

3 Italian Open Education: virtual reality immersions for the language classroom

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Abstract

This case study describes the development of a free-to-use online platform for storing, sharing, and accessing 360-degree Virtual Reality (VR) videos. Although in the past VR was mostly used for gaming purposes, in recent years it has become increasingly popular in numerous areas, including education. In the field of language learning, little is still known about the development and use of open VR materials as well as their affordances and constraints. The current project addresses this gap by illustrating the practical steps taken to develop an open education platform, by investigating undergraduate students' attitudes toward the implementation of VR in the language classroom, and by discussing pedagogical insights about how openly licensed VR resources can be used to foster students' learning. Overall, this case study revealed that VR Open Educational Resources (OERs) can be powerful vehicles to promote inclusion, innovation, and engagement.

Keywords: virtual reality, open educational resources, Italian, CALL.

1. Context of the project

In recent years numerous technologies have emerged in the field of language learning and pedagogy and educators are integrating technology tools in

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the classroom setting to supplement the traditional textbook and to enhance students' learning (Blake, 2013). Among the latest technologies there is VR, a computer-generated experience that simulates physical presence in real or imagined environments (Van Kerrebroeck, Brengman, & Willems, 2017). While research studies concerning VR in the fields of medicine, history, and architecture abound (e.g. Abdullah, Kassim, & Sanusi, 2017; Fabola, Miller, & Fawcett, 2015; Morandi & Tremari, 2017; Talbot, 2018), in the area of language education only a few studies have looked at the affordances and constraints of immersive VR environments. Lin and Lan (2015) investigated VR research trends in four top Computer Assisted Language Learning (CALL) journals from 2004 to 2013. Results showed that out of 811 published articles, only 29 empirical studies concerned VR. Furthermore, to date there appear to be no studies exploring the creation and use of VR OERs for language education. This dearth of studies prompted this author, a doctoral student in Second Language Acquisition and Teaching and Italian instructor at the University of Arizona, to develop a platform named Italian Open Education (<https://italianopeneducation.com/>), an independent project which offers a collection of openly licensed and open access 360-degree VR videos. This new tool was conceived to help Italian language learners better understand, at no expense, the many facets of the target culture which is frequently presented in a static manner and as factual information in traditional language textbooks (McConachy & Hata, 2013).

2. Intended outcomes

The main purpose of Italian Open Education was to support and enhance language learning using innovative resources which would not financially burden students. The platform was specifically developed for Italian students, whether enrolled in language courses or studying Italian on their own. Six specific outcomes were set:

- to produce new 360-degree VR materials tailored to the study of the Italian language and culture;

- to provide language teachers with openly licensed innovative pedagogical resources which promote cultural awareness;
- to provide language students from different backgrounds and socioeconomic statuses the opportunity to be included and participate in conversations regarding the target culture;
- to understand students' attitudes and beliefs toward the use of open VR resources in the educational setting;
- to increase students' engagement; and
- to provide individuals all over the world the opportunity to explore the Italian culture at no cost.

In order to achieve these goals, the author recorded 360-degree VR videos in Italy, uploaded them on YouTube, marked them with a Creative Commons (CC) Attribution-NonCommercial-ShareAlike 3.0 License (CC BY-NC-SA 3.0), and shared them on the online platform. Other videos recorded by YouTube users, which either have the above-mentioned CC License or a Standard YouTube License, were gathered and shared on Italian Open Education. After the platform was launched in September 2018, students enrolled in beginner and intermediate Italian courses used such resources to explore Italian settings in their multiple facets and participated in teacher-led discussions to foster cultural awareness. Data from students was collected to further understand how VR OERs might be integrated in the language classroom.

3. Nuts and bolts

VR has the potential to transform language education since it offers users the opportunity to be immersed in authentic experiences otherwise inaccessible due to geographical constraints. Nowadays, most students are not able to study abroad and authentically explore the target country. VR OERs, which can be

reused and adapted according to teachers and students' needs, promote inclusion by allowing students to be virtually immersed and physically present in non-physical yet culturally authentic environments (Blyth, 2018) and further develop their awareness of the target culture. Several steps were followed to develop, launch, and use Italian Open Education.

