



A Road Map for Language Teachers on How to Extract Accurate Data for Research From Inside a Quest 2 Virtual Reality Environment: The Case of The Social VR Application Altspacevr

Dimitros Boglou¹ , Kristi Jauregi-Ondarra², Maria Christoforou³

Cyprus University of Technology, Cyprus^{1, 3}
Utrecht University, Netherlands²

Abstract

Virtual Reality has permeated our educational landscape in various forms and has unequivocally created new opportunities for language learning. As many VR devices became more accessible and mainstream, many educators have taken the opportunity to experiment with some kind of Virtual Reality. From simple smart phone-supported devices to more advanced and tethered VR systems that require extensive technical experience and a healthy budget in order to achieve the desired immersive experience that could be exploited for educational purposes. Nevertheless, as there are various VR systems and a myriad of applications constantly becoming available on various online platforms, a lot of research needs to be done by educators in order to establish the efficacy and impact of the chosen VR system or application. As language teachers, we might lack the technical experience and understanding of this tool. Furthermore, we might not have the required technical support in order to successfully capture and extract data that is necessary for research from inside the Virtual Reality world. These aforementioned aspects can be discouraging for language teachers when conducting VR-related research. This paper describes the challenges, technical steps, and technical requirements that were necessary to overcome the obstacles that I encountered in order to record and extract data for analysis of the virtual interactions from inside the virtual world of the social VR app AltspaceVR for a Virtual Exchange research project in 2022 with the VR headsets Oculus Quest 2.

Keywords: *Virtual Reality, Social VR Applications, AltspaceVR, Oculus quest, Makerspaces*

1. Introduction

Virtual Reality (VR) has been around for many years, but the first VR / AR head mounted display was created in 1968[1]. The high price, complex technology and lack of accessibility made this technology unattractive for many educators, including language instructors, as many of them did not have accessibility, proper funding or knowledge to use this technology[2]. Nevertheless, in 2017 a fully immersive VR system became mainstream with Oculus Rift [1]. The arrival of this more accessible VR device didn't change the aforementioned challenges as the equipment remained expensive and technical knowledge was still required to effectively employ such a powerful and enticing tool in the language classroom[3].

The arrival of stand-alone VR head-mounted display (HMD) such as Oculus Go and Oculus Quest changed the standing of VR in the educational world as VR became accessible and much more affordable. The permeation and proliferation of VR in our language classrooms triggered an increased desire to conduct various research in order to establish and uncover VR affordances, efficacies and usability in language learning. Even though many language instructors, including the language instructors at the Cyprus University of Technology were introduced and trained in various educational e-tools during the Covid-19 pandemic, certain technologies still require the user to have or gain specific knowledge before being capable of utilizing these technologies successfully for enhancing their classroom environment and research. Such technical shortcomings were uncovered when it came to collecting data from inside the 3D virtual world VE interaction.



This paper focuses on the obstacles, I and my team faced in collecting clear and valid data during a Virtual Exchange project between Dutch students from Utrecht University and Cypriot students from the Cyprus University of Technology during the Fall semester 2022, using AltspaceVR as a social meeting platform and the solutions that were implemented to overcome difficult technical issues regarding the recording from inside the 3D AltspaceVR world. This paper also functions as a guide for inexperienced language educators that would be interested in conducting similar research utilizing Virtual Reality in their language classrooms.

3. Benefits of VR in Education and Language Learning

Virtual reality has many benefits as it amplifies students' motivation and it stimulates their engagement through the immersive experience[4]. In addition, studies have also highlighted the fact that VR improves students' academic performance and interactions. [5]

4. Why Oculus Quest and AltspaceVR

Oculus Quest and Oculus Quest 2 were chosen as the main HMD as they were available in both universities. Furthermore, Oculus Quest is a stand-alone HMD, very affordable and allows participants to fully immerse themselves in the Virtua World.

AltspaceVR was chosen as it is free to use and its functions would cover the need of the project. In addition, both parties had experience in using this application.

5. The Obstacles and the Methods

Prior to commencing the project two main obstacles had to be addressed in order to conduct a successful Virtual Exchange (VE).

The first one was the familiarization with the Oculus Quest 2 headset and its functions and the second one was the recording of data from the VE from inside the 3D VR environment. In order to successfully overcome this hurdle a CUTing Edge Makerspace team, which was made up of university Information Technology students, was put together to work in collaboration with the researchers to provide solutions for the two major obstacles that were identified as a priority.

5.1 Familiarization with Oculus Quest and AltspaceVR

After participants became familiar and more comfortable with the new technology, they were instructed to create AltspaceVR accounts and Avatars. The major problem that we faced during this step was the creation of outlook accounts so that the participants would be able to connect with AltspaceVR as the application was owned by Microsoft. In order for participants to sign-in into their AltspaceVR application they received a code. This code had to be verified through the Microsoft verify your device webpage. This created some issues as participants were receiving the code in their AltspaceVR app as they were wearing their Quest 2 and had to physically enter the code into their account. This was solved by having participants read out loud their code and staff member inserted the code into the verification webpage.

