Providing cultural context with educational multimedia in the South Pacific

Christopher Robbins
Rhode Island School of Design, 2 College Street #1375, Providence, RI 02906 USA
crobbins@risd.edu

ABSTRACT

A recent research and development project conducted at the University of the South Pacific (USP) examined how educational multimedia can be built according to the learning approaches of the region. Through interviews, questionnaires and usability tests with staff and students at USP, the research team drafted a set of recommendations for the development of educational multimedia in the region. They then built an interactive CD-rom based on these recommendations. This paper focuses on the results related to cultural context, and the directions they indicate for educational multimedia developers in the South Pacific. Specifically, the study found that Distance and Flexible Learning (DFL) materials do not generally provide the cultural context that staff and students desire at USP, as they rarely utilize local metaphors, examples or Vernacular language. The paper presents approaches developed during the project to provide cultural context in two categories: decentralised and dialogic contextualisation. Through decentralised contextualization tools such as a Wiki or digital scrapbook, students are encouraged to provide their own cultural context to the learning materials. Dialogic contextualisation tools such as virtual peers and interactive quizzes can provide cultural context in a more conversational, personified, and centralised manner. These ideas are illustrated with specific examples of educational multimedia projects, so that they can be easily replicated and modified by educational multimedia developers in their own contexts.

Keywords

Cultural pedagogy, Educational multimedia, South Pacific, Distance learning, Contextual learning

Introduction

As a regional University serving 12 island nations scattered over 33 million square kilometres of ocean, the University of the South Pacific (USP) teaches to a widely distributed region with a variety of cultures. Consequently, students' coursework is often divorced from their own home cultures (Thaman, 2000a). Many lecturers and course books come from abroad, English is a second language (or third, or fourth) for most students, and the formal educational system itself was imported from another part of the world (Matthewson, 1994; Thaman, 2003a; Wah, 1997). Bridging this gap between the culture of largely imported educational institutions and the cultures of their students has been a major focus for Pacific educationalists (Lockwood et al., 1998; Thaman, 1997; Va'a, 1997, 2000; Wah, 1997).

In a recent research and development project, the USP Media Centre explored how educational multimedia can help bridge this cultural gap. Through questionnaires, interviews, and usability tests with students from the twelve member nations of USP (Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu), and a review of regional academic literature, the research team mapped learning approaches of students in the South Pacific to the development of educational multimedia in the region. Key aspects of regional learning approaches raised during this process include modeling (Jordon et al, 1981 in Taufe'ulungaki, 2000; Thaman 1999; Va'a, 1997), trial and error (Mel, 2001), vernacular language (Pagram et al., 2000; Taafaki, 2001; Taufe'ulungaki, 2000), preserving the whole (Harris, 1992; Thaman, 1992; Yorston, 2002), increasing complexity through successive approximations (Harris, 1992), and cultural context (Okamura & Higa, 2000; Taufe'ulungaki, 2000). Based on these findings, the research team drafted a set of recommendations for the development of educational multimedia in the region, and built an interactive CD-ROM that applied these recommendations.

The first section of this paper discusses the importance of contextual learning in the South Pacific, as examined through interviews with staff and students, and a review of regional academic literature. In general, staff and students complained that as textbooks and other learning materials provided were developed for staff and students in other countries, they rarely used examples and metaphors from their own cultures. These findings are in line with established literature on education in the South Pacific. However, ramifications for educational multimedia development are still only beginning to be analysed in the USP region, so the second section illustrates several methods for the development of educational multimedia that can help provide this cultural context. In the absence of culturally relevant educational material, staff and students have come up with their own methods to create cultural context at USP. The second section analyses how these methods and lessons-learned can be applied to educational multimedia. Specifically, *decentralised* methods that enable students and teachers to customise educational multimedia themselves, and *dialogic* methods that provide local context

through conversation-like interfaces, are demonstrated. These educational tools include a virtual peer, wiki, self-test, digital scrapbook, and three-tier file structure.

