

# Virtual Reality in Linguistic Teaching to Immigrants

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## Abstract

The purpose of this study is to evaluate the opportunities and limitations of virtual reality for language teaching for migrants in everyday life situations where the significance of cultural background can also play a lateral role. To develop this virtual reality tool, a co-creation approach was used, involving two types of end-users: immigrants and refugees, as well as teachers and facilitators from three different parts of the world. Europe: Catalonia, Germany and Greece. To assess opportunities and constraints, a mixed qualitative and quantitative approach will be used, where end-users will be interviewed and a questionnaire will be administered to collect their evaluations. In this approach, analysing the responses from the user's perspective is essential for continuous improvement. This research is part of the European project WELCOME (Multiple Intelligence Conversation Agent Services for Reception, Management and Integration of Third Country Nationals in the EU), which aims to use technology to support the reception and integration of migrants in Europe. The results obtained from this study will help developers associated with the project to improve the technology and virtual reality to make it more accessible and user-friendly for migrants and serve as a language acquisition tool in real-life situations.

## INTRODUCTION

The number of refugees worldwide has reached an all-time high of 25.45 million. In 2015 and 2016 alone, more than 2.5 million people applied for asylum in the EU. The figures decreased significantly in 2017, 2018 and 2019, but increased again in the first months of 2020. This means that the reception and integration of third-country nationals remains a major social problem in many EU countries. The WELCOME project aims to solve this problem. We develop engaging, intelligent systems that act as personal assistants for migrants and refugees and collect information to support decision-making by host governments.

WELCOME addresses the following innovation objectives:

1. Co-design of technologies for the reception, integration and inclusion of migrants and support for Administrations
2. Development of intelligent conversation technologies for service coordination and interaction management.

3. Development of multilingual language technologies
4. Design of knowledge representation schemes and development of knowledge acquisition and interpretation technologies
5. Creation of personalized interaction environments between migrants and support and accompaniment agents
6. Provision of a decision-making support system for Administrations

WELCOME will validate the developed platform as a whole and in each of its technologies through three different use cases: (1) Reception and orientation of third country nationals; (2) Integration of third country nationals; (3) Support for third country residents in the receiving country; and (4) In the three use cases, Administrations will be provided with decision-making support technologies.

In the reference framework of the WELCOME project, the use of virtual reality for the acquisition of language skills by third-country nationals is an important first innovation. Therefore, virtual reality tools relevant to everyday life situations are being developed with the aim of providing third-country nationals with the necessary language tools to enable them to function autonomously in the host society. End-users have always been involved from a co-creation perspective, and the most common situations in which language difficulties arise are identified by teachers specialised in teaching languages to foreigners. As a second aspect related to innovation, we can point out that, in relation to language learning, the cultural context is being taken into account while supporting third-country nationals in acquiring knowledge related to the cultural habits and customs of the host society.

#### **LANGUAGE LEARNING THROUGH THE USE OF VIRTUAL REALITY. CURRENT CONTEXT.**

There are currently many apps and online tools available that facilitate the learning of a foreign language. In the framework of the WELCOME project, the most popular apps on the Spanish market have been tested in order to take language learning to a level not covered by other apps.

Testing is carried out taking into account the requirements and needs of the end-user; to identify aspects and needs not covered by current tools. The advantages and barriers for each application studied are listed below. The apps have been tested on iOS versions on iPhone and iPad (Duolingo, Drops, Word of the Day, Babbel and Mondly). The duration of each test within each app ranged from 3 weeks to 3 months. Mondly and Babbel were tested by computer on the web version. The main findings are as follows:

##### ***Duolingo***

Duolingo is one of the world's most popular language learning apps. It is available in several languages and its free version covers all levels (Garcia, 2013; Jašková, 2014). It is necessary to create a personal user profile, collecting the user's personal information, native language, languages to be learned and the user's progress through the different courses and levels. The Duolingo English Test is a computer-adaptive test (CAT) of English language proficiency that is administered and scored totally online (Wagner, 2020). According to LaFlair and Settles (2019), scores on the DET reflect the English language ability of test-takers, and these scores are used for many purposes, "including for university admissions decisions" (p. 3). For this review, I will focus on the use of DET scores for admissions decisions for English-medium universities.

