

NAVIGATING BETWEEN LANGUAGES AND CULTURES: AUGMENTED REALITY VS. TRADITIONAL LEARNING

Raffaele Di Fuccio ¹, Maia Sushchevskaia ^{2*}

¹ Pegaso University; raffaele.difuccio@unipegaso.it

² University of Foggia; maia.sushchevskaia@unifg.it

* Correspondence: maia.sushchevskaia@unifg.it

Abstract: In the rapidly evolving digital era, the integration of augmented reality into Second Language Learning (SLL) appears as an innovative and promising domain that has the potential to revolutionize traditional teaching methods and to open new perspectives for the development of linguistic competencies and cultural heritage knowledge. Within the Gameland project, an augmented reality (AR) app was designed to help foreign and Erasmus students to learn a L2 and to make the process of studying more efficient and engaging than the usual methods used to be. The conducted research consists in measuring the progress of the students that will be using specially designed conceptual maps, powered by AR, based on each student's language level according to the Common European Framework of Reference (CEFR) and the cultural heritage knowledge of the host city in comparison with the ones that will be exposed to traditional learning techniques and materials (such as textbooks, educational videos, etc.). The incorporation of cultural heritage in Second Language Learning through augmented reality not only enhances linguistic proficiency but also fosters a more comprehensive and profound understanding of the language. This immersive approach enriches vocabulary, refines grammar, and facilitates direct application in practical contexts, elevating the language learning experience for students. The paper shows the results of a focus group with 8 students that used the author system for the development of new AR conceptual maps using the Gameland software.

Keywords: Second Language Learning (SLL); augmented reality (AR) tool; immersive experience; cultural heritage; Gameland.



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1. Introduction

In a world where pioneers once carved paths with limited resources, today's challenge lies in navigating an abundance of possibilities. Just as early humans faced the uncharted territory with perseverance, now our quest for innovation in language learning encounters the vast landscape of existing tools and methods. Amidst a sea of resources, our language learning tool aspires to be a modern pioneer, charting new territories in education by leveraging Augmented Reality (AR) and redefining the boundaries of linguistic and cultural exploration. (Parmaxi & Demetriou, 2020; Fan, Antle & Warren, 2020; Majid & Salam, 2021)

In the swiftly advancing digital age, the integration of AR into Second Language Learning (SLL) appears as an innovative and promising domain that has the potential to revolutionize traditional teaching methods and to open new perspectives for the development of linguistic competencies and cultural heritage knowledge (Cai, Pan, Liu, 2022). This study is situated within this dynamic context, focusing on the application of augmented reality within the Gameland (Gamification Assets for Multi-sensorial Educative tools in Language learning using co-creation for Addressing Needs and Desires of students) project.

Our intervention lies in Italy, and it follows a brief analysis of the Erasmus plus program in Italy. Higher education in Italy, with its 10.3% of international students, becomes a vibrant crossroads of diverse cultures and languages, where 76.6% are part of the Erasmus program, emphasizing Italy's significant role in international mobility. For foreign and Erasmus students, learning a foreign language represents a unique opportunity to immerse themselves in the culture of a chosen country. In this context, a well-designed learning tool plays a crucial role.

This study aims to examine the impact of an augmented reality app developed within the Gameland project and the perceptions of the Erasmus students in using that application. Through the analysis of interactive conceptual maps based on students' language levels according to the Common European Framework of Reference (CEFR) and their knowledge of the cultural heritage of the host city, we intend to evaluate students' opinions on the Gameland platform.

The main objective of our work is to drive the future exploration about how augmented reality application can enhance efficiency and engagement in studying an L2 while simultaneously enriching cultural understanding. Our target group comprise foreign students and Erasmus students, - they will be divided in 1 group for the focus group.

Expected conclusions revolve around the positive impact of augmented reality in the realm of language and cultural learning compared to the textbooks traditionally used in teaching. This approach is anticipated to enrich vocabulary, refine grammar, and promote practical application in everyday contexts, ultimately enhancing the overall language learning experience for students. According to cognitive linguists,

language structure goes beyond individual words and grammar components, emerging through the interaction of perceptual biases and statistical structures in input, as highlighted in studies by Tyler & Ortega (2018) and a consistent body of work (Ellis et al., 2016). This understanding of language structure as extending beyond isolated components influenced our decision to link the app to real-life and contextual situations, aligning with the insights from cognitive linguistics.

