

Chapter 13

Learning to Follow Directions in English Through a Virtual Reality Environment: An Eye Tracking Study and Evaluation of Usability

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ABSTRACT

Learning how to give and follow directions in English is one of the key topics in regular English as a Foreign Language (EFL) courses. However, this topic is commonly taught in the classroom with pencil and paper exercises. In this chapter, a scaffolded virtual reality (VR) environment for learning the topic of following directions in English is introduced. An eye tracking study was conducted to determine how students perceive the scaffolds for completing the learning task, and an evaluation of acceptance and usability was conducted to identify the students' perceptions. The results show that scaffolds in the form of text and images are both effective for increasing the students' learning performance. The gaze frequency is higher for the textual scaffold, but the duration of gaze fixations is lower for the scaffolds in the form of images. The acceptance and usability of the VR environment were found to be positive.

INTRODUCTION

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Learning how to give and follow directions in English as a Foreign Language (EFL) courses is necessary to develop skills so that students can understand how to get to another location by following instructions. This topic is taught in regular English classes and is a crucial topic in many curriculums (Taylor-Hamilton, 2004). In this topic, students learn the meaning of expressions such as “go straight”, “turn left”, “turn right”, “cross the avenue”, among others, and students develop skills to follow instructions to arrive at a particular place in a city. The possibility of transferring this knowledge to a real scenario could be facilitated if this topic were taught by doing practical exercises that can be as real as possible.

In EFL courses, there are situations where teachers do not have the proper resources to explain a topic other than in books and simple board exercises, and this can cause that many students lose the interest in learning this subject, making the teaching process more difficult. However, there are some positive experiences of integrating technology in language learning (Sabiri, 2020).

The authors of this chapter interviewed some EFL teachers in the Konrad Lorenz University in Colombia and teachers acknowledged that there should be more interactive ways to learn the topic of learning to follow directions in English by using mobile applications or other interactive technologies. Moreover, teachers are always looking for new ways to motivate the students and apply new technologies in the learning field (Jenkins, 2016). Furthermore, the interaction with computers and technological learning environments can be helpful to get a better understanding of a topic or subject (Martirosov & Kopecek, 2017).

From the interviews, the authors identified that most of the teachers are open to new technologies such as augmented reality, virtual reality or mobile applications that will help their students to be more interested in learning how to give and follow directions. According to the teachers, these technologies might even replace writing and board exercises and these technologies can be a proper support for the English class. The EFL teachers that participated in the interview argue that they explain the topic of giving and following directions using board exercises, photocopies and some practical exercises with objects from the classroom. However, according to the teachers, these exercises are not enough to capture the students’ attention or increase their interest in the topic. In that regard, since technology is continually evolving and changing, a technological solution can help to improve the learning process of this topic.

Virtual Reality (VR) is an immersive technology used for the simulation of the real-world (N. Singh & Singh, 2017). According to Steuer (1992), the term “virtual reality” was coined in 1989 by Jaron Lanier and is defined as a medium that consists of a collection of technological hardware that includes computers, head-mounted displays (HMD) and sensors that provides a real-time animation that is controlled by the sensors, and the visualization is presented in stereoscopic displays. This term should not be confused with the term Augmented Reality (AR), which instead of creating a virtual environment to interact with as in VR, AR simulates artificial objects in real objects (Martirosov & Kopecek, 2017). Some studies show that VR environments allow improving learning, either in the simulation of activities in realistic contexts or just to improve certain skills of an individual (Al Awadhi et al., 2018; Martirosov & Kopecek, 2017) VR has multiple applications in many fields beyond education such as in the military field, medicine, marketing, entertainment among others (Singh & Singh, 2017; Jiang et al., 2017; Garcia-Cardona et al., 2017).

VR has also been applied to enhance the learning process of different languages (Lin & Lan, 2015) and there seems to be evidence of the effectiveness of VR for learning languages over traditional teaching methods. However, there are still some gaps in the literature on the use of VR for teaching English as a foreign language (Pinto et al., 2019; Radianti et al., 2020). One of those gaps is the lack of research on the effect of scaffolding mechanisms on the students’ learning performance in immersive VR environ-

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