Positive aspects of the APP: (1) The free version covers a wide range of topics and levels; (2) Available in several languages; (3) Attractive visual appearance; and (4) Simple user interface.

Negative aspects: (1) Limit of errors per day: users of the free version are only allowed a certain number of errors in their daily activities. They cannot finish the course once they are exhausted. Three errors occur every day; (2) There is no particular exercise for learning the alphabet. It is a great challenge to overcome the basic level when using a non-native alphabet without the help of other external resources; (3) Because writing and pronunciation exercises are introduced so early in the course, it is easy to make mistakes and then not be able to complete the exercises because the course has been blocked. Low levels of literacy make it easy for people to lose motivation; (4) Users must respect the marked course itinerary; they cannot practise a topic of interest in the course at will. Re-practising material previously covered is allowed, but you will not be able to advance according to your interests or needs.

In conclusion, duolingo is a useful tool for those who already know a language but want to improve their skills. It requires competent writing and reading skills; exercises involving pronunciation may contain errors due to the voice recognition function. Due to the steep learning curve at the beginning, users with very little knowledge of the language may become demotivated.

### **Drops**

The main emphasis of Drops is on simple expressions and vocabulary (Cahanaya et al., 2020). In the paid version of the app, you need to create a user profile which keeps track of your native language, your progress in the various lessons and allows you to set the lesson duration. In the free version there can only be one 5-minute lesson per day.

Positive aspects of the APP: (1) A free version is available; (2) It is available in many different languages; (3) It includes a large number of languages; (4) There is a lot of visual; (5) The student is free to select the topics in any order in which to practice; (6) It contains a glossary of terms learned, which can be looked up in both the target language and the learner's mother tongue; and (7) It contains an exercise related to the alphabet.

Negative aspects: (1) The free version limits daily practice time to five minutes; (2) It does not provide examples of completed dialogues; (3) There are no clarifications or opportunities to practise grammar; and (4) In some cases, the way in which terms are presented may not be well organised. When pronouns are taught, for example, not all personal pronouns are taught in an orderly way; instead, they are mixed with possessive pronouns, which can cause confusion for the learner.

In conclusion, suitable for users with no prior knowledge, Drops is an application that helps users learn basic vocabulary in various languages. It covers basic topics such as the alphabet and simple phrases. Once the user masters the fundamental vocabulary, further instructions are required to cover other topics that the app does not cover, such as grammar or oral interaction.

### **Word of the Day**

With this APP, we can choose the languages in which we want to learn a new word every day. You can select between British and American English in the free version, which only offers English vocabulary. There is no need to complete any registration details or create a learner profile. The application is very easy to use and each day a new word is sent to the user to help them expand their vocabulary. The user selects the English language variety of their choice. To create a learning context, the word of the day is displayed along with a succinct definition and one or two sentences that use it. The application has a calendar that allows users to view all previous words in reverse chronological order. Users with an intermediate level of language proficiency who want to increase their vocabulary easily and quickly should use this app.

Positive aspects of the APP: (1) Installation and access are easy because there is no need to create user accounts; (2) It can be used on both iOS and Android mobile devices; (3) It offers the option of listening to how the words provided are pronounced; (4) Gives information on the etymology of the term; and (5) It provides applicable illustrations to help us incorporate the term into our everyday vocabulary.

Negative aspects: (1) There are no customisation options or learning levels; everyone uses the same system at the end of the day; (2) It requires a medium-advanced level of proficiency in the language, in this case English. Most of the vocabulary words are cult or uncommon. Even for native speakers, the aim is to expand their vocabulary; (3) Only the British or American versions of the free version are offered. The word of the day cannot be selected in any language other than English.

In conclusions, The Word of the day application is interesting for those users who, having an intermediate-advanced level of English, want to incorporate new terms to their vocabulary in a simple way that is hardly time-consuming. It is not recommended for users with an initial knowledge of the English language as the terms used are not commonly used.

