE INDIGENOUS ONLINE LEARNING IN A TERTIARY CONTEXT

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Abstract

Flexible delivery of educational resources must take account of cultural variables and recognise the specific learning needs, preferences and styles of learners. In designing instruction, there may be a tension between the need to ensure access for a multicultural student population, while at the same time taking into account the need for localisation to accommodate learners' cognitive styles and preferences. Considering the micro and macro cultural levels of instructional design is therefore essential if appropriate learning environments are to be created. The acceptance, use and impact of WWW sites is affected by the cultural perceptions, values, needs and preferences of learners (Chen, Mashadi & Ang, 1999).

One of the limitations in current instructional design models is that they do not fully contextualise the learning experience, and are themselves the products of particular cultures. The design of Web-based instruction is not culturally neutral, but instead is based on the particular epistemologies, learning theories and goal orientations of the designers themselves. Recently, theorists have argued for a cultural dimension in the design process and the need to provide culturally sensitive learning environments (Reeves & Reeves, 1997; Collis, 1999; McCahill, 1998).

In this paper, we trace the design processes involved in the development of an on-line unit for Indigenous Australian learners preparing to enter university, and account for the cultural issues that impacted on creation of learning tasks and styles of communication. The paper argues for cultural localisation, which means incorporating the values, styles of learning and cognitive preferences of the target population. It also means going beyond surface-level design considerations to achieve a meaningful constructivist learning environment. It is recommended that when creating WWW-based course support sites for maximum flexibility, systematic attention must be given to particular design guidelines, which include cultural contextualisation.

Keywords

instructional design, on-line learning, cultural contextualisation, situated cognition, cross-cultural

Cultural dimensions in the design process: recognising diversity

Culture pervades learning, and in designing instructional environments there needs to be serious debate about issues concerning the social and cultural dimensions of task design, communication channels and structuring of information if the needs of culturally diverse learners are to be met (Branch, 1997; Bork, 1990). Educational computing and the use of technology to mediate learning are imbued with cultural values and assumptions. At the micro-level of classroom culture, for example, research has shown that computer-based collaborative work can transform classroom cultures, the roles of teachers and the expectations of learners (Damarin, 1998; De Voogd, 1998).

Reeves & Reeves (1997) emphasise that greater challenges may arise when the core pedagogical values in one culture are culturally inappropriate in another, for example the expectation that students will question knowledge, or challenge the teacher's view. Despite the internationalisation of curricula, not enough is known about the ramifications of cultural inclusivity for cognitive design of learning resources and that further research is needed. Collis et al (1997) similarly conclude that there is little extant research on instructional design for cross-cultural Web site development.

Cultural aspects of WWW design

As learning is a cultural activity, the design of Web sites is infused with cultural meaning and with cultural nuances and identity issues, as instructional designers and developers bring their own viewpoints and perspectives into the design process. Collis & Remmers (1997) have defined two categories of sites that have cross-cultural implications:

1. Category 1: Sites that are made in one context and culture, but visited by other cultures

2. Category 2: Sites designed specifically for cross-cultural participation (See Figure 1.)

Figure 1: Categories of Web sites

Category 1 Web sites, for example, are made for a local context and culture and may not be culturally portable, as they are highly contextualised and embedded in the nuances and interaction styles of particular culture and serve the needs of a particular

audience. Category 2 sites are those which strive to reach a cross-cultural population, and serve the needs of an international audience. If category 2 sites are to be developed, there needs to be consideration of a range of instructional design issues so that cross -cultural participation and communication is made possible for all participants.

It has been argued that one of the essential foundations of student-centered learning environments is cultural inclusivity (Chen & Mashadi, 1998), with a focus on enabling learners to access learning resources in a manner that is congruent with their values, beliefs and styles of learning. Cultural aspects impinge on pedagogical and instructional design decisions, and cultural dimensions must be constantly probelematised and not marginalised. Joo (1999) suggests that the use of the Internet affects relations within the classroom and in the larger political arena, and promotes an independent exploratory view of learning. Distributed communities of inquiry are flourishing and are quite foreign to the centralized and hierarchical systems for knowledge distribution in many countries (Lauzon, 1999). At the micro and macro levels, the design of WWW instructional environments is imbued with cultural meanings and can influence modes of communication and styles of learning and participation.

