# Teacher perceptions on Augmented Reality Escape Classroom Games for English Language Learning

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## Abstract

Any technology-enhanced innovation has to take into serious consideration teachers' views and attitudes. There seems to be limited information on the teachers' acceptance of Augmented Reality Escape Classroom Games and their potential pedagogical value. For this reason, the present study examines the perspectives of ten in-service English language teachers on the use of an Augmented Reality Escape Classroom Game for teaching English as a Foreign Language. The study uses qualitative research methods i.e. questionnaires and interviews as the main data collection instrument. Results indicate that the breakout game can be a valuable pedagogical tool for effective language learning. Teachers further reported their willingness to include escape rooms in their future practices provided they receive adequate training and compatible mobile devices. In this vein, more systematic programs for professional growth are proposed to stimulate the design and implementation of further teacher-led innovations.

**Key words:** augmented reality, escape classroom games, EFL, teachers' perceptions

## Introduction

Over the years, games have played an important part in the development of individuals' social, emotional, cognitive, and physical well-being. For children, playing games is a natural process to explore the world while participating in enjoyable activities, interacting with others, and acquiring valuable experiences in a safe environment. However, Gen Z students find it difficult to preserve their interest and motivation through traditional games or teaching methods and there is a need to include educational innovations that will attract learners' attention and will therefore have a stronger impact on their learning experience (Bennett et al.,2008; Black, 2010). Based on the popular and recreational escape games, educational Escape Classroom Games (ECGs) are a recent innovation that promotes collaboration and critical thinking, which when combined with the affordances of Augmented Reality (AR), can become even more immersive and interactive.

Building on existing research that explores Augmented Reality Escape Classroom Games (ARECGs) in a variety of subjects ranging from chemistry (Elford et al., 2022; Estudante & Dietrich, 2020; Ferreiro-González, 2019; Roy et al., 2023), astronomy (Vicari, 2020), cultural heritage (Tzima et al., 2020; Mikkelsen et al., 2013), science (Malliarakis et al., 2021), computer science (Dimova et al., 2020) to the introduction to libraries (Johnson & Westbrooks, 2021) there was designed and developed an ARECG called "LockED in ShakespeARe's Globe Theatre" (Voreopoulou, 2024) that aspires to address gaps regarding the impact and application of ARECGs in English teaching as a Foreign Language (EFL). Its innovation

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focuses on the fact it provides an engaging storyline that integrates activities like reading, listening, writing and deciphering messages within its narrative. This creates an authentic context for language use, fostering a more meaningful learning experience (Mystakidis & Lympourids, 2024a). Furthermore, the game prioritizes a learner-centered approach through collaborative play and post-game reflection activities, promoting deeper immersion in the language and cultural awareness (Fragkaki et al, 2020).

However, any innovative educational application and approach ought to take into account teachers' perspectives toward it (Mystakidis & Christopoulos, 2022). Teachers are often the first to either embrace teaching innovations in their classrooms or to have ambivalent feelings about them and, ultimately, resist employing them in their teaching practices (Wilson et al., 2016). Educators' willingness to use any cutting - edge technology or novel pedagogical methods and media cannot be taken for granted. In a study by Mundi et al. (2012), it was reported that more than half of the teachers, who had computers in their classroom opted to use them for administrative and not for educational purposes. Also, it has been observed that the use of technology is largely influenced by the pedagogical approaches employed by the teacher (Smeets, 2005). Similarly, Niederhauser and Stoddart (2001) have reported that teachers, who follow a more behaviourist approach, tend to use technology as a means to practice skills, memorize words or to give reward, whereas educators, who follow a more constructivist and inquiry-based way of teaching, apply technology in a more open-ended way in their teaching practices. In fact, there have been identified four main types of perceptions towards major pedagogical changes in teaching by Antunes et al. (2021). These included i) active innovation, with a belief that any change is positive and applicable to the teachers' practices, ii) passive innovation, which positively addresses change but fails to implement it, iii) skepticism and finally iv) resistance. These perceptions are largely influenced by the medium's adaptability, usefulness and ease of use as long as there is sufficient support through professional development programmes (Fragkaki et al., 2022; Jamrus & Razali, 2021; Jang et al., 2021; Wei et al., 2021; Romano et al., 2023). In this respect, this study expands on previous exploratory work (Voreopoulou et al., 2024) and is aimed at addressing the following research questions:

RQ1. What are in-service English language teachers' perspectives on the use of ARECGs and their pedagogical value?