3.1. Recording and creating 360-degree VR videos

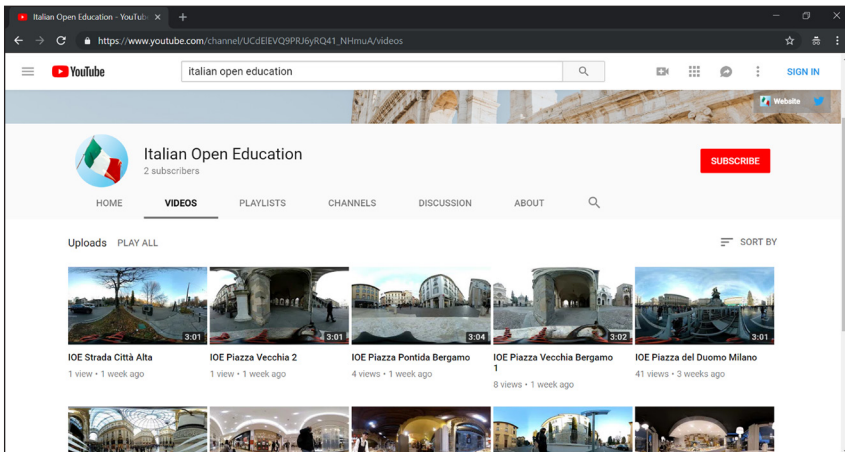
In order to create 360-degree VR videos, special equipment was purchased by the author. The Xiaomi Mijia Mi Dual-Lens Sphere 360 Camera was the chosen tool to be used in Italy to record authentic environments. This camera features a 360-degree field of view which captures an entire environment, in any direction, as opposed to conventional digital cameras which produce videos by focusing on one fixed angle.

In December 2017, this author flew to Italy and recorded many videos using the 360 camera in her hometown Bergamo, as well as Milan. The choice of locations to record was dictated by the desire to show students everyday Italian environments (e.g. a plaza, a coffee shop, a restaurant, a mall, a street, etc.) as well as some environments that are commonly represented in Italian textbooks (e.g. Galleria Vittorio Emanuele II in Milan). The camera was placed in strategic locations within the environments and it was remotely controlled through a smartphone. Videos were recorded for about 3 minutes so that when viewed by students the various Italian settings would appear lively and in movement, as opposed to a static image or a very short video. A total of 14 videos were recorded.

The videos were transferred to a laptop and processed with the Spatial Media Metadata Injector software (<https://github.com/google/spatial-media/releases/tag/v2.1>), an open-access YouTube software which adds metadata to a video indicating that the file contains a 360-degree video. The videos were uploaded to a dedicated YouTube channel named 'Italian Open Education'. To facilitate web searches, videos were named 'IOE' (the acronym of the platform) along with the Italian word of a specific environment, for instance 'piazza' or 'ristorante'. Videos

on YouTube were shared under the education category and marked with a CC BY-NC-SA 3.0, which allows users to adapt the resources for non-commercial purposes and share them with the same license, while still giving appropriate credit to the author. Figure 1 shows the Italian Open Education YouTube channel (https://www.youtube.com/channel/UCdEIEVQ9PRJ6yRQ41_NHmuA).

Figure 1. The Italian Open Education YouTube channel



3.2. Creating the Italian Open Education platform

The Italian Open Education platform was developed by the author on WordPress (<https://wordpress.org/>), a free and open-source content management system based on PHP and MySQL. WordPress was chosen for this project for its simple interface and the numerous plugins and templates available which reduce development costs and deployment time. The platform focused on collecting 360-degree VR videos that represent Italian environments as well as instructions on how to create, access, and view the videos. First, the 14 videos previously recorded in Italy were organized in different categories and embedded in the platform. Following, additional 360-degree VR videos representing Italy were searched on YouTube. Although most of the found videos had a Standard YouTube License, some videos presented a CC License signifying that

individuals are sharing innovative digital content with the desire of making such resources accessible and adaptable to others. The newly found videos were also categorized and embedded in the platform. Each video was briefly described in Italian along with the type of license which characterized them, and the authors of the videos were credited.

Since VR is still an emerging technology in the field of language learning and pedagogy, two specific web-pages addressing how to use the videos and the equipment needed to view the resources were created. A ‘How to’ (<https://italianopeneducation.com/how-to/>) web-page was created to provide a step-by-step explanation of how to view the content in VR. The web-page explains that users need to download the YouTube app on their smartphone, open any 360-degree video in the app (using the keyword ‘360’ before the name of the environment facilitates finding 360-degree videos; e.g. 360 street), and click on the small headset icon on the bottom right of the video. The smartphone screen will then divide in two, giving users a sense of depth once the device is inserted in a headset such as Google Cardboard (<https://vr.google.com/cardboard/>). Although there are many VR headsets on the market, Google Cardboard is among the most economical ones and when utilized with a smartphone and specific applications (e.g. YouTube) it creates a stereoscopic effect, which adds an illusion of depth to a flat image and gives users the illusion of presence in virtual environments.

Last, the ‘Equipment’ (<https://italianopeneducation.com/equipment/>) web-page on the platform addresses the tools that are needed to experience VR environments as well as the specific equipment that was used by the author to create VR resources. To view the 360-degree videos in VR, users need a smartphone, the YouTube app, a simple viewer such as Google Cardboard, and optional headphones to create an even more immersive experience.

3.3. Students’ attitudes and beliefs

VR supports language educators by giving them the opportunity to engage students in experiential learning, that is, the process of learning by doing (Kolb,

1984). Students are immersed in 360-degree authentic virtual environments and can move their head in any direction and choose where to focus their attention, thus creating personalized learning experiences. Rather than telling students what to think about the foreign culture, with VR, students are given the tools and materials to compare, contrast, and discover cultural insights. The opportunity to experience the target culture by being highly immersed in authentic virtual environments is without precedent. This open platform promotes inclusion since it provides equal access to authentic virtual experiences and it is especially beneficial to those students who are not able to study abroad since it supports cultural learning in immersive environments of the target country.