Culture, constructivist learning and situated cognition

The use and application of technology can influence the micro culture of the classroom. Increasingly, technologies are being described as 'cognitive tools' which transform, augment and support cognitive engagement among learners at all ages. Crooks (1994) describes technology as a 'cultural amplifier' signifying that it transforms the nature of human productivity it can also quantitatively change the processes of cognition and amplify the cultural dimensions of communication, task analysis and problem solving. Similarly, Collins, Brown & Newman (1989) perceive learning as a situated achievement, incorporating cultural activity in a range of authentic settings.

Within the last ten years, the culture of teaching has also undergone transformation: teachers have been encouraged to plan more collaborative structures for learning, which have been shown to be effective in terms of learning outcomes (Crook, 1998). These pedagogies spring from a common source, constructivist learning theory (Duffy et al, 1993). Constructivism is characterized by a set of principles relating to how knowledge is created and how individuals develop understanding. Socio-cultural theory, for example, based on the work of Vygotsky (1978) emphasises that learning is a form of enculturation in which the individual is socalised through gradual participation in tasks, scaffolded or assisted by adults until full competence is attained. Another interpretation interpretation of constructivsm is situated cognition, based on the work of Lave & Wenger (1991) who maintain that learning is best achieved when it is encountered, used and applied in real world contexts. Situated cognition can be summarised as follows:

- Learning is situated and contextualised in action and everyday situations;
- Knowledge is acquired through active participation;

- Learning is a process of social action and engagement involving ways of thinking, doing and communicating;
- Learning can be assisted by experts or supportive others and through apprenticeship;
- Learning is a form of participation in social environments.

The 'community of inquiry approach' (Lipman, 1991) is based on similar constructivist principles: learning through apprenticeship, pursuit of common goals, shared inquiry and peer learning. The 'community of inquiry model' has been used as an epistemological framework to address the needs of culturally diverse learners (McLoughlin, 1999).

Is culturally pluralism possible in instructional design?

In order to design a culturally appropriate on-line unit of instruction, instructional designers need to follow design principles and instructional methods that best match constructivist principles. Instead of adopting a set of prescriptive theories, instructional designers need to ensure flexibility and to ensure that the content and tasks are designed to take the learners' perspectives into account. According to Scheel & Branch (1993: 8) 'instruction which acknowledges and incorporates cultural backgrounds regardless of subject matter domain, may be called culturally pluralistic instruction'.

There are many current instructional design models and paradigms, each of which can be interpreted as culturally and socially determined. Applied to design of instruction, theories contribute to cultural transmission (Flechsig, 1997). Instructional design models include cognitive, social and pedagogical issues, but may not acknowledge the need for cultural contextuality. Reeves & Reeves (1997, p. 63) for instance, outline a dozen pedagogical dimensions that can be used to design interactive multimedia tools and learning environments. Among these dimensions is cultural sensitivity, which is explained as follows: 'Web-based instruction should accommodate diverse ethnic and cultural backgrounds among the learners expected to use it'. Henderson (1996) has argued that instructional design is about the creation of cultural identity and cannot be culturally neutral. 'Instructional design cannot and does not exist outside of a consideration of culture' (Henderson, 1996, p. 86). How then, can the dimensions of cultural contextuality inform instructional design?

Design paradigms reflect world views

An important part of Henderson's (1996, 1994) work has been the identification of several design paradigms, each of which reflects particular world views, and consists of values, pedagogies, inclusions, and exclusions that results from the designers' own societal context. As instructional designers are instrumental in creating and developing interactive multimedia, courseware and learning environments, they can also influence material and symbolic culture. Among the paradigms identified by Henderson there are three identifiable approaches, all of which are limited with respect to cultural dimensions of learning and pedagogy (Table 1). These can be summarised as follows:

1. the inclusive or perspectives approach which imports the social, cultural and historical perspectives of minority groups, but does not challenge the dominant culture and is therefore cosmetic;

2. the inverted curriculum approach which attempts to design an instructional component from the minority perspective but fails to provide the learners with educationally valid experiences as it does not admit them into the mainstream culture;

3. the culturally unidimensional approach which excludes or denies cultural diversity and assumes that educational experiences are the same for minority students as they are for others.