5.2 The Obstacle of recording from inside the VR environment

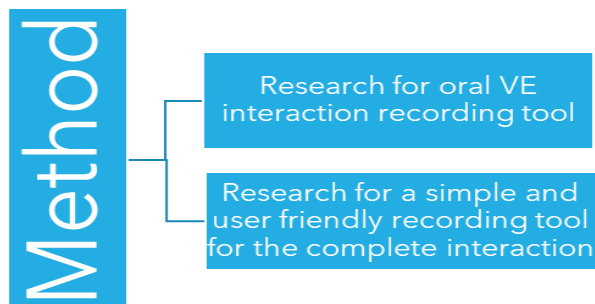
5.2.1 The challenge

From the beginning of the project, Dr. Kristi Jauregi-Ondarra, an experienced researcher in VE[6,7] and project manager for this VE exchange, mentioned the major difficulties she faced in previous VE projects during the recording of the VE oral interactions inside the AltspaceVR world by using external devices such as smartphones. It was a major challenge as a more effective way was needed to enhance the recording quality to achieve an acceptable level of the interactions' recording so that the data that would be extracted would be clear and audible.



5.2.2 The search for a solution

As it was mentioned before that as language instructors our technical knowledge regarding this issue was limited. Nevertheless, having the CUTing Edge Makerspace team, it was decided to initiate a two-pronged search approach to find a solution to the recording challenge. The first prong was to research various online webpages and watch YouTube videos dealing with such issues. The second prong was to identify a simple, free and effective recording tool that would capture the oral and visual interaction clearly.



The first prong led us to the Microsoft webpage, which is the owner of the AltspaceVR. The description of the recording process mentioned on the webpage required a time consuming setup and other software, which was not feasible for the center as the setup was time consuming and it would need additional manpower, which was not available. Furthermore, the webpage description only described the recording from a 2D environment which was not the desired setting. Nevertheless, based in the Microsoft webpage and the various roles that could be assigned to individuals, it was decided that a moderator would enter the interaction to act as microphone inside the VR environment. The moderator was called a “pilot”.

5.2.3 The function of the pilot



Figure3: Pilots in action

The requirement to add a third person a “pilot” into the AltspaceVR environment in order to record the VE required that an additional user had to enter the Altspace VR room with the participants who would conduct the VE. The “pilot” had to create an avatar like the participants and the pilot was named “the Random Guy” in order to distinguish itself from the dyad that would be recorded. The “pilot” was not allowed to interfere or to talk as its function was act as the microphone. However, during the recording the “the pilot” had to be close to the dyad in order to get a clear recording but had to have a distance in order not to be visible during the recording. After creating and inserting the pilot into the



AltspaceVR environment, test recording commenced to establish the quality of the recording and an acceptable distance between the pilot and the VE dyad interaction.

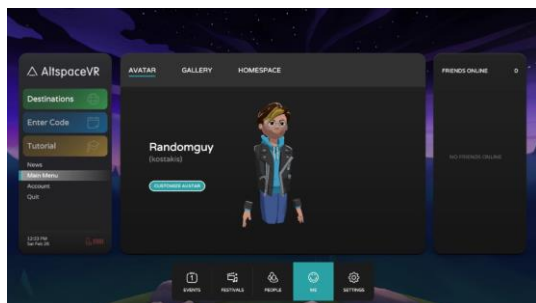


Figure4: Creating the “Random Guy”

5.2.4 The Alt-Z eureka moment

The search for the free and simple video recording tool came to an end as one of the CUTing Edge staff members suggested that we should use a computer that has an NVIDIA graphic card as NVDCards have the capability to record the screen through its Shadowplay program, the GeForce experience.

The program opened the GeForce experience with the Alt-Z combination. The GeForce menu was clear and easy to follow. The program allowed the user to record the screen, take pictures, take screenshots and many other capabilities. Its functions were tested thoroughly, and the program was chosen to be the main recording tool for the VE project as it had to capability to record participants' visual and oral interaction.



Figure5: GeForce Experience

5.2.5 Recording the VE interaction

In order to start the recording, the first VE dyad immersed themselves into the AltspaceVR in 3D mode with the Quest2 VR headsets. The “pilot” entered the AltspaceVR through the 2D desktop environment, as AltspaceVR allows you to enter in both modes. By doing that the “pilot” was able to see the participants and approach them until their voices were audible and clear. Once the conversation was clear, the record button in the GeForce recording tool was utilized to start the recording. After the interaction, the recording was saved in the file that the GeForce user had identified prior to the recording. More than 30 VE recording were successfully conducted and saved with clear and audible VE interactions that made it easy for researchers to transcribe and analyze the data without any interferences.

6. Conclusion

Effective data recording from inside a high immersion VR in language learning such as in VE project can be achieved for any language instructor regardless of the technical background if a support team is present to train the participants and oversee the progress during such recordings. Finally, I think that the technical tools employed in this project go beyond those that are listed in this paper. Investigating other tools is necessary, and the findings should be disseminated.



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