Although all of these methods were developed for students from cultures in the South Pacific, their flexible nature means that they can be useful in many other parts of the world. The underlying principle of providing easily adapted multimedia for use with diverse cultures and languages remains valid in a variety of cultures and situations.

Method

Participants

The research team collected data through interviews, questionnaires and usability tests with over 200 staff and students at USP. Since the research team was unable to visit all twelve countries served by USP, countries visited were selected to provide an even sample geographically and technologically. One Distance and Flexible Learning (DFL) centre was visited from each major geographic region in the South Pacific (Micronesia, Melanesia, and Polynesia) as well as one less developed and one more developed DFL centre. As such, DFL centres visited included those in Nauru, Samoa, the Solomon Islands, Kiribati, the Marshall Islands and Fiji. Interviews were conducted via telephone and email with staff and students from the remaining six countries served by the University of the South Pacific: Cooks Islands, Niue, Tokelau, Tonga, Tuvalu and Vanuatu. It is important to note that as questionnaires, usability tests, and interviews were conducted at the DFL centres, the sample did not include more isolated students who were unable to visit the DFL centres during the study.

Procedure

Interviews

153 interviews were completed during the course of the project. 130 of the interviews were with staff and students at the University of the South Pacific, and 23 were with members of external organizations in the South Pacific. These included ICT/Multimedia organizations such as Telecom Services Kiribati Limited (TSKL Kiribati), Datec, Internet Fiji, Aptech and Connect; development organizations such as the United Nations Development Programme (UNDP), the Forum Secretariat, and Peace Corps; government departments such as the Fiji Broadcasting Commission, the Fiji Ministry of Education, and the Nauru Ministry of Education; and educational institutions such as Central Queensland University, Nauru College, and the College of the Marshall Islands. The interviews focused on preferred approaches to learning and technology. The major themes covered included communication between staff and students, language preferences and issues, local metaphors in teaching, active learning, group/peer learning, computer access/usage, and centre access/usage. The individual interviews were supplemented by focus groups with academic staff. Notes and transcripts of the interviews are available online at the project website: http://nm.grographics.com, and links to notes for the interviews referenced in this paper are listed individually in appendix 1.

Questionnaires

The interviews were augmented with (and often jumpstarted by) three questionnaires. 196 focused on language preference, 196 focused on preference for the display of information, and 154 focused on layout preference for web-page navigation.

Usability tests

28 students conducted usability tests on sample educational software. The goal of these tests was to see how students work with educational multimedia, looking for trends in approach to the interface, common problems encountered, and methods used to solve these problems.

Results and Discussion

The importance of cultural context to staff and students in the South Pacific

Cultural context is an incredibly important aspect of learning in the South Pacific (Pagram et al., 2000; Taufe'ulungaki, 2003; Thaman, 1992, 2003a; Va'a, 1997). Traditional educational hierarchies in most member-

countries of USP require that learning be grounded in the needs and context of indigenous culture before the learner is considered to have attained a high degree of knowledge (Ene, 2003; Lima, 2003; Mokoroa, 2003; Nabobo, 2003; Teaero, 2003; Thaman, 2003a).

On a purely practical level, students perform better when concepts are explained in terms of their personal experience (Okamura & Higa, 2000; Taufe'ulungaki, 2000). However, much of the educational material at USP makes use of examples and metaphors from Europe, North America or Australia (Henderson, 1993, 1996 in McLoughlin & Oliver, 2000; Thaman, 2000a).

Thus, the task of using local examples in many cases falls to the teacher. For example, Konai Thaman (2000b) attributes the high pass rate of her Educational Theories and Ideas course to the highly contextualised nature of the teaching and learning, as she has adapted the curriculum to reflect Indigenous educational ideas such as those of Kiribati, Tonga and Fiji.

