“Let’s date!” A 360-degree video application to support foreign language learning

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Abstract. New technologies are changing the way of learning foreign languages. However, one of the main challenges for software developers and mobile assisted language learning designers remains the creation of learning environments for students’ language immersion in and outside the classroom. This paper describes the design and evaluation of a VR-based mobile app called *Let’s date!*. The app enables Common European Framework of Reference for languages (CEFR) A1 level German language learners to interact with an immersive environment and to practise several language skills. The results have proven that the use of 360° videos based on realistic situations and combined with a conversational agent is suitable to reinforce students’ foreign language competencies.

Keywords: virtual reality, conversational agent, immersion, language learning.

1. Introduction

Nowadays, Virtual Reality (VR) technology has become more accessible to end-users. A look at the literature and commercial repositories, such as Apple App Store or Google Play Store, highlights that although there is an increasing interest in developing this type of apps for learning foreign languages, very few of them

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explore the real potential of VR (Berns, Mota, Ruiz-Rube, & Dodero, 2018; García et al., 2019). One of the main advantages of VR technology is that it allows the creation of immersive, realistic environments in which the user can directly engage with the VR environment and its content. In this sense, VR is not only attractive for those who follow a second-language acquisition approach (Berns & Palomo-Duarte, 2015) but also for those who use a constructivist teaching approach (Huang, Rauch, & Liaw, 2010). In this context, the current paper intends to explore the possibilities of VR techniques to create realistic learning scenarios based on both approaches, providing students with opportunities for language immersion as well as interaction in the target language.

2. Method

2.1. Experimental setting and case study

An Android mobile app, *Let's date!,* was developed for this study. The app emulates a dating agency in which learners have to interact via voice messages with a virtual agency assistant. The app consists of a set of 360º video snippets that are delivered according to a conversation flow between the student and the virtual agency assistant (see Figure 1). The study was carried out in a CEFR A1 level German foreign language course at the University of Cádiz (Spain). A total number of 24 students participated in the experience. All the language items covered by the app were based on the course syllabus and parameters from the CEFR. Moreover, the software was developed by taking into account the target students' language knowledge and language skills.

Figure 1. Student interacting with the VR environment and the agency assistant

The app enables students to immerse themselves in a realistic, life-like environment. It includes a conversational agent (chatbot) that simulates a human

conversation, handling at the same time the communication between the student and the agency assistant. Additionally this agent is responsible for recognising and understanding the students’ voice message while interacting with the app and its content.

During the VR experience, students were first asked about their individual characteristics (character, physical appearance, interests, age, place of living, etc.). Next, they had to indicate their expectations regarding the characteristics of their ideal boy- or girlfriends. Questions are posed at the end of each video snippet so that the learner must answer them by first registering and then sending a voice message which is stored by the system. According to the answer given by the learner (comprehensible and coherent answer) either a new video snippet is delivered or the previous one is delivered once again (in case the answer was not comprehensible or incoherent). This way, students can revise and eventually correct the given answer. The general procedure is illustrated in Berns et al. (2018, p. 778). In addition, the app collects all the answers given by each learner, allowing the teacher to do future learning analytics. Furthermore, the input voice messages are used to enrich the corpus of answers hence taking into account linguistic variations (Berns et al., 2018).