Table 1: Existing ID paradigms and their limitations

Paradigm	**Definition**	**Limitations**
Inclusive or perspectives	• acknowledges multicultural realities, driven by equity and social justice	• soft multiculturalism • inclusion of the exotic • tokenism
Inverted curriculum approach	• conceptualises society as unequal • minority perspectives	• avoids cognitive needs • does not support equity in learning outcomes
Culturally unidimensional	• cultural minorities are invisible • culture is presented as homogenous	• dominant cultures only are acknowledged • culture is represented as peripheral

Henderson proposes a further instructional design model, which is a *multiple cultural model* of instructional design. This is characterised by a design approach which endorses multiple cultural realities or zones of development (Vygotsky, 1978). Essentially, this approach is a form of 'eclectic paradigm' which entails designing learning resources that allow variability and flexibility while enabling students to learn through interaction with materials that:

- reflect the multicultural realities of society;
- include multiple cultural ways of learning and teaching;
- promote equity of learning outcomes.

Application of the multiple cultural model requires a global or international perspective, as sensitivity to cultural difference and an appreciation of the numerous ways in which culture influences learning. Instructional designers would therefore have to consider the philosophical and pedagogical underpinning of goals, objectives, content and instructional activities, and incorporate not one, but multiple pedagogies, for example both instructivist and constructivist. The design should also be validated by a member of the minority group or groups to whom the learning materials are addressed, and materials would have to be tested with the target groups during the development phase.

The adoption of the multiple cultural model would require the design team to investigate the pedagogical dimensions of the cultures they are providing resources for, and be aware of the multiple ways in which each culture could interpret instruction. Some questions that would require answers are:

- What kind of learning environment is most familiar to the students?
- How does the cultural background of these students influence their use and view of time?
- How do students conceive the role of the teacher?
- What kind of relationship does students wants with a teacher?
- What kinds of assessment tasks will be fair and unbiased?
- What rewards and forms of feedback will be most motivating for these students?
- Is the locus of control congruent with these students' owns sense of personal control?
- What cognitive styles characterise the target group?

The Indigenous on-line project

Currently, the use of information technology by Indigenous Australians is very limited, and Aboriginal Australians are a minority group in higher education. Increased support for Indigenous use of communications technologies and an emphasis on the development of information literacy skills is part of current equity and access provision in Australian universities. In 1998 Edith Cowan University in Western Australia successfully obtained funding to launch its pre-university bridging courses on the World Wide Web to cater for Indigenous students wishing to undertake a pre tertiary course. The on-line learning environment and content were intended to enhance the participation of Indigenous learners in technology-based learning approaches, and to increase their academic success through increased proficiency and awareness of computer technology. Much extant research within Australia has signaled that the needs of Indigenous Australian are unique, and that mainstream cultural material designed for Anglo Australians are not pedagogically appropriate (Henderson, 1996; 1993; Byrnes, 1993)

In the context of designing an online unit on tertiary literacy for Indigenous learners, a pragmatic approach to culturally responsive design is proposed. This entails drawing on knowledge of cultural factors that influence learning and communication, and collaborating with Indigenous community members in the design process. This results in a process of design that minimises cultural misunderstanding, while promoting contructivist, contextualised, culturally responsive learning.

Ten design principles for culturally inclusive instructional design

1. Adopt an **epistemology** that is consistent with, and supportive of constructivst learning and multiple perspectives. For Indigenous Australian students, becoming bicultural is part of their adaptation to learning in tertiary study, and a prerequisite for academic success. Many approaches to the education of Indigenous students have been labeled reductionism or based on a deficit model,

which assumes that Aboriginal students enter universities without the requisite skills and have to be remediated into mainstream tertiary settings. This deficit view is destructive and denies learner input. The adoption of the 'community of practice model' for online delivery (Lave & Wenger, 1991) enables learners to have access to community knowledge, support structures and shared interests. This form of emancipatory pedagogy ensures recognition of students' capacity to construct their own knowledge, bring prior experience and culturally preferred ways of knowing to the task and develop a sense of ownership and pride in their own knowledge.

2. Design **authentic learning activities**. In adult education, instructional design of educational programs must build on the existing skills and values of the community, its cultural traditions, problems and issues in order to create a unified and authentic learning environment. Subject matter that is relevant, engaging and contextualised must be taught. In Australia and North America, research conducted with Indigenous adults shows that purely cognitive approaches to design of learning resources have had limited success, while interactive, dialogic approaches which involve community interests and needs have been found to motivate Indigenous students to develop the analytic and verbal skills they need to succeed in the contemporary world (Ryan, 1992; McCarthy et al, 1991).