During this study's interviews, a tutor in the Solomon Islands' DFL centre spoke of his students' difficulties with Australian textbooks filled with Australian examples, and offered the advice, "try to use a local example" (appendix 1:NmSolomons). The program assistant at the same centre echoed these sentiments,

> "It would be good to go through the courses to see where a regional example can be used, for each course, and truly go outside when we cannot find a regional example." (appendix 1:NmSolomons)

He went on to explain that even regional examples can sometimes be isolating:

> "Some of the course writers only use examples from the countries they know. If you look at sourcebooks, most use examples from Fiji and Samoa." (appendix 1:NmSolomons)

Staff at the Nauru centre also expressed the need for truly local examples:

> "The exam paper had to do with Kava [a drink popular in much of Polynesia and Melanesia]. It was like double-dutch to us." (appendix 1:NmNauru)

> "Most of the examples are very Fijian. We don't have veggy markets. We don't have military management. I have to pick something we can identify with." (appendix 1:NmNauru)

In the Solomon Islands, the chemistry tutor uses the local practice of chewing betelnut to teach about acids, bases and the chemical reactions of calcium oxide, lime and water (appendix 1:NmSolomons). In Kiribati, a computer science tutor uses the main atoll's one road to illustrate the concept of bit-rate and bandwidth: "here we have one lane, but get them to imagine we have several." (appendix 1:NmKiribati).

Lecturers also use local metaphors for more general tasks, such as course management. A lecturer at the USP Laucala Bay campus helps students see the inter-relatedness of the individual components of the larger course as a whole by describing the individual sections of the course as the strands of the *Sasa* broom, bound together to form a whole. She solidifies the idea that the components are all important to the whole with the aphorism "when you are a coconut, every part is useful." (appendix 1:NmSporeBrainstorm)

She also calls on the region's culture of story telling, illustrating different parts of the course with symbolic imagery:

> "On day one of the course the lecturer tells the story of the whole course, with pictures… and we are always going back to the map-story/conceptual map… relating it to a symbol"
> A lecturer at USP Laucala bay Campus
> (appendix 1:NmSporeBrainstorm)

During the interviews, students also spoke of the importance of cultural references. A management student at the Nauru DFL centre said that the course materials generally made sense, but that local tutors usually had to change the examples "on the fly" to make them applicable to the local situation. (appendix 1: NmNauru). Likewise, in discussing the importance of traditional education within institutional educational systems, a student at the Kiribati centre commented, "learning has been since our forefathers; it's only the system that has changed… most of our learning is related back to our culture." (appendix 1: NmKiribati) When a Samoan student studying

Agriculture was asked what he most wanted from educational multimedia, he responded "regional info, Pacific info." (appendix 1:NmSamoa)

As a USP student noted in an earlier study,

> "I try to relate it [assigned reading at USP] to my background because most of the work is not on the Pacific"
> (Landbeck and Mugler, 1994, p. 29)

In summary, staff and students throughout USP's 12 member-nations see a need for more local metaphors in their coursework, and often have to provide this cultural context themselves. Although this need has already been well documented in the regional literature already discussed, analysis of the role of educational multimedia in providing cultural context is still in relative infancy in the region. As such, the following section explores how educational multimedia developers specifically can provide opportunities for this context, illustrated with prototype products developed during the project.

Providing cultural context with educational multimedia

It is helpful to consider two methods for providing cultural context when developing educational multimedia: *decentralised* and *dialogic* contextualisation.

Decentralised contextualisation

Due to the large number of countries and distinct cultures that educational multimedia must serve at USP, providing truly local illustrations for every concept would be incredibly difficult to achieve. Educational multimedia developers can, however, give each country its turn, and anchor the regional examples to the student's own background by giving the student a chance to provide input. Decentralised contextualisation refers to designing educational multimedia so that teachers and students can provide cultural context themselves, rather than relying exclusively on the multimedia developer.

Dialogic contextualisation

Dialogic contextualisation refers to framing educational multimedia interactions as conversations or personified interactions that provide cultural context. In Australia, "dialogic" interactive approaches that mimic conversation have helped motivate indigenous learners by linking their learning to their own community interests and needs (Ryan, 1992 & McCarthy et al, 1991 in McCloughlin & Oliver, 1999). Thaman (2000b) focuses her student's studies of educational theories and ideas on the people associated with them because she has "found Pacific island students to be more people-oriented compared to other students." In general, much of the literature on education in the South Pacific concludes that learners in the South Pacific are generally people-focused (Landbeck and Mugler, 1999 in Thaman, 2000a; Mokoroa, 2003; Pagram et. al, 2000).