RQ2. What are in-service English language teachers' intentions towards adopting and integrating ARECGs into their teaching practice?

## Materials and Methods

### *Design of the AR Escape Classroom Game*

The ARECG "LockED in ShakespeARe's Globe Theatre" strives to promote effective language learning while also improving current curricula, providing additional language practice to A2 CEFR level English language learners, increasing their cultural awareness, and incorporating augmented reality and game-based learning into the context of EFL. By using the EscapED Framework (Clarke et al., 2017), the game follows a smooth design and development process that is applicable to instructional design. ARTutor4 was chosen over other possibilities to develop this educational intervention as it has a strong reputation among educators and it has previously supported educational initiatives in English language teaching (ELT) (Lazou & Tsinakos, 2023). Also, ARTutor4 is extremely simple to use and does not demand considerable IT skills from instructors who do not have any programming capabilities. It simply comprises of a mobile app and a web-based AR creation tool that

enables users to interact with augmentations such as images, music, 3D models, and embedded links (Lytridis et al., 2018).

Overall, the game consists of 15 cards that are enhanced with 16 augmentations such as images, interactive videos, auditory and interactive reading augmentations, language games such as crosswords, word searches, and riddles with puzzles, as well as 3D models and links that contribute to the overall evaluation and flow of the game. A QR Code and a direct link for the game can be found in Appendix A.

### *The AR Escape Classroom Game Storyline and Learning Experience*

The game begins with the instructor welcoming students at the classroom door and giving each one of them a ticket for an imaginative tour around the Globe Theatre in London. Game participants have to communicate in English and use all of the information provided on their ticket in order to find the rest of their team members and to form groups. The game is meant to accommodate two teams of four to five players each. They gather at different classroom areas and they use their mobile devices to scan the tickets so as to access the first augmentation, which is an audio extract. They can listen to the voice of their future tour guide letting them know that Shakespeare's ghost has locked them inside the Globe Theatre, but there is extra key somewhere in the theater. The tour guide defines the game's objective, which is to discover the missing key. S/he finishes by pointing out that the answers are in the students' hands, thereby motivating them to take further action with whatever they have in their hands, which are their tickets and their mobile devices. Following that, a series of AR clues and messages will lead learners to various classroom locations in search of the next clue, finally leading them to escape. To discover the missing key and win the game, players must read and listen to different passages as shown on Figure 1 in order to take notes and decipher messages.

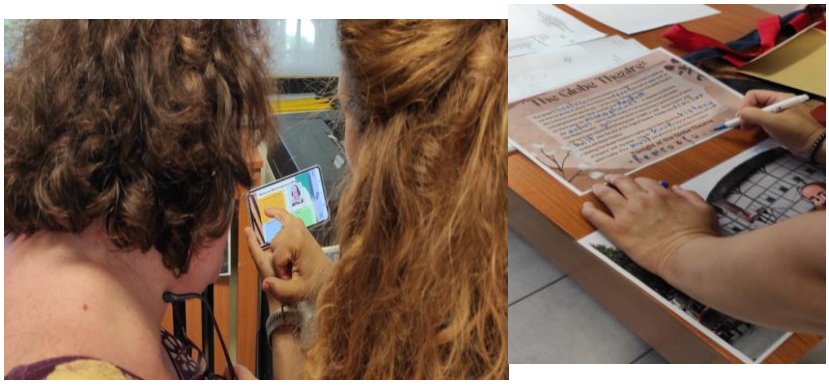


**Figure 1. Reading an interactive passage (left), Listening and taking notes (right)**

Throughout the process, the learners need to work fast, while employing critical thinking skills and to take active part in a variety of challenges, which are carefully designed to meet their diverse learning goals, styles, and skills. In other words, the puzzle activities are designed to be inclusive by encouraging learners of different levels of English language competency to contribute to the best of their abilities for the completion of the ARECG. Each

clue presents different cultural elements and aspects of Shakespeare's life and work and offers possibilities for English language practice, as shown on Figure 2.