2. Methods and Materials

2.1. Gameland platform: an authoring tool

The research methodology employed in this study involves the application of focus groups (Thomas, Frankland & Bloor, 2000) held in the city of Lecce after a period of 1 week for a free creation of new scenarios using the Gameland software.

The Gameland software enabled the user to create their own map, adding the voice.

The task assigned to the participants was to create a map of a cultural aspect emerged in their presence in Italy. Gameland uses an innovative approach characterized by the following equation (Figure 1):

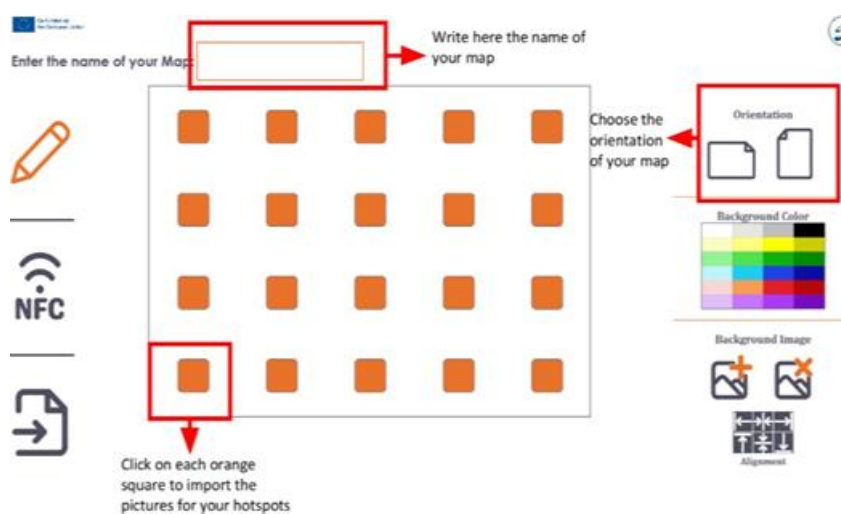
Figure 1. Gameland approach



This method combines various scenarios and modalities to foster spontaneous and flexible learning, enhancing participants' linguistic and cultural skills.

Structured activities within Gameland are designed around real-life situations, facilitating the practical application of language in everyday contexts. The learning path integrates diverse elements such as texts, images, videos, interactive maps, and audio, creating a multisensory experience. Tailored for foreign university students and those participating in the Erasmus+ program, Gameland enriches their academic journey with a dynamic and culturally integrated approach. The foreign students were asked to create their own conceptual map using the Gameland authoring tool (Figure 2).

Figure 2. Gameland authoring tool: this dashboard allows the users to create their own conceptual map mediated by augmented reality.



The authoring tool allow the development of a conceptual map (Amadiieu, Van Gog, Paas, Tricot, & Mariné, 2009) where the students could select the exact point in the map and connect to it a multimedia file that could be a video or an audio. The audio could be auto recorded by the students. Once the map is completed (Figure 3) the student could share the results in their L2 class. The conceptual map is playable by a mobile Android phone. The student browses the map with its mobile phone, using the Bring Your Own Device (BYOD) approach (Afren, 2014) and has the possibility to move the phone on different pinpoints. If the phone is on one of them, on the device starts a question or tips to gather the new point and to proceed in the map, and then in the learning. The interaction methodology is inspired to previous studies (Mazzucato & Argiuolo, 2021).

Figure 3. An example of a conceptual map created using Gameland authoring tool



Powered by the STELT program (Di Fuccio et al. 2016), the Gameland app provides an advanced learning experience: interactive speaking maps, connected to realistic scenarios, enable NFC sensor interactions on smartphones (at the moment, available exclusively on the Android devices), optimizing linguistic and cultural proficiency. STELT utilizes Radio Frequency Identification (RFID) technology to transform physical materials into intelligent objects, fostering an engaging learning environment (Miglino et al., 2014). The tool emphasizes personalization, enabling the creation of customized scenarios, an intuitive interface, and seamless interaction between interactive maps, serious games, and students.