Discussion Boards and Wikis

Discussion boards and "Wikis," collaborative web sites that can be edited by any viewer, provide a decentralised method for contextualisation, making almost all of the content-development the user's responsibility. The term "Wiki" is derived from the Hawaiian "Wiki-Wiki ," meaning "quick" (Cunnigham, 2003). As such, a Wiki is meant to be a quick and easy way for non-technical users to create websites together.

Like the electronic discussion board, the Wiki enables staff and students to ask questions and give feedback when they are physically isolated from fellow students and lecturers. A key difference is that while in a discussion board users add comments progressively, in a Wiki users can edit each other's content. This allows students and teachers to hone content into a single, collaborative website, facilitating a more structured result than discussion boards. It is an approach more in line with consensus than debate, closer to traditionally Pacific approaches to decision-making (Taufe'ulungaki, 2003; Teaero, 2003). As part of the project, the research team created an open "USPWiki" (figure 1) for testing and feedback, which can be viewed and edited at http://www.uspwiki.grographics.com.

An added benefit of these electronic means of peer learning is that they provide a perceived cushion of "e-anonymity" in social situations. Many students unwilling to ask questions of their lecturers in person, video

conference or audio conference feel at ease emailing questions or using electronic discussion boards. (Appendix 1:NmMarshalls; Hunter, 2003) As a Math/Education student at the Kiribati centre put it, "for us it is better to email because it is not face to face" (appendix 1:NmKiribati). Of course, this does not advocate the use of technology as a way of avoiding interpersonal contact, but suggests that technology be developed that releases social unease rather than exaggerate it. This is particularly relevant in cultures where young people do not generally question authority figures (Nabobo, 2003; Reeves & Reeves, 1997 in McLoughlin & Oliver, 2000; Taufe'ulungaki, 2000; Teaero, 2003).

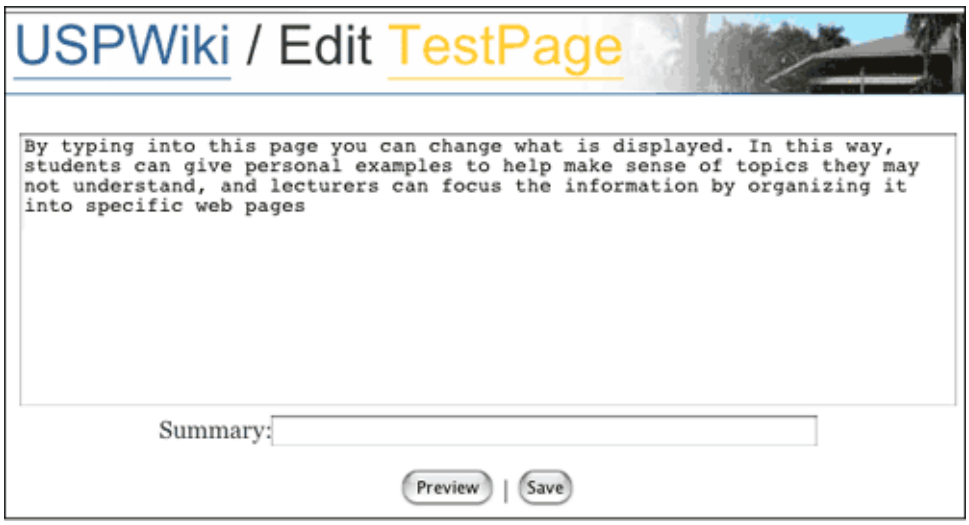

Figure 1: A page for editing the "USPWiki"

