# Situated design of computer assisted language learning (CALL) to support an endangered language

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**Abstract:** This paper describes two unique partnerships between two Australian Aboriginal communities and a commercial computer assisted language learning (CALL) development- publishing company. The partnerships are conducting community–based projects of CALL development to support the continuation of the communities' languages. The project aims to produce a new model of situated design of CALL which will be available as a template for other communities who are interested in language continuation. The researcher is working at the cultural interface between Western colonising academia and Indigenous knowledge systems and lifeways. The CALL shell and editing template will be sustainable only with the support of a linguist and training in each community.

**Keywords:** Endangered languages, CALL, situated design, Australian Aboriginal languages

## Introduction

The invasion and subsequent colonisation of Australia by European settlers cost the lives of many of the estimated 250 (Walsh, 1991) original Australian Aboriginal languages. Earliest contact with European settlers occurred in the eastern states, while contact in the north-west of Australia first occurred in the 1830s (Vigilante, 2001), and some Aboriginal clans only came out of the desert as late as the 1960s (Pindan, 2012). This project is located in the west Kimberley region of Australia (see Fig. 1.) and is concerned with the design of a computer assisted language learning (CALL) shell program through collaboration of two language communities and a successful CALL design-development-publishing company. The community languages are Nyikina, a non-Pama-Nyungan River language and Walmajarri, a Pama-Nyungan Desert language, thus representing both major (linguistic) families of Australian Aboriginal languages. The company (Protea Textware Pty Ltd) is sponsoring a PhD student (the author) who has 20 years of CALL design and development experience. The project was initiated when the Nyikina community approached the company in 2009 for a CALL resource to support their language continuation efforts. The project will deliver at least one CALL program for each language which the communities will own, a shell program for further CALL programs and an editing template for the content.

The intent is to reuse documentation materials created by independent linguists working with Aboriginal communities, including existing digitised dictionaries and records as well as grammars and orthographies and Protea Textware's language teaching approach. Previous attempts to draw on existing materials, such as digitised dictionaries, have been unsuccessful (Yang & Rau, 2005). The CALL program will have a phonemic module, an

interactive picture dictionary module, communicative whole language activities based on longer texts and ideas for authentic (real-life) learning activities plus cultural information.
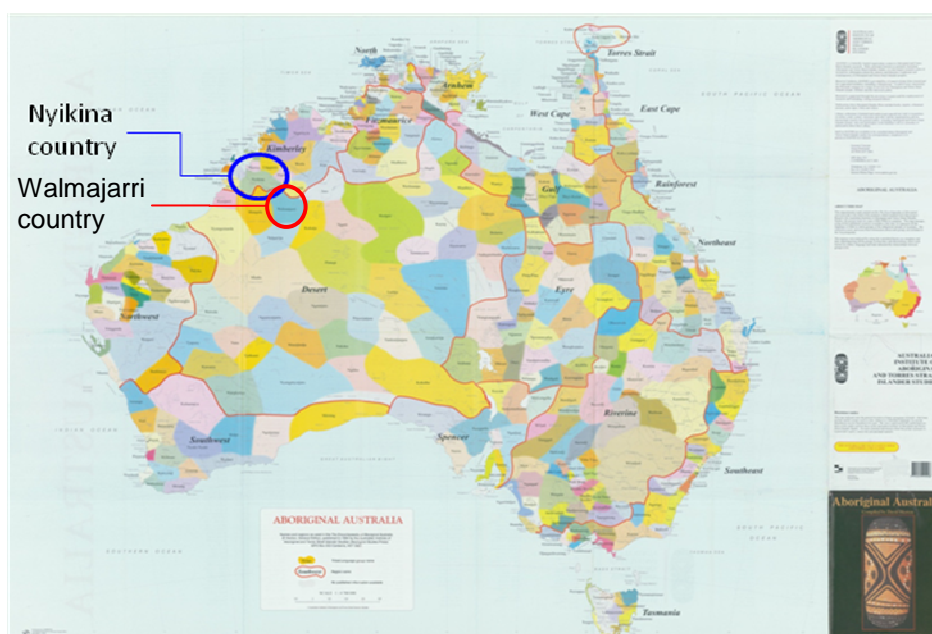


Figure 1. Nyikina Country and Walmajarri Country in Australia (AIATSIS, 2008)

## 1. Theory

### 1.1.1 Cultural Interface

The researcher is working at the cultural interface (Durie, 2005) between Western colonising academia and Indigenous knowledge systems and lifeways. Tuhiwai Smith (1999) notes that the research activity is transformed when Indigenous people become the researchers. In this project, this is reflected in the methodological processes, the outcomes, feedback of information to the communities and ownership of the outcomes.

