Integrating a virtual reality application to simulate situated learning experiences in a foreign language course

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Abstract. Immersion through Virtual Reality (VR) gives the subjective impression that the learner has a realistic experience (Dede, 2009). The pedagogical potential of VR provides the means of enabling constructivist places of contextualised learning. This paper aims to examine the potential the VR application *Mondly* may have to maximise interactivity and aid learners in proactively experiencing empirical conversations that emulate authentic contexts. The research took place in an undergraduate course Italian I (A1, Common European Framework of Reference for languages), offered by the Cyprus University of Technology. The present study adopts a quasi-experimental design to evaluate the impact of *Mondly* on Italian learning. Digital material is incorporated into the lesson to promote contextualised learning. An experimental group is subjected to learning through *Mondly* whereas a control group is subjected to conventional lectures utilising the same material as the experimental group.

Keywords: immersion, virtual reality, Mondly, contextualised situated constructivist learning.

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1. Introduction

New and more sophisticated technologies have permeated education in the past two decades, gradually remodelling teaching and learning (Garrote, 2018). Schwienhorst (2002) has highlighted the change in the area of computer-assisted language learning, which draws upon the Internet as a system that provides multiple communication tools to ensure authentic contexts in the target language and its speakers.

The exponential growth of wireless communication and multimedia environments have employed the use of VR in order to promote authentic and immersive learning environments. As a result, we are now witnessing a new paradigm shift in learning, from teacher-centred to learner-centred, since learners are no longer passive recipients of information, but they actively participate in the learning process which promotes real-world-like audiovisual simulations and scenarios (Chung, 2012). Immersion in a digital environment and the experiential, learner-centred approach of virtual environments draws upon the theory of situated learning. Dede (2009) supports that situated learning in immersive interfaces can aid learners join authentic communities with real-world settings and virtual entities as well as experiencing real-world scenarios.

The social character of learning was first proposed by Lave and Wenger (1991). They supported the idea that learning is a social process during which learners co-construct knowledge within an authentic environment. Learning is a process of enculturation so activities should be framed within a social context in order to be meaningful and authentic for learners. In fact, immersive technologies provide opportunities for situated learning since the reality of the authentic context is enhanced without minimising the validity of what needs to be learned.

Concerning foreign language learning, simulating authentic contexts in a traditional classroom setting can be a difficult task for the teacher. Teacher-fronted activities do little to enhance the negotiation of meaning and discourse in the target language (Houston, 2006). Hence, this paper aims to challenge the teaching of a foreign language, promoting intercultural communicative competence with the presence of the target language context. It presents an example of virtual learning environment, through the VR application *Mondly*, in a foreign language (Italian) class in order to put learners in a situated learning environment as a way of increasing authenticity in their learning context through realistic scenarios. *Mondly* is a foreign language learning app which focuses on a more contextualised approach to teaching a foreign language.

2. Method

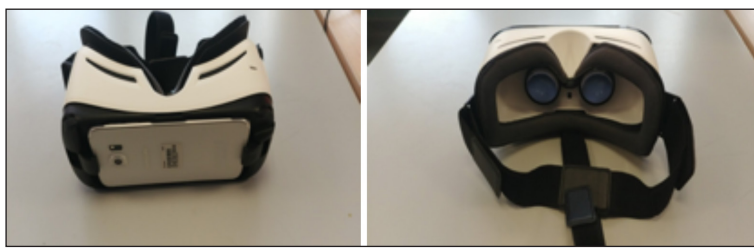
2.1. Participants

Eighteen university students between 17-25 years old participated in the study. The 18 participants were seven males and 11 females. Participants, coming from six different cities during the study, were studying in a public university in southern Europe. The participants came from six different fields of study and the majority, 15 out of 18, were in the senior year of their studies.