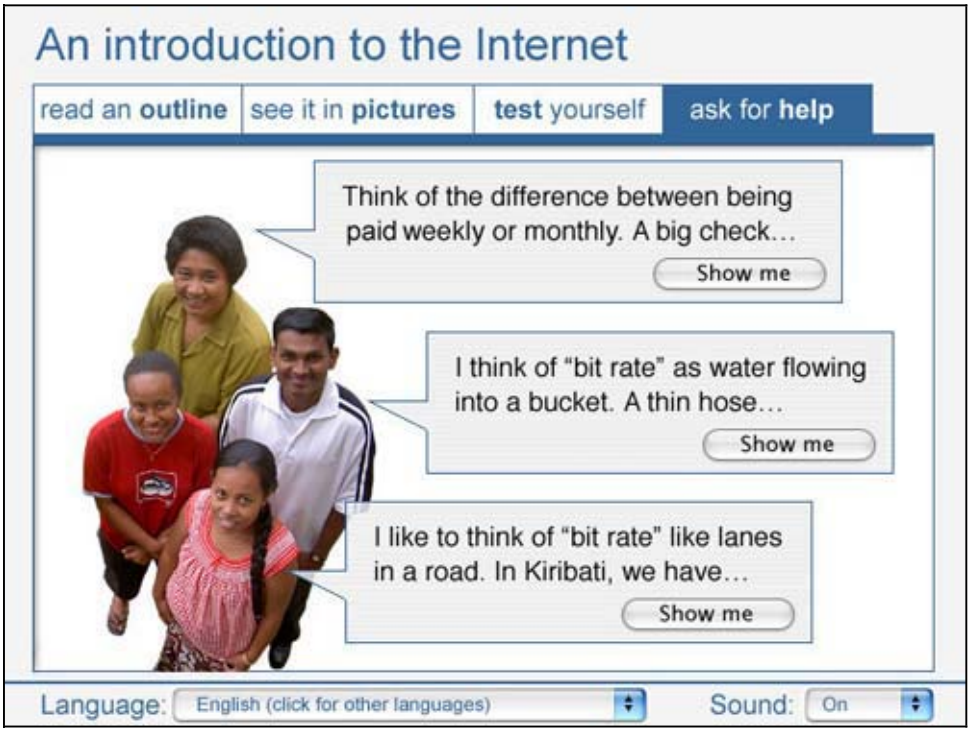

Figure 2: Virtual peers describe concepts in local terms

Limitations of Wiki and discussion boards

As many students in the South Pacific have little or no access to the internet (Frank, 2002; Landbeck and Mugler, 2000; Primo, 2001; Tuimaleali'ifano, 1999), it is important that educational technology developers also consider solutions not reliant on the Internet. Additionally, in order to mimic the role of modeling in Education in the South Pacific (Jordon et al, 1981 in Taufe'ulungaki, 2000; Thaman 1999; Va'a, 1997) the unstructured,

unscaffolded aspects of the Wiki would need to be modified for use at USP. Moreover, Wiki, discussion board, and email are primarily text-based communications, which can alienate some students (Okamura and Higa, 2000). Multimedia has the potential for much more than text-based communication of ideas. As a DFL staff member at the Laucala Bay Campus pointed out,

> "Computer alleviates the 'loneliness of books' because it is interactive, like a person, has images and sounds, helps communicate with people"
> (Appendix 1:NmFiji).

Virtual Peer

A "virtual-peer" provides cultural context in a less text-intensive and internet-reliant way than email, Wiki, or discussion boards. By combining decentralized and dialogic contextualization methods, the "virtual-peer" allows the student to be engaged in conversation with fellow students from different parts of the South Pacific. Each student discusses the lesson in terms from his or her own country, illustrating his or her examples with animations, illustrations or audio clips (figure 2).

Decentralised aspects are utilized when the student is asked to discuss examples from his or her own culture, as in Figure 3. By saving the student's own examples on the computer, the software's library of contextualised learning metaphors can be built in a decentralised and personalised manner.