3. Create **flexible tasks and tools for knowledge sharing.** One of the basic principles of instructional design is that learners should be able to share what they have constructed with others. This reinforces the social dimension of learning and creates an on-line community (Selinger, 1998). For Indigenous learners, sharing and communication reinforces a sense of community and relatedness.

4. Ensure **different forms of support, within and outside the community.** One of the principles of the community of practice is that there is scaffolding for novices until they develop competence. In an on-line community, similar structures can be provided to learners through web-based tools. Tutors engage with students in dialogue though discussion forums, and can provide examples of the structures and processes that are required in tasks. Models and ideas from other tertiary students are additional resources that student can access, and bulletin boards give students the opportunity to engage in guided reflective discussion with a tutor. (Figure 1 is the on-line 'help desk' feature in *Learning Pathways*, providing multiple forms of learner support.)

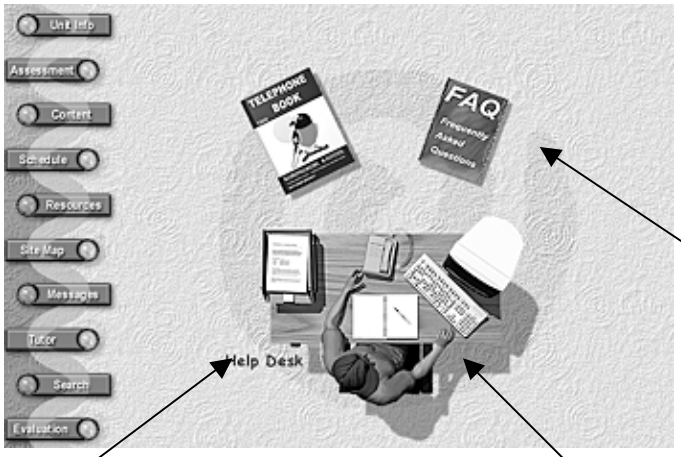

Figure 1: The on-line help desk offering multiple forms of scaffolding

5. Establish flexible and **responsive student roles and responsibilities.** From the outset, awareness of student needs should inform the design process. For many students, initiation into an on-line community may be a new experience and therefore technology-related skills will need to be learnt. Clear communication of learning outcomes can be established through design of the Web site, with navigation tools to allow multi-layered exploration of the unit requirements, assessment tasks and learning activities. Learners need to know what is expected of them and to feel a sense of participation.

6. Provide **communication tools and social interaction** for learners to co-construct knowledge. Learners can utilise multiple modes of communication with tutors and with other learners. Through the use of bulletin boards, ideas can be shared and topics discussed prior to presentation. In *Learning Pathways*, social interaction is fostered through a 'Yarning Place' where new topics can be raised and personal interests explored. Figure 2 shows the 'yarning place' bulletin board.

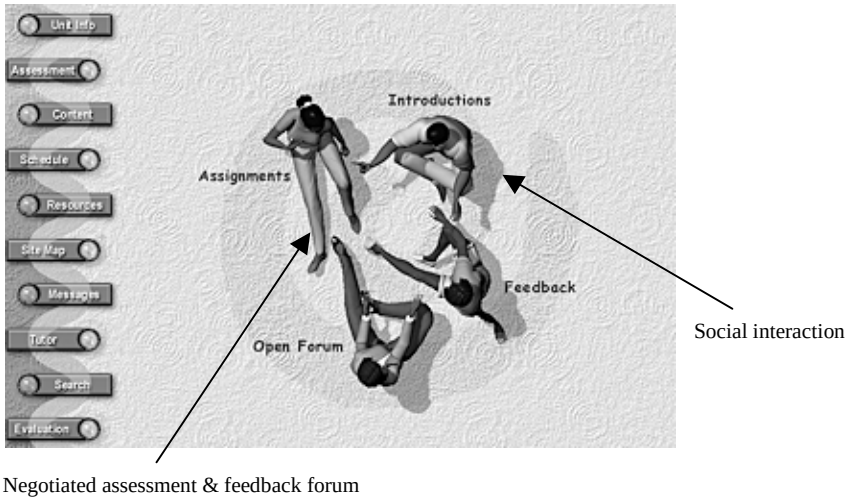

Figure 2: The yarning place bulletin board

7. Create **tasks for self-direction**, ownership and **collaboration.** For Indigenous community members a sense of place is critical to identify and belonging. In the academic unit of study *Learning Pathways* described here, students have to create their own sense of progress and decide on a learning path that would lead them to successful completion of the unit. Various features and choices are presented, and a reflective space (an online journal) is provided to enable students to reflect on decisions taken and to alter their course of action if they wanted to. Shared workspaces are also provided for distributed groups of students working on projects. In addition, students are encouraged to explore the wider learning space of the Web by searching for URL's and resources to augment the ones provided. In this way, affirmation of learner contribution to the online design was realised.