The project was initially planned to work in the Nyikina community with the Nyikina language as a prototype for the template. However, contact with interested persons from a second community led to a second Aboriginal language (Walmajarri) being included in the project. Formal procedures such as the Intellectual Property (IP) agreement, permissions and invitations were already in place before work actually started on country for Nyikina language. Meetings were organized with Walmajarri community members with language and project experience and skills on country at Djilimbardi on the edge of the Great Sandy Desert in north-west Australia to negotiate formal permissions and agreements.

### 1.1.2 Situated Design

The concept of situated design in the context of endangered languages is here proposed to mean taking place on country with the community fundamentally involved in the design. Usually, situated design describes user-centred design (Wilson, 1995) meaning design by designers taking into consideration the needs and proficiencies of the end-user. I propose that situated design be taken to mean that the end-users are an integral part of all stages of the design (Cárdenas-Claros & Gruba, 2009). Previous attempts at developing CALL programs for endangered languages have not been designed on country in partnership with

communities. They have instead been designed by designers, teachers or programmers in academia or commercial offices with varying success (Nathan, 2006; Ward, 2001).
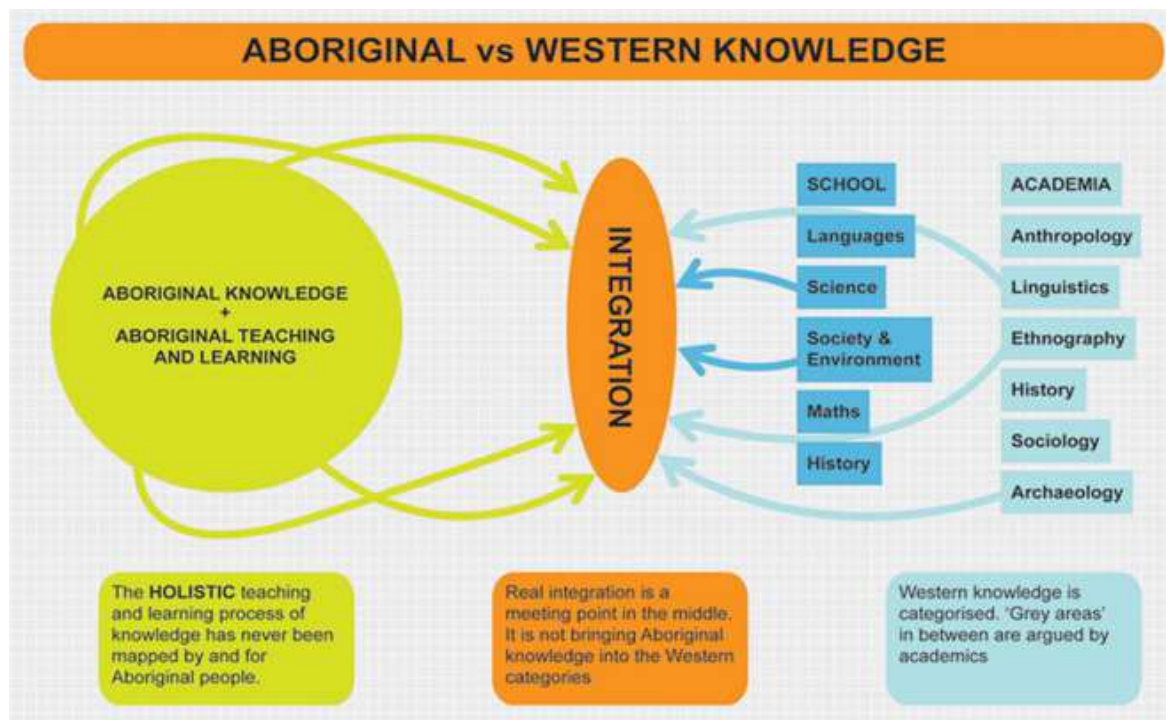


Figure 2. The cultural interface (Bedford & Casson, 2010)

### 1.1.3   Actor-Network Theory (ANT)

Actor-Network Theory (Latour, 2005) proposes that country, culture and language, as well as speakers, designers, technicians and programmers are all 'actors' in the design process. Without all of them, the process will fail.