Considering the paucity of studies investigating the use of VR for language learning, this project also aimed at exploring undergraduate students' beliefs and attitudes toward the use of 360-degree VR videos in the classroom setting. During a grant-funded, student/faculty interaction out-of-class event, 14 students enrolled in beginner and intermediate Italian courses were given a Google Cardboard headset each and were instructed on how to use such a device.

Prior to viewing four immersive 360-degree VR Italian environments, participants completed a survey designed to assess their experiences with technology for language learning as well as their interest and knowledge of the target culture. Participants stated having not used VR in the language classroom or for other educational purposes. All 14 (100%) students reported that technology enhances language learning and that when used in the classroom it is enjoyable and fun. All participants also reported that studying the Italian culture is important to them, however, only 32% felt familiar with the target culture.

Next, participants explored four 360-degree VR videos with the use of their smartphones, Google Cardboard, and headphones. Prior to each video, participants were told about the environment they were going to see (i.e. a street in Florence, an opera theater in Modena, a bakery in Bergamo, and a plaza in Milan) and they were asked to write a pre-reflection about colors, sounds, materials, and people that they expected to see. The pre-reflections helped students explore their understanding and perhaps their stereotyping of Italian

environments before the viewings occurred. After each viewing, participants wrote post-reflections, explained whether what they saw was similar or different from what they previously expected, and expanded on their own virtual experience.

Students then participated in teacher-led conversations addressing the cultural aspects of the experienced environments. Discussions and written reflections revealed that by using VR OERs, participants noticed unique cultural layers that they might not notice in traditional pedagogical resources. For instance, students were surprised by the dimensions of buildings and how narrow streets were. The height and width of an environment particularly stands out in VR since everything appears in real-life dimensions, an impressive feature that traditional ‘flat’ videos do not have. When students were told that they would be virtually standing in an Italian bakery they wrote that they expected to see pastries, desserts, and a baker with a white hat. However, in Italy, most bakeries (in Italian ‘panetteria’) sell bread and savory foods, such as pizza by the slice, thus the viewing took students by surprise. Students also expected to see artifacts ‘everywhere’ while exploring the street in Florence. Instead, students were surprised by the modest street without as much art as they anticipated. These particular cultural aspects, usually noticed when travelling abroad to a foreign country, are freely available today to language students in the classroom through VR OERs.

Lastly, participants completed a post-survey where they expressed attitudes and concerns about the potential use of VR materials in the educational setting. All participants stated that the virtual experiences were useful to understanding more about Italy, 65% were interested in using VR in the classroom context, and 84% reported that the experience increased their motivation and engagement. A participant stated that such virtual experiences brought her Italian instructor’s cultural explanations to life, while another participant reported that, unlike regular classroom lectures where everything is filtered through a teacher’s point of view, VR gives individuals the opportunity to focus on whichever detail catches their attention. This experience created involvement and participants felt as if VR provided them with a more accurate depiction of Italy than the traditional textbook.

Participants also discussed potential drawbacks of using VR technologies in language education. Some students felt dizzy after the third viewing, while others were concerned with the possibility of VR becoming a distracting technology which might take away from learning. This interesting observation is certainly important since, as educators, we need to carefully examine how technology tools can enhance students' learning as well as pedagogical content before fully implementing new technologies in language courses.

4. Conclusion

Researchers in the field of CALL have started to investigate theoretically grounded principles to comprehend the pedagogical value of highly immersive virtual reality for language learning purposes (Lin & Lan, 2015), nonetheless this area remains largely unexplored. Today's ubiquitous technologies allow educators to become creators of innovative pedagogical content. In an effort to promote the Italian culture and to create previously inaccessible experiences for language learners, the author developed Italian Open Education, a one-of-a-kind platform that offers VR OERs for students and teachers across the world. The platform was launched in September 2018 and in less than two months it received 552 page views and 77 visitors from various countries such as the United States, Switzerland, Canada, Italy, China, Australia, Belgium, and many more. The VR OERs were tested with language students who were able to 'travel' to Italy, experience, and explore the target culture from the classroom setting. The digital materials marked with a CC License found on Italian Open Education can be reused and adapted, provided that they are shared with the same license and the original source is acknowledged. By sharing open resources, innovation and inclusion can be fostered while supporting students' learning and engagement. This project did not address in what ways highly-immersive VR videos enhance learning more or differently than regular videos, thus further research is needed to explore the similarities and differences between the two. Additionally, the 360-degree VR videos used in this project allowed users to focus their attention on what they preferred, but such videos do not allow for interactions (e.g. entering in specific places, touching objects within the environment, speaking to people,

etc.). Further research is needed to shed more light on practical applications, affordances, and constraints of VR OERs in language education.

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