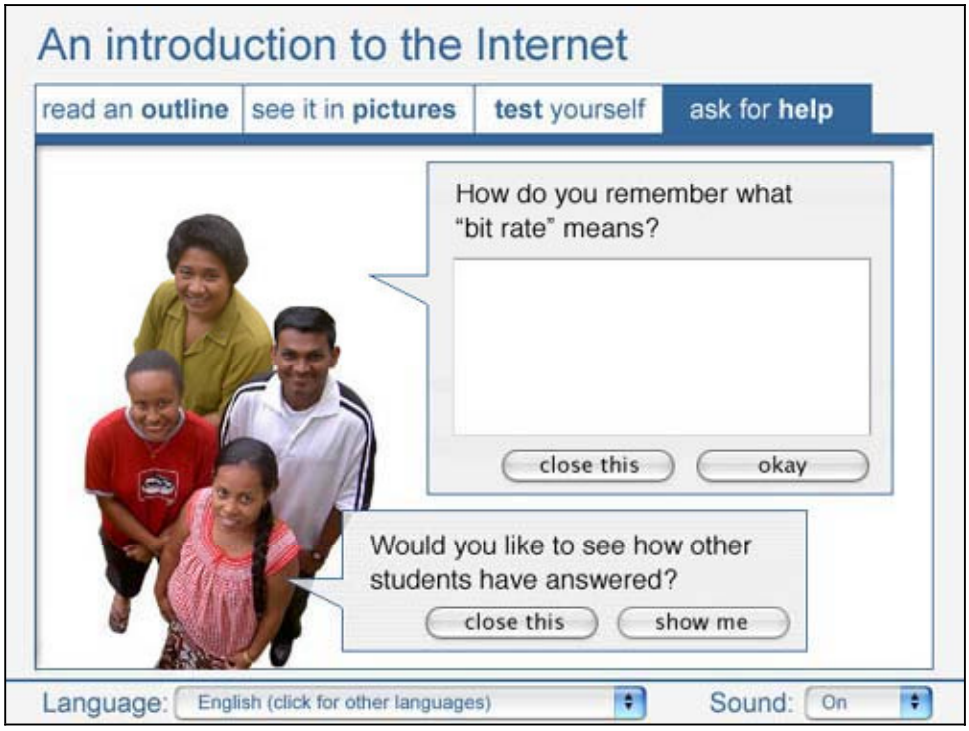

Figure 3: Students are asked to make their own metaphors

The digital scrapbook

When staff and students spoke of the aspects of collaborative learning they appreciated, the opportunity to share ideas came up frequently. A common thread through these conversations was the chance to translate what they were learning to their own situations and language, or as Mel (2001, p. 66) puts it, "local participation in making and realising the world." During the Solomon Island DFL Centre visit, Jerry Pakivai, a computer teacher, came upon an idea that can enable students to actively alter their learning materials to make them more applicable to their local context and learning needs: the digital scrapbook (appendix 1:NmSolomons). A digital scrapbook (figure 4) would allow students to copy portions of text, images and video, add their own information or summaries, trade their creations with other students and save them for individual study. By mixing a degree of constructive learning with passive materials, the electronic scrapbook caters to different types of students. Making the scrapbook printable enables it to be used at the student's home or when the electricity (often inevitably) goes out. While making educational materials printable may seem obvious, the dynamic and

interactive nature of much multimedia can often make it difficult to print, so extra attention must be given to maintain sensible static versions alongside animated and dynamic media.

Figure 4: Digital scrapbook integrated into an educational multimedia program

A three-tier "Mothership" approach to file structure (figure 5), in which supporting files (text, images, video, audio) are separated from the core multimedia software, extends the digital scrapbook idea further by allowing the student's assembly to go on outside of the educational multimedia program.