8. Ensure **flexible tutoring and mentoring roles that are responsive to learner needs**. If students are studying online for the first time, the need for dialogue and direction may be great at the initial stages of the course. Roles of tutors need to be interchangeable and modifiable in the light of student feedback. In *Learning Pathways*, this flexibility is ensured through the help desk and online forums that provide learners with rapid feedback and scaffolding.

9. Create **access to varied resources to ensure multiple perspectives**. This can be achieved by moving away from instructivist approaches where all texts are prescribed to constructive approaches where learners actively add to the resources by posting new URL's, suggesting additional resources of interest and discussing alternative resources through the bulletin boards. For Indigenous learners the creation and inclusion of the Indigenous perspectives is an important dimension and a means of affirming and integrating cultural knowledge.

10. Provide **flexibility in learning goals, outcomes and modes of assessment**. The WWW can support flexibility in many forms, and learners should have control over their own learning goals, the topics they choose to research and the pace and sequence in which they access the resources. For the Indigenous learners accessing the online units these were essential requirements, as many were mature age learners with different life experiences. By offering choice and self-direction learners could choose which mode of assessment best suited their circumstances and learning style.

Table 2 provides a summary of the design guidelines and features of the online unit for Indigenous Australian learners.

Table 2: Design Guidelines for flexible and culturally responsive Web design

Cognitive/cultural issue	**Instructional Design consideration**
• Awareness of learner needs and preferences	Design instruction and learning tasks that support differences in learning style and language

• Communication and social interaction	Create multiple channel and forums for communication between learners and tutors
• Authentic task design	Plan learning activities build on diversity and provide bridges to the students' culture and community
• Multiple persectives and access to resources	Enable learners to create resources and to add culturally relevant sources of information. Emphasise learner input.
• Scaffolding and support	Create scaffolding or support structures to ensure that learners develop skills & confidence. Peer scaffolding can be included.
• Flexibility in goals, modes of assessment and learning outcomes	Ensure flexibility and inclusivity by offering choice, multiple modes of delivery and assessment. Students should be able to choose their own pathways through the content, negotiate task for assessment
• Tutor roles	Create multiple roles for online tutors and mentors at various stages of the course to ensure feedback and support
• Collaboration and co-construction	Design motivating tasks where learners can share ideas and work on projects, drawing on cultural resources
• Clear communication of aims, obecjtives and requirements	Plan for maximum clarity and ease of use, while designing for choice. Avoid assumptions about cultural stereotypes and expectations
• Self-direction and integration of skills	Foster self-direction through design of tasks and resources so that information literacy skills are integrated into students' and lifelong learning strategies.

Conclusion and implications for practice

The rationale for considering culture as a dimension of effective WWW instruction is simple: it enables learners to develop a cognitive anchor for new knowledge and allows them to relate and integrate new concepts within a coherent perspective that recognises diversity. The starting point for instructional designers is the epistemology of constructivist theories of learning. By adopting constructivist theory, designers acknowledge that learning is socially-grounded and located within communities with particular cultures, values and expectations. By applying constructivist theory such as situated cognition or cognitive apprenticeship (Brown, 1997; Collins, Brown & Newman, 1989) instructional designers can plan activities where learning is a process of participation, communication and co-construction of knowledge. There is abundant literature showing that cultures have identifiable dimensions, goals, expectations and that variations in learning styles, modes of communication and participation impact on learning (Stoney & Wild, 1998; Wild & Henderson, 1997; McDonald, 1993).

By creating a learning community on-line with supportive contexts, access to resources and negotiable outcomes for maximum flexibility, instructional designers can begin to move beyond the narrowly prescriptive boundaries of current ID models. A culturally informed model of instructional design that plans for diversity, flexibility, interactivity and interconnectivity recognises the social and cultural dimensions of constructed meaning and meets the needs of a diverse student populations.

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