As for the materials, the selection of words presented to the students was aligned with different levels of language proficiency outlined by the CEFR. The researchers presented some materials as inspiration and meticulously selected vocabulary, grammatical structures, and cultural themes, according to individual student levels, ensuring a targeted learning experience tailored to their specific language skills. Given that the study was conducted in Lecce, the topic of the first intervention is linked to the culture of the region of Puglia, precisely Salento. Denominated “Salentino Starter Pack”, our intention is to make every foreign student feel a real “salentino”, by providing them essential knowledge for every true Italian of the zone. The Salentino Starter Pack will be designed for learners at different levels. The first map was developed for the Intermediate Level (B1), that offers an enriching linguistic and cultural experience. Delving into the Salentino dialect, learners will encounter typical expressions and phrases that encapsulate the local flavor. Moving beyond language, the pack explores the intricate baroque art found in Lecce's churches, highlighting the rich cultural tapestry. Additionally, the advanced vocabulary encompasses the world of refined enogastronomy, featuring renowned names like "Negramaro" and "Primitivo." The linguistic journey advances into complex grammatical constructions, such as the use of present and past subjunctive, conditional structures, and combined pronouns; and also, make the learners use the basic grammar, already studies previously. Beyond language intricacies, learners explore the historical and linguistic origins

of the Salentino dialect, including the unique rule of adding "u" to many words. The pack also delves into the Greek and Byzantine influences that persist in Salento culture, exemplified by villages in the Greece of Salento where Greek is still spoken. The exploration extends to artistic representations in baroque churches, showcasing frescoes, murals, and the distinctive Lecce stone. Finally, the pack sheds light on the significance of the Taranta festival, underscoring its pivotal role in the local musical tradition.

All of those elements worked as an inspiration for the students in their interaction with the authoring tool.

2.2. The focus group

The participants in the focus group, that was organized in a single session in Lecce, are 8 (4 males and 4 females), in line with the Krueger (1997) traces. Participants were aged from 20 to 24. In this group, 1 has a language proficiency in Italian that is at A2 level, 4 of them has B1 level, 3 have a B2 level. Focus groups are a qualitative research method whose objective is to explore in detail the aspects covered. All the participants were students enrolled in Erasmus exchange programs and they are foreign students in the University of Salento for their period abroad. The focus group was conducted by 2 researchers: a researcher was the moderator, and the other acted as observer.

The focus group was organized with a discussion along two main directions that involved: linguist proficiency advancement and cultural enrichment and immersive learning. In the discussion the themes emerged was labelled by the researchers and are: grammar advancement in Italian, discussion on the levels about the Common European Framework of Reference, communication inside the groups, the cultural understanding, the AR involvement and the connection between the exercises and the *real-life contexts*.

In the initial phase of our study, we meticulously designed and conducted sessions involving eight diverse participants, including Erasmus and international students. Their active involvement was instrumental in obtaining preliminary results and identifying intricate details that may only surface during hands-on experimentation. These sessions were invaluable, serving as a crucial step in refining the app's functionality. Participants connecting their learning experiences with real-life situations, as highlighted by Macquire, Frith, and Morris (1999), retained more material, making their engagement in the creation and testing process even more impactful. Furthermore, the focus on what is personally important to students, as emphasized by Cahill and McGaugh (1998) and Sousa (2006), drives memory retention. When students have the immediate opportunity to practice the language they are learning within the app, without the need to seek external contexts, it becomes highly motivational. This aligns with Sousa's notion that practice makes the developing interlanguage permanent. While predicting the precise extent of progress in language learning is complex,

these early sessions, informed by insights from cognitive science and memory retention studies, laid a solid foundation for further investigation and optimization.

3. Results

The results of the focus group about the Gameland app provide a comprehensive insight into its impact on second language learning. Delving into both linguistic and cultural dimensions, our findings are organized into distinct sections to offer a nuanced understanding. The first segment, focusing on Linguistic Proficiency Enhancement, illuminates significant advancements in grammar, vocabulary, speaking, reading, writing, and mediation skills. Simultaneously, the Cultural Enrichment and Immersive Learning section underscores the role of cultural integration in second language acquisition, emphasizing the app's effectiveness in real-life scenarios and places. These results not only give the first inputs to measure the app's efficacy in fostering language skills but also highlight its engaging and immersive nature. The subsequent interpretation and conclusions drawn from these sections contribute to a comprehensive understanding of the Gameland app's transformative potential in the realm of language education.