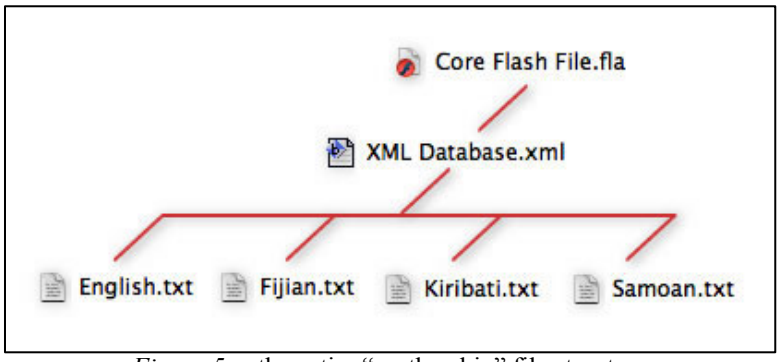

Figure 5: a three-tier "mothership" file structure

If every image, video, text and audio file is saved separately, students can view and reassemble many media assets without ever opening the educational multimedia program itself. Direct access to the individual components of a multimedia project is useful for students with older computers incapable of running high-end multimedia, or who prefer to use the operating system's built-in file navigation methods (opening documents in folders, etc.). Providing the supporting media separate from the educational multimedia has the additional benefit of encouraging re-use in other projects. For instance, course book creators could use the text portions in their print-based materials, tutors could use the images for their in-class presentations, and local radio stations could broadcast the audio files, all without ever opening the multimedia application itself.

Test yourself

Interactive quizzes can also provide cultural context if they are conceived more as a dialogue between student and peer than as an assessment method. In figure 6, the questions are worded such that the correct response can usually be derived from the question itself. In this way, the "test yourself" option is designed to strengthen

conceptual links, helping students anchor what they are learning to something they already know or can intuitively understand. When a student responds incorrectly, the peer offers a hint and encourages the student to try again. In this way, the "test" mimics interpersonal dialogue, and encourages learning through trial and error. The "test yourself" is really a vehicle to give examination-driven students something to hold onto, providing cultural context by explaining the proper solution in terms of the students' own culture. Although the form (a test with hints) is familiar, the content's and goals differ from typical interactive quizzes, in that they are not assessment methods, but self-standing teaching tools that link coursework with stories from the student's background.

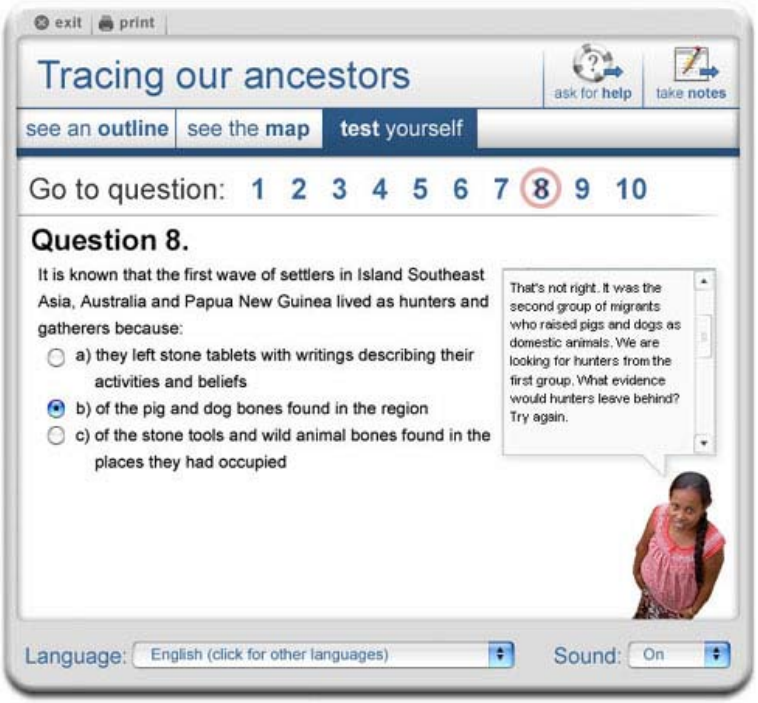

Figure 6: 'Test yourself"

Conclusion

The University of the South Pacific serves many cultures through its distance-learning program. Although staff and students at USP indicated a need for learning material situated in their own cultures, much of the educational material being provided is homogenous, and uses predominantly "western" metaphors and contexts.

