Chapter 2
Cross–Cultural Languages
Behind Technology–Enhanced Language Learning

John Alexander Roberto
Pompeu Fabra University, Spain

ABSTRACT

Technology-enhanced language learning (TELL) is the result of the evolution of digital language, that is, a special code created by human beings to interact with computers. Digital language has, in turn, allowed for the creation of more specific languages. On the web, TELL is supported by three cross-cultural languages: natural language, visual language, and artificial language. A natural language, such as English or Spanish, becomes cross-cultural when it is processed by automatic means. A visual language is a system of communication using visual elements, such as pictograms. An artificial language, such as programming languages, is designed to communicate instructions to a machine. The author calls this trilogy of languages W3langs. This chapter explores the relationship between TELL and W3langs.

INTRODUCTION

Technology is essentially cross-cultural. While culture allows for the behaviors of one individual to be comprehensible to the other member of that culture, technology allows for the behaviors of one individual to be comprehensible to the rest of the world. While cultural factors influence the perception and usage of technology, it is also true that the use of technology influences cultural variables. The resulting feedback from technological products has an impact on local values and traditions. For example, access to information and people “anytime and anywhere” has changed the understanding of cultural temporalities in Australian and African rural communities (Taylor, Soro, Roe, Lee Hong, & Brereton, 2017; Wyche, Smyth, Chetty, Aoki, & Grinter, 2010).

It is important to remember that human beings are essentially technological (Ortega y Gasset, 1972). For that reason, it makes more sense to build digital systems with universal functions and features than build digital systems with cultural dimensions relevant to the people using them. It is erroneous to think...
that, as more cultural differences are discovered, extra rules and guidelines have to be developed. Apart from theoretical debates about standardize/customize dichotomy, designers and engineers are working hard to make it possible for digital systems to be culture-neutral. Becoming culture-neutral means removing the cultural elements from both the visible and invisible structures of systems. And it means, especially, speaking the same codes or languages.

Hypertext is the best-known example of the cross-cultural standardization of languages. In essence, hypertext is a multi-dimensional system made up of several languages. It is a body of natural languages and pictorial materials interconnected by programming code. Natural languages exist within a specific culture and society. However, they become cross-cultural when they are digitalized and processed by automatic means. Visual languages ensure user experience across cultural boundaries by using “universal” representation such as pictograms, diagrams or icons. Artificial languages could be considered to be transcultural artifacts because they are designed to communicate instructions to a machine.

Technology-Enhanced Language Learning (TELL), deals with this trilogy of languages which the author calls the W3langs. W3langs contribute to the increase of cross-cultural competencies among students and teachers by developing cross-lingual tools (Diane Litman, 2016), embracing visual thinking (Huh, 2016; Arnheim, 1969), and developing feedback and embodiment technologies (Farr, Price, & Jewitt, 2012). W3langs become hypertext as a cross-cultural medium that is changing learning and teaching skills such as assessment (Somasundaran, Lee, Chodorow, & Wang, 2015), instruction (Rudzewitz, Ziai, De Kuthy, & Meurers, 2017), immersion (Clydesdale, 2017), and feedback/embodiment (Cheng, Yang, & Andersen, 2017).

In this chapter the author assumes that teachers have more opportunities to establish a cross-cultural learning environment by taking advantage of the ability of digital hypertext to be a mediator of learning. This is because any hypertextual environment is composed of those three digital and cross-cultural languages: natural, visual, and artificial languages. This chapter is organized into three major sections in addition to this introduction. In the first section, the author offers a broad definition of this trilogy of languages (W3langs). In the second section, the author explores the relation between TELL and W3langs, and presents a selection of works that provide support to this approach. Finally, section three presents the conclusions.

THE W3LANGS

One of the most common ways to modularize an information-rich program in software engineering is to separate it into three layers or tiers: the presentation tier (UI), the domain logic tier, and the data tier management. The presentation or view tier displays information related to the application services. The logic tier controls the application’s functionality. The data tier supports storing information in a lasting form on disk. This multitier architecture (n-tier architecture) differentiates the level of abstraction that is presented to consumers and provides a model through which developers can create flexible and reusable applications. The Three-Tier Model is used, among others, by Cloud Computing infrastructure, Model-View-Controller design pattern, and web development.

Cloud Computing has recently emerged as a compelling paradigm for managing and delivering services over the internet (“the cloud”). Many organizations and researchers have defined the architecture for Cloud Computing. In general terms, there are three layers: (1) infrastructure, (2) content, and (3) information. An infrastructure cloud refers to the hardware and software components that run applications