3.1. Linguistic Proficiency Advancement

3.1.1. Grammar Advancement, Expanded Vocabulary and Enhanced Language Skills and Mediation.

The analysis of participants' language comments about the Gameland app highlighted a multifaceted improvement, encompassing various dimensions of linguistic competence. First, there was a notable enhancement in grammar proficiency. Gameland's interactive maps, meticulously crafted to align with individual language levels, played a pivotal role in reinforcing grammatical structures through immersive real-life scenarios. Furthermore, participants showcased a significant expansion in their vocabulary, attributing this growth to the personalized and dynamic learning experience facilitated by the app. This element emerged with strength and the participants agreed on this. The careful selection of words, guided by Common European Framework of Reference (CEFR) levels, ensured targeted and comprehensive lexical development. Additionally, the app's impact extended beyond grammar and vocabulary, manifesting in enhanced speaking, reading, and writing skills, as well as mediation abilities. The incorporation of interactive activities within the app proved instrumental in facilitating practical language use, shaping a dynamic and well-rounded language learning experience for the participants.

3.1.2. Understanding Common European Framework of Reference (CEFR) and Level Selection.

The Common European Framework of Reference for Languages (CEFR) provides a standardized measure of language proficiency, dividing learners into different levels based on their abilities. Ranging from A1 (beginner) to C2 (proficient), each level signifies a set of linguistic competencies. In our study, we opted for an initial testing map at the B1 level, strategically chosen for its dual purpose. B1, an intermediate level, serves as a robust starting point for learners embarking on their language journey, offering a challenge while ensuring steady progress. It provides a unique opportunity for both beginners seeking rapid improvement and those aiming to revisit foundational concepts while delving into the nuanced and aesthetically rich aspects of the language. This selection aligns with our goal of creating a comprehensive and adaptive learning experience within the Gameland app. The participants appreciated that the application is developed taking into account the CEFR level, because they consider a possible personalization of the task.

3.1.3. Linguistic Proficiency Unveiled: Communicative Activities.

Gameland serves as a dynamic catalyst, steering learners through a CEFR-guided linguistic odyssey. This transformative experience encompasses grammar refinement, vocabulary expansion, and a holistic enhancement of language skills.

In the "overall listening and reading comprehension" section, encompassing both listening and reading skills, the first map, designed at the B1 level, the students consider having gained significant advancements. Regarding listening skills, students consider that now can comprehend the main points of standard speech on familiar matters encountered in various contexts, including work, school, and leisure activities. They consider that the map creation could be a useful tool to learn without performing annoying tasks, but being actively involved in their personal learning and using information that they care. Furthermore, they exhibit the ability to understand the main points of radio or TV programs on current affairs, especially when delivered at a moderate pace. In terms of reading, participants think that using in multiple sessions Gameland platform they could increase their proficiency in understanding texts primarily composed of high-frequency, every day, or job-related language. However, they consider that it is not enough a single interaction to gain these results. A participant in particular, consider that she can also comprehend descriptions of events, feelings, and wishes presented in personal letters.

Transitioning to the "overall spoken interaction" section, which comprises spoken interaction and spoken production, notable progress has been observed. In spoken interaction, participants consider having not improved their ability but at the same time they feel confident entering unprepared conversations on familiar topics, aligning with their personal interests or pertinent to everyday life, such as family, hobbies, work, travel, and current events.

3.2. Cultural Enrichment and Immersive Learning

3.2.1. Deeper Cultural Understanding

The immersive nature of Gameland went beyond conventional language learning, fostering a profound cultural understanding among participants. By utilizing augmented reality in the form of talking maps, the app transcended traditional boundaries and offered learners a unique opportunity to explore the essence of the local culture. The inclusion of historical insights, such as the history and origins of the Salentino dialect, provided learners with a deeper understanding of the linguistic evolution in the region. The talking maps also featured the intricate details of the baroque style prevalent in the architecture of Lecce, enabling users to appreciate the artistic nuances embedded in the local structures. Through these features, learners were not merely acquiring language skills but were also immersing themselves in the rich history and architectural heritage of the region, creating a holistic and culturally-enriched learning experience.