The need for cultural context in formal education is also well documented by existing regional research, yet educational technology in the region is still largely developed using "western" learning constructs, tools, metaphors and examples. Developing cultural context from foreign educational materials has been an important aspect of teaching and learning in the South Pacific, and this study has built on the accomplishments and ideas of teachers and students by applying them to educational multimedia. This project developed multimedia solutions that can provide regional context, introducing a level of customisation and empowerment to the individual student and teacher.

Methods that educational multimedia developers can use to provide this missing cultural context were divided into *decentralised* and *dialogic* contextualisation. An important concept that bridges these approaches is encouraging teachers and students to customise educational multimedia themselves. This can be achieved by creating conversation-like interfaces such as the Wiki, virtual peer and self-test that use the back and forth between students and teachers to create truly relevant material. Customisation can also be encouraged by building software in easily editable formats, incorporating digital scrapbooks or organising media in three-tier structures so that individual files can be viewed, edited and re-used in isolation from the complete multimedia application.

It is important to keep in mind that locally-developed and culturally-contextualised multimedia is new to the USP region. Although regional teaching methods have been in use for centuries, and although teachers in the region have had to customise foreign learning materials for decades, concerns over how these methods and goals apply to educational technology are still in their infancy. As such, while there is a broad body of research on regional teaching and learning methods and concerns, links to technology are newer and more tentative. In this study, technology recommendations were extrapolated from interviews, usability tests, questionnaires and literature. And while the recommendations were audited and tested by target staff and students, a true test of their efficiency within the educational institutions of the South Pacific would require studies that compared classes that used these methods in their educational technology to those that didn't.

Moreover, in institutions where the value of producing graduates who can efficiently fit into "western" careers and concepts of success is being questioned, the entire notion of a "test for efficiency" requires further consideration. "Does the pacific really need so many more teachers and 'government' men? Are we caught up in the myth of manpower planning because we have failed to examine the basic premises of a developmental philosophy?" (Wah, 1997, p. 74)

While discussing possible conflicts between "pacific" and "western" tools and constructs, it is important to consider such conflicts within the research project. Although most of the programmers, participants and designers in this project grew up in the USP region, the project head grew up in a culture quite different from that of the staff and students who are the focus of this project. The impact of cultural biases on "outsider research," and the misunderstandings and misrepresentations such biases often introduce have been widely documented in academic press (Smith, 1999; Thaman, 2003b). Although staff from the USP region audited all methods and conclusions, and findings were based predominantly on the perspectives of people from the region, these conclusions, as with all educational media, should not be applied without undergoing further reflection by people from the cultures for whom the tools are developed. It would also be immensely valuable for people from the cultures represented in this study to conduct research looking at the links between regional pedagogy and educational multimedia.

Developed by "western" tools and constructs, multimedia can have alienating and westernising influences on South Pacific cultures. Through careful development of educational media according to the needs and values of the regions in which it is being used, it can have an enriching rather than diluting effect on the diverse cultures throughout the region. However, due to the relative infancy of educational multimedia studies in the region, and as the deeper issue of determining what constitutes culturally appropriate educational technology are multifarious and largely unresolved, the research team shifted the emphasis of their recommendations from deciding what is culturally relevant to methods that enable teachers and students to make their educational multimedia more culturally relevant themselves. Rather than deciding which approaches are more "pacific" or "efficient," the research team's recommendations allow teachers and students to use educational multimedia to craft their own solutions.

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Appendix 1

Notes and quotes from the interviews referenced in this paper

Title	Web Address
NmFiji	http://www.grographics.com/wiki/index.php/NmFiji
NmKiribati	http://www.grographics.com/wiki/index.php/NmKiribati
NmMarshalls	http://www.grographics.com/wiki/index.php/NmMarshalls
NmNauru	http://www.grographics.com/wiki/index.php/NmNauru
NmSamoa	http://www.grographics.com/wiki/index.php/NmSamoa
NmSolomons	http://www.grographics.com/wiki/index.php/NmSolomons
NmSporeBrainstorm	http://www.grographics.com/wiki/index.php/NmSporeBrainstorm