

## Chapter 63

# Weaving Web 2.0 and Facial Expression Recognition into the 3D Virtual English Classroom

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### ABSTRACT

*Of late, considerable attention has been given to the linking or “mashing up” of virtual worlds and Web 2.0 tools. The authors incorporated several Web 2.0 tools, including blogs, audioblogs, wikis, Facebook, Twitter, and Flickr, and a facial expression organizer together into the 3D Virtual English Classroom called VEC3D 5.0, thereby opening up new possibilities for collaborative language learning. In considering the needs of language learners, this study combines synchronous and asynchronous learning environments and methods to propose a blended language learning solution. VEC3D 5.0 offers the possibility of applying situated learning, multimodal communication, and facial expression recognition to language learning and teaching. VEC3D 5.0 has shown itself to possess tremendous potential as an optimal language learning environment. Integrating Web 2.0 applications in the form of open social networking and information sharing tools into VEC3D 5.0 supports collaborative and reflective language learning, and in particular, writing and cultural learning. The purpose of this study is to explore the application of a hybrid prototype solution, which combines the inherent strengths of both virtual environments and Web 2.0 applications, and to provide a framework for developing innovative pedagogies for experiential language learning in this context.*

### INTRODUCTION

In Taiwan, whether learners are situated inside or outside of the classroom setting, opportunities for in-depth exposure to target language and culture, naturalistic language acquisition and social interaction are usually limited. 3D Collaborative

Virtual Environments (CVEs) serve as the context for situated language learning, as well as providing open social networking tools for collaborative language learning, in which learners form a community of practice. The purpose of this project is to make it easy for English as a Foreign Language (EFL) learners in Taiwan to connect with other

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learners, instructors and international English speakers, and through these interactions and the integration of Web 2.0 applications into a CVE, the 3D Virtual English Classroom (VEC3D 5.0), to foster students' language learning process and autonomy. The idea of connecting these technologies originated from user needs.

Teaching language entirely in virtual worlds without using other available Web tools would limit the possibilities for gathering and sharing information, and generating new ideas, content, and discussion topics. The virtual world provides context for language learners. However, on its own, it is found to be somewhat lacking in terms of helping learners to acquire the target language. Moreover, it doesn't necessarily encourage prolonged engagement. To overcome these limitations, linking the virtual world with Web 2.0 stimulates further discussion, prolongs conversation, and provides more opportunities for collaboration and interaction. Combining Web 2.0 and VEC3D is seen as having potential for the development of new forms of language learning and acquisition. The combination also enables learners to broaden their social networks and co-construct knowledge through interaction and collaboration in online communities.

In order to support EFL learners' needs in terms of interaction, collaboration, social networking and information-sharing, we proposed a blended solution which combines VEC3D 5.0 and Web 2.0 applications. A group of Web 2.0 tools, including blogs, audioblogs, wikis, Facebook, Twitter, and Flickr, were integrated into the virtual environment to support collaborative and situated language learning, in particular, writing and cultural learning. We assume that writing development and cultural learning arise from interaction, "collaboration with more capable peers" (Vygotsky, 1978), and guidance from instructors. The development of both writing and cultural learning is the product of interaction and group dynamics in the learning process. Accord-

ingly, we attempt to develop and integrate Web 2.0 dynamics into VEC3D 5.0, which is expected to facilitate the formation of a Web-based "community of practice" (Lave & Wenger, 1991) in a foreign language learning setting. Ultimately, the project's goal is to prepare students to be able to communicate in English naturally and effectively outside the classroom.

In addition to these elements, we also incorporated a facial expression analyzer, which facilitates our analysis of the English language learners' interactions, understanding and consciousness. Facial expressions provide nonverbal cues related to human emotions and behaviors, such as interaction, understanding and consciousness, all of which play important roles in language education. Facial expression analysis plays an important role in the language teaching process. Language instructors need to understand students' body language, as it can reveal a lot about the level of student interaction, the students' understanding, and the degree to which students are paying attention. Instructors can use this information to adjust their teaching to meet students' needs. The facial expression analyzer in VEC3D 5.0 lets English teachers know when it may be advantageous to adjust their speaking rate or teaching strategies to make input comprehensible to learners so as to meet learner needs. The VEC3D research team was able to take advantage of the facial expression analyzer's technical possibilities to expand on this idea and develop it within the framework of VEC3D 5.0.

## **BACKGROUND**

Language learning and acquisition arise from interaction, which can take the form of guided interaction with instructors (Krashen, 1981), interpersonal interaction and interacting with the environment (Capocchi Ribeiro, 2002). The Interaction Hypothesis (Long, 1985, 1996) proposed

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