Chapter 5.5
Developing Serious Games for Learning Language-in-Culture

K. A. Barrett
Alelo, Inc., USA

W. Lewis Johnson
Alelo, Inc., USA

ABSTRACT

This chapter will focus on the instructional design process used to create Alelo's language and culture training programs. The objective of the design process is not just a serious game, but an integrated learning environment which combines serious games with other supporting learning activities. Learners apply their newfound communication skills and cultural knowledge to complete tasks in a simulated environment. The chapter will specifically focus on the design and development phases of the process, which uses interdisciplinary teams combined with an iterative approach to meet customer needs. The authors employ innovative learning technologies such as artificial intelligence and speech recognition; these add greatly to the learning experience but also introduce unique challenges for instructional design. Central to the instructional design process is situated instructional design and rapid prototyping. Authoring techniques that facilitate the creation of lessons and games that scaffold the learner from beginning- to intermediate-level proficiency are also be described. In addition, the chapter will explain how Alelo's technology instantiates current theories, models, and research findings in the fields of language learning, serious games, and artificial intelligence.

INTRODUCTION

This chapter will describe how Alelo designs and develops serious games that teach foreign languages and intercultural communication skills. Immersive, interactive 3-D video games simulate real-life communication, allowing users to role-play with animated "socially intelligent virtual humans" that recognize the user's speech, intent, gestures and behavior. These game experiences are combined with interactive multimedia learning materials to provide learners with comprehensive learning environments that enable them to progress from no knowledge of the language and culture to significant levels of job-related communicative proficiency.

Although there many educational computer games available in the market today, there are relatively few that, like Alelo games, are complete learning environments designed with learning theory in mind. Alelo's games are in widespread use, particularly by military personnel deploying overseas. At least 50,000 people have trained so far with these games for self-paced learning, supervised learning programs, and blended learning programs. Developing these games and getting feedback from the users has provided valuable knowledge and insights into how to use game-based learning effectively to teach foreign languages and cultures.

The pedagogy used is based upon constructivist learning theory, situated cognition theory, sociocultural learning theory and, more specifically, on task-based second-language learning theory. Task-based language learning emphasizes learning in the context of tasks that require learners to communicate meaning, as in real life (Ellis, 2003). Alelo's game-based learning approach immerses learners in a variety of simulations of real-world settings in which they must communicate with non-player characters (NPCs) using spoken language to accomplish tasks. The artificially intelligent NPCs are designed to engage in dialogue with learners on topics related to the current task. The

learner experience is thus qualitatively different from typical computer-based language learning software in which speech recognition is either not used at all or focuses on learner pronunciation rather than the learner's ability to convey meaning.

We strive to align the tasks in the learning environment with the real-life tasks that learners can expect to engage in when they use the language in the foreign country. This approach is aligned with sociocultural learning theory, which seeks to study the mediated mind in the environments in which people engage in normal living activities and thus seeks to maintain the richness and complexity of living reality instead of deconstructing it (Lantolf & Thorne, 2006). In 3-D worlds, learners interact with virtual avatars in nonthreatening environments. This has been shown to be important to adult learners who are often intimidated by the live language classroom experience (Johnson, Wang, & Wu, 2007). Learners who practice communicative skills in the context of these realistic communicative tasks find it relatively easy to transfer their communication skills to comparable real-life situations even though they have experienced them only in a computer simulation.

Moreover, by placing learners in an immersive game context, we can employ a variety of game design methods to promote learner motivation. Motivation is often a significant barrier to language learning. Language learners frequently find foreign language curricula to be boring and/or frustrating (Franc, Lawton, & Morton, 2008). This tends to lower learners' motivation to engage in foreign language study. Many learners have low self-efficacy for foreign language learning, particularly for more difficult languages such as Arabic or Chinese. When these factors are combined, the result can be high rates of learner attrition (Doughty, Nielsen, & Freynik, 2008). Alelo's game-based learning approach strives to counteract these common motivational impediments. For example, the immersive games provide extensive levels of engagement, motivation, and

Related Content

A Novel Spread Spectrum Digital Audio Watermarking Scheme
(2012). *Signal Processing, Perceptual Coding and Watermarking of Digital Audio: Advanced Technologies and Models (pp. 115-133).*
www.irma-international.org/chapter/novel-spread-spectrum-digital-audio/56065

Digital Epistemologies and Classroom Multiliteracies
Heather Lotherington (2008). *Handbook of Research on Digital Information Technologies: Innovations, Methods, and Ethical Issues (pp. 264-283).*
www.irma-international.org/chapter/digital-epistemologies-classroom-multiliteracies/19848

Implement Multichannel Fractional Sample Rate Convertor using Genetic Algorithm
Vivek Jainand Navneet Agrawal (2017). *International Journal of Multimedia Data Engineering and Management (pp. 10-21).*
www.irma-international.org/article/implement-multichannel-fractional-sample-rate-convertor-using-genetic-algorithm/178930

Underwater Image Segmentation Using Human Psycho Visual Phenomenon
Soumyadip Dharand Hiranmoy Roy (2018). *Intelligent Multidimensional Data and Image Processing (pp. 130-146).*
www.irma-international.org/chapter/underwater-image-segmentation-using-human-psycho-visual-phenomenon/207895

Broadband Satellite Multimedia Networks
Paolo Chini, Giovanni Giambeneand Snezana Hadzic (2009). *Handbook of Research on Wireless Multimedia: Quality of Service and Solutions (pp. 377-397).*
www.irma-international.org/chapter/broadband-satellite-multimedia-networks/22032