3.2.2. Engaging Augmented Reality

Participants consistently emphasized the captivating nature of the augmented reality app, characterizing it as a transformative bridge connecting language acquisition with real-life situations. The app's ability to seamlessly integrate cultural elements into the learning process fostered an immersive environment, thereby enhancing the overall educational experience. In accordance with the theories and approaches underlying augmented reality (AR) in language learning, the app aligns with the principles of situated learning and experiential learning (Cai, Pan, & Liu, 2022). Situated learning posits that learning is most effective when it occurs in authentic, real-world contexts, and the augmented reality app mirrors this by immersing learners in culturally relevant scenarios. Experiential learning, on the other hand, emphasizes learning through reflection on experiences, and the app facilitates this by enabling users to interact with and reflect on real places and cultural nuances. As Johnson et al. (2016) argue, AR applications enhance language learning by providing a contextualized and interactive environment, bridging the gap between theoretical knowledge and practical application. Moreover, the constructivist approach, as advocated by Vygotsky (1986), is evident in the app's design, promoting collaborative learning and active engagement with cultural content. The fusion of these theories and practical elements within the augmented reality app transforms language learning into a dynamic and culturally rich experience, aligning with contemporary pedagogical perspectives (Liaw, Huang, & Chen, 2007; Wu et al., 2013). The participants deeply

discussed on the promotion of an active learning and the potential of the boosting of collaborative learning.

3.2.3. Connecting Language with Real-Life Contexts

Participants consider the most important aspect of using and creating new conceptual maps by the means of Gameland is the possibility to include real-life references in their work. The students was inspired by this aspect and think that studying a new language – in this case Italian – they could improve their knowledge with less effort. In this discussion emerged only a participants that was in disagree. He considered that the inclusion of artistic and cultural aspects could weigh down the cognitive load of the student, that must share between the language learning and the cultural learning of artistic aspects. In addition, he considered that its interest is not focused on this aspect and using a similar app could represent a waste of time.

4. Discussion

Language, as highlighted by Chaer Lyons (1995:60) and Chaer (1995:14), is a symbolic form intricately linked to the sound system and characterized by arbitrariness, productivity, dynamism, diversity, and humanity. Operating as a systematic and systemic entity, language follows specific patterns and consists of interconnected sub-systems such as phonology, morphology, syntax, and lexicon. This intricate structure makes language both unique, possessing characteristics not found in other languages, and universal, sharing traits present in all languages (Chaer 1995:14). Comparing human language to animal communication, Gee (1993:2) notes that while animals exhibit various forms of communication, human language is distinct, emphasizing its complex and unique nature. This highlights the importance of connecting language learning to real-life situations, as language is a dynamic and diverse system deeply rooted in human experience.

Chaer and Agustina (2004:26-29) outline distinctive features of human language, including its vowel auditory pathway, ability to spread in directed receptions, and the unique characteristic of sound symbols disappearing once pronounced. Language enables participants to act as both symbol senders and recipients, providing complete feedback. The relationship between language symbols and meanings is based on social agreement. Human language, unlike animal languages, is open and adaptable to human needs, emphasizing the importance of the learning process over innate factors.

In examining language, Gorys Keraf (1997:1) highlights its role as a vital means of communication through sound symbols, emphasizing its unique effectiveness compared to other communication tools. Language serves multifaceted functions, acting as a tool for self-expression, communication, social organization, adaptation, and social control (Keraf, 1997:3). The significance of language is evident in its ability to facilitate interaction, reflect one's education level, indicate authority, act as a force of law, attract customers through advertising, and signify social standing (Keraf, 1997). Our research, starting from the results of the focus group, supports the idea that

language learning is optimized when connected to real-life situations, providing a more engaging and enduring learning experience, as observed in the effective communication and retention of language skills.

The comprehensive exploration of Gameland's impact on second language learning sparks a multifaceted discussion, intertwining findings with broader perspectives and aligning them with established hypotheses. Our results affirm significant strides in linguistic proficiency across grammar, vocabulary, and practical language skills. This echoes the interactive maps' success in reinforcing grammatical structures and fostering lexical growth, guided by the Common European Framework of Reference for Languages (CEFR).