## 2.   Methodology

The three theories are actualised as they intertwine and reinforce each other through the design and development of the program, carried out entirely on country, and led by community protocols and traditions. Working with two different languages simultaneously, more rigorous evaluation of the template can be undertaken than was at first proposed.

### 1.2   Design-Based Research

The research approach in this study is that of design-based research (DBR) (as described by Collins et al (2004) as design research). In the context of instructional design, DBR is described as extending instructional designers to create practical and transferable design principles (Wang & Hannafin, 2005). Design-based research starts with a problem and then a theoretical solution is proposed, the principles for design formulated, the design implemented and evaluated (in a process similar to Critical Participatory Action Research (Kemmis, 2008)) and this cycle is repeated until a satisfactory solution is obtained.

### 1.2.1 Phase I

The **problem** of appropriate design for CALL for an Indigenous language was explored both from an instructional design point of view and from the Indigenous perspective, from the literature and from consultation. Draft design principles were established based on Aboriginal relationality, situated design, ANT and Protea Textware's philosophy of CALL design (Westwood & Kaufmann, 1999).

### 1.2.2 Phase II

The **preliminary solution** proposed an organized, structured series of meetings on a planned timeline. After consultation with the communities it was decided to follow an Aboriginal way of making decisions by all interested persons in the community meeting somewhere on country for a few days to talk, listen, sing and dance about the preliminary design issues. A smaller design group was set up for each language for ongoing reference, feedback and redesign. The solution also called for a CALL program that could be reused for different endangered languages, and so the content should be separated from the programming. Thus the CALL program is designed as a shell which reads all content data from underlying xml files, with a separate editing interface for the xml files.

### 1.2.3 Phase III

The **design** followed the draft principles with a number of aspects running concurrently: (a) create a program to read in existing documentary files from Lexique Pro (dictionary software – http://www.sil.org) to output in xml files; (b) contact, inform and seek support from senior community leaders; (c) establish trusting relationships with communities; (d) arrange intensive workshops; (e) design a CALL prototype shell as a starting point for discussion; (f) form smaller design groups for ongoing participation; and (g) design an editing interface for the xml files. The content (linguistic and contextual) and protocols desired by the community are decided at the intensive workshops, while redesign is ongoing with the smaller design group, based on evaluative feedback. The author will create structured exercises and activities with the content using Protea Textware models.

In the **implementation** stage, the program to read Lexique Pro files was created in Adobe Flex by the author. It outputs xml files that the CALL shell can read and display as an interactive program module. This has a simple push button interface. The author then wrote the remainder of the CALL shell program in Adobe Flex (AIR project) based on Protea Textware technologies and using the refined design principles arising from consultation with the communities as the design/program progressed. Technology access in the community is poor, leading to the decision to create a desktop-based program which would be accessible by all. Consultation determined that the program should be suitable for all ages and literacy levels. Implementation of the program will take place in after-school language classes (voluntary), libraries, resource centres, on home computers and on the project laptops taken to meetings with community.

**Evaluation** will draw on recorded open yarning sessions with users of the software and the consultant linguists and TechSmith Morae screen recording software. This will be collated and summarised before each meeting of the respective design groups.

### 1.2.4 Phase IV

**Redesign** and refinement of design principles will take place at each design group meeting.

## 3.  Outcomes

The project will result in the formulation of a process for designing and developing a CALL program for endangered Australian Aboriginal languages and a construct which can be used as a template for other communities interested in language continuation.  The xml editing interface will be developed in tandem with the CALL program and completed after the CALL program is finished.

To produce further CALL programs from the templates, training in use of the template will be required along with a linguist in the community.

## Acknowledgements

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