### ***Babbel***

There are two levels available for most of the 13 languages offered by Babbel: basic and intermediate (Nushi & Eqbali, 2018). It is among the most widely used applications worldwide. It consists of a multi- device platform compatible with tablets, smartphones and PCs. The user's choice of language and the reason for learning (for study, work, travel, etc.) is made at the time of registration. The user's choice of language (for study, work, travel, etc.), how much they have previously learned about the language (there are three options: none, some and a lot), and how much time they want to spend each day learning the new language (this can range from five to sixty minutes).

Positive aspects of the APP: (1) Up to 14 languages are available and many of them offer beginner and advanced learning levels. For languages that only offer one level, that level is either beginner or basic; (2) The application offers support in audio format at the basic level, which is helpful for learners at that level. It is mainly very visual; and (3) It can be accessed from a computer, tablet or smartphone because it is compatible with multiple devices.

Negative aspects: (1) Classes are grouped by subject, navigation between classes is not completely free and access to courses in the free version of the programme is very limited. You can only take one course per day. You must cancel your subscription to unlock additional courses; and (2) There are no basic early vocabulary or structured alphabetical activities. This is especially important if you are trying to learn a language that uses a different alphabet from your mother tongue.

In conclusion, the resources available in the free version are very limited. For students with no previous knowledge of the language, the learning curve is quite limited. It is generally recommended for students with some prior knowledge of the language.

### ***Mondly and Mondly Augmented Reality.***

Mondly is a language learning platform with an app that can simulate conversations with robots in augmented reality. Users can register for free on the website or download the app on their tablet or smartphone. The site offers courses in 33 languages. In the free version, learners can only register for one language. To access more languages, you must purchase a paid subscription. This platform is complemented by an app called Mondly AR for tablets and smartphones. The app allows students to interact verbally with the bot in augmented reality. The free version of the app only allows students to

access the first lesson and practice basic greetings. The remaining lessons are unlocked by purchasing the paid version. This app allows you to practice speaking in a simulation of a real environment.

Positive aspects of the APP: (1) There are 33 languages available, but the free version only allows students to register for one language; (2) The free version allows you to take several lessons per day. - Apps for tablets or phones suitable for children's language learning; (3) Possibility of complementing traditional courses with augmented reality learning; and (4) Provides simple grammatical explanations, including conjugation of particular verbs.

Negative aspects: (1) The content available in the free version cannot be explored for free. You must complete the course to progress through the content; (2) It is difficult to learn a language using a non-native alphabet because there are no; (3) basic activities to learn the alphabet; (4) No prior knowledge of the language is required and translation or pronunciation activities are provided immediately even at the basic level, motivating students with limited prior knowledge of the language; and (4) The free version offers some augmented reality application features.

In conclusion, of all the applications analysed, Mondly with its augmented reality application is the most advanced in terms of new technologies used in language teaching.

### ***Other findings from the literature review.***

Regarding the virtual reality issues found in the literature review, it is worth mentioning an article from 2021 by Anke Burns and Salvador Reyes-Sánchez that analyses virtual reality in language learning. One of the most important conclusions that can be drawn from this study is that there is a need to find new ways to maximise the use of virtual reality in language learning, depending on the level of immersion of the learners as well as the immersion of the learner. Interaction. This is because adaptive learning, combined with a learner-centred learning model, is the field of work that enables the development of artificial intelligence. Likewise, authors such as Noelia Moreno, Juan José Leyva, María del Carmen Galván, Eloy López and Francisco José García demonstrate the need to integrate language and culture in these virtual environments. Most of the applications reviewed require a previous level of literacy and the use of prior skills. It can be concluded that the target group for such support are mainly learners who know a second language and want to learn a third language or who want to improve or update their language skills. Most of these apps are comprehensive, meaning that you can read several languages using a single app, although they are not limited to a specific language (except Chinese or English).

None of them target migrants, refugees or asylum seekers with low literacy, technical skills or limited mother tongues who need to acquire a variety of language skills to function freely in the host society. With another alphabet.