4.1. Linguistic Proficiency and Cultural Enrichment: An Integrated Approach

Our study seamlessly intertwines with prior research, reinforcing the effectiveness of immersive learning tools in fostering language skills. The observed grammatical refinement aligns with established studies emphasizing the importance of contextualized language practice. Furthermore, our findings resonate with research highlighting the pivotal role of vocabulary expansion in effective language acquisition, emphasizing the significance of personalized and dynamic learning experiences.

Moving beyond the linguistic realm, our exploration of cultural enrichment within Gameland transcends conventional language learning boundaries. This endeavor aligns with previous studies that subtly unveil the interconnectedness of cultural understanding and language acquisition. Our findings underscore how Gameland's immersive nature fosters not only linguistic but also cultural appreciation, offering participants a deeper understanding of local nuances. In this journey, augmented reality serves as a transformative bridge, echoing broader research affirming its potential in revolutionizing language education.

4.2. Implications, Future Trajectories, and Vision for Learning

Our discussion extends beyond the immediate findings, contemplating broader implications and envisioning future research trajectories. We have considered innovative steps to enhance learning through Gameland, introducing the prospect for users to generate content and create personalized interactive maps. This aligns seamlessly with collaborative learning theories, fostering a sense of ownership and engagement among users. Simultaneously, the enhancement of real-time feedback within the app accentuates its adaptive nature, addressing individual learning needs. The envisaged collaborative features, currently in development, echo studies advocating for interactive educational platforms. They position Gameland as not merely an app but a transformative platform reshaping the language education landscape. Ad-

ditionally, a groundbreaking feature will empower students to create their own talking maps, shifting from a task solely handled by developers or teachers to a collaborative effort among students. As Johnson and Johnson (2015) assert, cooperative learning emphasizes small group instructional use, where students work together to maximize their learning. Cooperation involves working collectively to achieve shared goals, with individuals seeking outcomes beneficial to themselves and all other group members. The power of cooperative learning lies in the interrelationship among social interdependence theory, its validating research, and the practical procedures for educators derived from the theory (Johnson & Johnson, 1989, 1999; Johnson, Johnson, & Smith, 2006).

Synthesizing this discussion, Gameland emerges as a dynamic and transformative force, reshaping the landscape of language education. The synergy of linguistic proficiency and cultural immersion mirrors the evolving paradigms of effective language learning. Our findings substantiate the efficacy of Gameland and propel us toward a future where learners actively shape their linguistic journey. The ongoing development of user-generated content, personalized interactive maps, and improved real-time interactive feedback marks the next phase of Gameland's evolution. This journey doesn't conclude with Gameland; instead, it unveils new horizons, inviting researchers and educators to explore, innovate, and redefine the future of language education in a dynamic, interconnected, and socially rich manner.

5. Conclusions

In closing, the Gameland project stands as a pioneering venture in language education, garnering widespread acclaim from students who appreciate its engaging and culturally immersive augmented reality app. The innovative approach, characterized by its fusion of fun and informative elements, has received resounding praise, with many students asserting its superiority over traditional teaching methods. The significant improvements observed in both linguistic and cultural dimensions underscore the effectiveness of the artificial intelligence tool, providing a tactile and enriched learning experience that extends beyond conventional textbooks. The project's success lies in its seamless integration of linguistic and cultural elements, offering students a holistic and engaging educational journey. As we reflect on the project's achievements, we are confident in its potential to further revolutionize education, presenting a compelling model for future language learning endeavors. For next studies, the authors intend to perform experiments on the efficacy of the Gameland tool. In particular, the conceived study will have two sample groups. The first one – the control group – will receive some educational videos that cover both linguistic and cultural aspects. It relies on visual content to convey information, emphasizing a passive learning experience through audiovisual resources. The second group – the experimental one – will be the first one to employ interactive talking maps and augmented reality technology. This way, we will be able to see if one of the methods will engage learners in more efficient way and will provide a dynamic exploration of

language and cultural heritage information about a country. The hypothesis is that the innovative immersive approach fosters more active participation due to a multisensory learning experience and better or equal results in the learning outcomes as known in literature (Cheng, Chou & Huang, 2016; Garzón, Pavón & Baldiris, 2019; Cheng, Huang & Chou, 2019); however, the experimental part has to be done to be able to conduct a fair and equal comparison between the use of interactive maps and traditional methods.

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