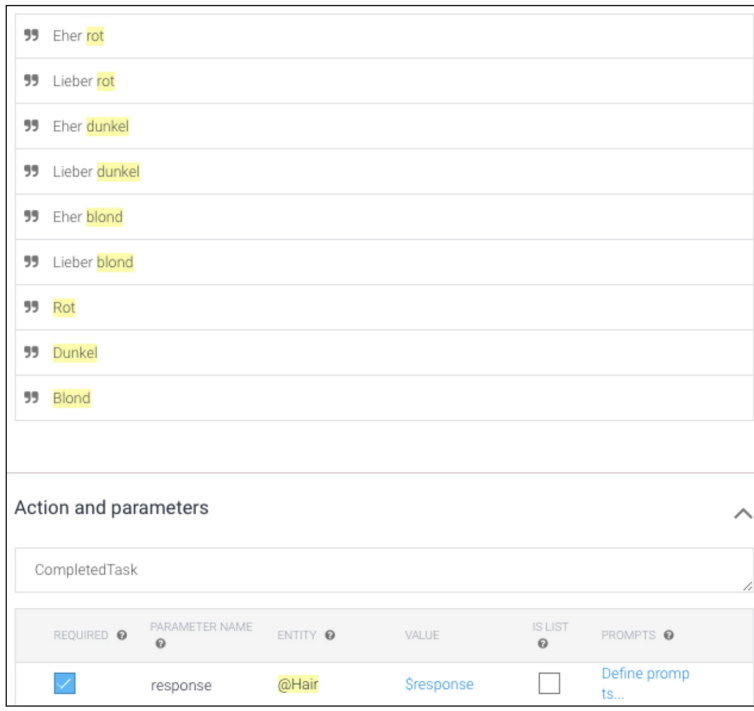
2.2. App development

The mobile app was authored by using the VEDILS tool, an extended version of MIT App Inventor. This platform allows non-professional users to create VR scenario applications enriched with analytic capabilities (Mota et al., 2018). In addition, the DialogFlow platform was used to build the conversational agent (Reyes et al., 2019).

DialogFlow is a tool that enables developers to create both specific chatbots as well as extensions (called actions) for the Google Assistant, which is built-in and available on Android mobile devices. In order to improve the user experience, the agent was fed with numerous training phrases (see Figure 2). This was done through the administration page of DialogFlow.

The machine-learning component generated with DialogFlow was later integrated into the VEDILS mobile app. This component ingests the user voice input, transforms it into a text message, and extracts the required data. To this end, Google Text-To-Speech and Speech-To-Text cloud services were also integrated. The structured data obtained from the user’s speech enable the app to choose the corresponding path of the decision flow.

Figure 2. Screenshot of the DialogFlow tool showing the training phrases for the user intention for expressing their preferences



2.3. Students' feedback on the learner experience

To gather students' feedback on the learning experience and their attitudes towards VR-based learning environments, they were asked to fill in a technology acceptance model questionnaire at the end of the learning experience (Berns et al., 2018). The questionnaire was based on the model proposed by Liu et al. (2010) and used by us to measure the perceived ease of use and usefulness, students' behavioural intention to use the app, and their attitude towards it, as well as the perceived playfulness.

Additionally, a five-point Likert-rating scale (from completely disagree to completely agree) was used for the analysis (Berns et al., 2018). Seventy-five percent of the participants confirmed that they became rapidly familiar with the app because of its ease of use. In terms of usefulness, most students rated the app as a handy tool for learning foreign languages, its potential for learning vocabulary, its

usefulness for improving comprehension skills, and its possibilities for improving oral expression. Besides, all students agreed on the benefits that the app provides for working on pronunciation. It is noteworthy that all participants showed a very positive attitude towards using VR-based learning apps like the one used for the current study. Additionally, all of them recommend other students to use VR-based apps to support their language learning process. Lastly, three out of four students felt fully immersed in the virtual environment and enjoyed the learning experience very much. However, 25% of the students experienced some trouble during the experiment and use of the app, which was mostly due to problems related to the network connectivity. In these cases, learners had to restart the app from the very beginning.

3. Conclusions and future work

The case study presented in this paper shows the possibilities and potential of VR apps for improving the learning of foreign languages. This kind of novel experience enables students to strengthen their language competencies through immersive and realistic situations. The students' evaluation of their learning experience based on the use of a 360° video application called *Let's date!* highlights not only the potential of VR-based apps for facilitating language immersion and thus language acquisition (Gadelha, 2018), but also to focus on specific skills such as speaking and pronunciation, which are often difficult to address using more conventional learning tools (learning platforms, social network sites, etc).

The current study and the feedback received also suggest that the use of chatbots, which allowed students to experience real-world interaction and conversation in the target language, was paramount for their positive evaluation of *Let's date!* However, further studies with a longer duration and larger and more diversified sample sizes (experimental and control groups) are needed in order to generalise the results obtained in this quasi-experimental study. Finally, we will leverage the expertise acquired with the development and evaluation of the current app to develop new learning apps focusing on other situations and foreign languages.

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