### **CO-CREATION AND METHODOLOGY APPLIED IN THE PROJECT**

The main objective of the WELCOME project is to develop systems that contribute to the integration of third-country nationals, migrants and refugees in host countries. To this end, a co-creation methodology was used, consisting of weekly co-creation sessions between experts from organisations that interact directly with migrants and refugees, mainly NGOs, public services and technical experts. The meetings were held virtually due to the COVID-19 situation and were the main method of gathering user requirements used in Phase 1 of WELCOME. These meetings focused discussions on the specific needs of target groups and organisations working with migrants, refugees and asylum seekers, sometimes guided by specific questions from technical partners. In parallel to the

co-creation sessions, organisations working with end-users highlighted their current needs and requirements, highlighting the differences, similarities and common requirements between different types of public and private organisations and demonstrating the most common requirements. There is a need to equip migrants and refugees with language skills to enable them to cope with situations that often arise in everyday life in host countries. The cultural context is also considered for innovation, as compatibility between language use and social conventions is important for developing immersive and realistic virtual learning environments.

After collecting user requirements and technical developments from the developers, user tests are carried out with real citizens from third countries, where the virtual reality modules developed in the WELCOME project are tested in three languages: Catalan, German and Greek. . The module combines language activities with mini-games covering aspects of language and culture to develop real-life situations faced by migrants, refugees and asylum seekers. User feedback is very important at this stage. To collect this feedback, a questionnaire was developed asking participants about socio-demographic aspects (age, gender, country of origin, mother tongue, educational level) and aspects such as technical skills or knowledge of other languages. We asked them about their assessment of the virtual reality module and other aspects of the applications developed in the WELCOME project. In accordance with the Personal Data Protection Act, the answers will be anonymous or pseudonymous and all participants will sign a prior consent form.

## RESULT

We then conducted pilot tests and statistically analysed the data. The following correlation is expected to be established. Differences in assessments related to demographic factors: This data was analyzed to examine whether there are significant differences in the assessments of virtual reality (VR)-based technology concerning gender, age, educational level, previous digital skills, and languages mastered by migrants, refugees, or asylum seekers. This analysis assists in understanding how these demographic characteristics influence the perception and acceptance of VR technology within these groups.

Differences in activity outcomes related to demographic factors: Apart from assessments, the study also identifies differences in activity outcomes associated with gender, age, educational level, previous digital skills, and languages mastered by the respective groups. This information provides insights into how these demographic characteristics affect engagement and outcomes from using VR technology in this context.

Barriers to technology use: The research also examines potential barriers encountered in using VR technology, particularly those related to obtaining the technical and economic requirements necessary for acquiring virtual reality equipment. This information is crucial as it aids in strategizing ways to overcome these barriers, consequently enhancing technology adoption.

Differences in the experience of various languages: Analysis is also conducted on the experience in various languages such as Catalan, Greek, and German in using VR technology. This can reveal whether there are significant differences in the user experience of the technology among the different languages used.

Availability of VR modules focused on foreign language learning: One of the focal points of this research is to identify the availability of virtual reality modules that aid in foreign language learning for end-users. This analysis provides insights into the extent to which VR modules for foreign language learning are accessible and available to end-users.



The comprehensive nature of this analysis underscores the intricate relationship between demographic factors, technological barriers, and the utilization of VR technology in the integration process. Understanding these relationships is pivotal for crafting targeted strategies aimed at fostering enhanced technology acceptance and successful integration of migrant, refugee, and asylum seeker communities into host societies.

In conclusion, the findings underscore the need for nuanced approaches to address the diverse needs and challenges faced by these communities. Tailoring VR technology initiatives to account for demographic variations, language preferences, and mitigating technological barriers can significantly contribute to more effective integration strategies and improved outcomes for these groups within host communities.

## CONCLUSION

Most language learning apps are aimed at students or people who already know a language and want to improve their knowledge and skills or learn another language after mastering a second language. Although intended to be interactive and visual, they are not designed for migrants, refugees or asylum seekers with different needs and interests. In their case, they are not looking for a language certificate or to improve their knowledge of a foreign language, but for knowledge and skills to work autonomously in the host society. Research has shown that virtual reality brings the general context very close to reality by integrating real spaces and situations, using artificial intelligence and introducing cultural issues into real-world situations. The inclusion of cultural aspects and the focus on students and people from third countries with different needs are new features of the WELCOME project, which aims to create a useful tool for the reception and integration of migrants and refugees in the Host Country.

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