2.2. Mondly application

Mondly is a language learning application which is compatible with Samsung Gear VR (Figure 1). Users may select one of the various contexts available and interact with a pedagogical agent who helps and asks questions to guide the conversation into a specific context. Users may respond by selecting one of the two or three possible answers presented on chatbots and express the answers orally. When users find the correct answer, a green check appears over the transcription of what was said, otherwise another answer should be given. The application integrates speech recognition and it is available in 33 languages, with levels ranging from beginner to advanced.

Figure 1. Samsung Gear VR powered by Oculus: the VR headset used in the study



2.3. Research design and data collection

The present study adopts a quasi-experimental design to evaluate the impact of *Mondly* on Italian learning. The research data were collected in three days, in a total of six 45-min sessions of the lesson Italian I. Pre- and post-tests were conducted for the purposes of the research. The pre- and post-tests were the same

in order to evaluate students' pre-knowledge and they were comprised of three different sections. In the first section, students completed six open questions of demographic data (name, age, department of study, interests, etc.). In the second section, students completed seven close questions and one open question regarding past experiences with VR software and hardware. In the third section, students had the opportunity to complete 14 multiple-choice questions based on the emerging situation they faced during the data collection through VR. For every one of the 14 multiple-choice questions, marks were given: zero for the wrong answer, one for the almost right answer, and two for the right answer. Students were divided into two groups: one experimental and one control group. In the experimental group, students worked individually on their pre-tests for 15 minutes, they experimented with the VR application for 15 minutes (in a total of three different days), and worked on their post-tests for 15 minutes, after their experience with the VR application and gear.

The students' experimentation with the VR application was divided in two different phases. During the first phase, the orientation phase, the students had the opportunity to test the equipment and their working state in the *Mondly* application. During the second phase, students experienced *Mondly*, and emerged into contextualised learning through the context of ordering at a restaurant, exchanging opinions about the food, drinking with the waitress, and meeting other guests of the restaurant. All of the research activities mentioned above were individually conducted, without any intervention from the instructor. In the control group, the students worked individually on their pre-tests and they were taught through a more traditional communicative method of teaching, including role play, in a 45-minute lesson session. They responded to questions and exercises involving the creation of dialogues and at the final stage, students worked individually on their post-tests.

3. Results and discussion

The present study adopted a quasi-experimental design to evaluate the impact of *Mondly* in an Italian class to promote contextualised learning. An experimental group was subjected to learning through *Mondly*, whereas a control group was subjected to conventional lectures utilising the same material as the experimental group. Both groups worked in the restaurant context.

An independent *t*-test was conducted to compare the performance of the control and the experimental group.

Table 1. Comparing the two groups' test means

Performance	Group	x	SD	T	p
Pre-test	Control	32.71	2.49	1.88	0.79
	Experimental	29.50	3.97		
Post-test	Control	32.42	3.10	2.39	0.030
	Experimental	28.90	2.92		

As we can see in Table 1, regarding the pre-test, the control group scored higher in comparison with the experimental group; the difference was not large enough to be statistically significant (t= 1.88, p=0.79). Regarding the post-test group, as we can see, students in the control group scored higher than the students in the experimental group; the difference was statistically significant (t=2.39, p=0.30). The small student sample in both groups constitutes a limitation since a bigger sample of students is necessary to participate in the two groups in order to test whether the *Mondly* application helped simulate an authentic context. Furthermore, the in-class conduct of VR implementation displayed some impediments, such as student noise and the necessity to recharge the smart phone very frequently. The latter impediments hindered the normal flow of the lesson as well as speech recognition.

4. Conclusion

This paper described the implementation of the VR application *Mondly* for an Italian undergraduate course. Although the results showed that *Mondly* did not provide contextualised learning, it is suggested that a larger sample size would ensure better understanding and clearer and more accurate results. *Mondly* can also be used in other foreign language courses in order to gain a more complete perspective of the application. Finally, more contexts, i.e. being on a train or using a taxi, can be integrated as activities, since in our study we solely chose the restaurant setting. All the implications mentioned above ask for more extensive research in analysing the contextualised use of VR.

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