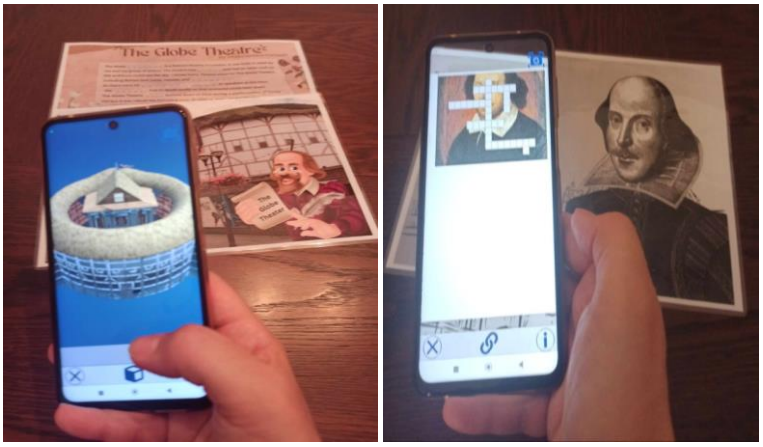


**Figure 2. A 3D model of the Globe Theatre (left), a crossword puzzle (right)**

However, the educators' part is quite different during the game, as they have to be more passive and to restrict themselves to the role of the spectator. If learners ask for help, they are not supposed to give direct answers but to help them think how to use the clues in order to reach a conclusion. On the contrary, they play a more active part in the game's preparation and organization process. The time required for the game completion is estimated to be approximately 45 minutes. Nevertheless, the reflection and follow-up sessions can take up to another one to two teaching sessions.

## *Research Design & Data Collection Methods*

The current paper aims at extending the work by Voreopoulou et al. (2024) and delves deeper into teacher perspectives on the pedagogical value of ARECGs and their intention to adopt and integrate them into their future teaching practices. The research was carried out in Thessaloniki, Greece during the summer of 2023 and the participants were selected randomly after an open invitation and their participation was on a voluntary basis. Game sessions were scheduled on different days and venues to meet teacher availability. Initially, teachers were presented to the principles of ARECGs, and then assisted with downloading ARTutor4 and familiarizing themselves with it, if necessary. After the game session, the teachers were given a questionnaire to fill in, which was developed from relevant literature including validated survey instruments (Mystakidis & Christopoulos, 2022; Lee, 2022) and enriched with some further items concerning the participants' demographics, the pedagogical value of the game they played and their future intentions in relation to whether they would introduce an ARECG into their teaching practices. The items were all in English as the participants are proficient English language speakers. The questionnaire was anonymous and it was directly distributed to the teachers, who played the game in one of the sessions organized by the first author. Upon the questionnaire completion the teachers participated in semi - structured interviews in order to further elaborate on the questionnaire answers and to expand on their ARECG experience with comments and specific examples. This kind of interview gave the opportunity to the interviewees to discuss freely and to exchange ideas, therefore offering a

wide range of replies. There were instances when one complemented the other's responses thus resulting in more reliable and trustworthy records (Watts & Ebbutt, 1987; Arksey & Knight, 1999). The first author led the interview by asking open-ended questions and fostering discourse among the participants in a friendly and relaxed setting. The interviews followed the recommendations for conducting successful interviews (Brenner, 2006; Jacob & Furgerson, 2012) and geared towards active listening without interruptions.

The data deriving from the questionnaires were processed using descriptive analysis, with a view of determining correlations between the various variables in the sample population and drawing conclusions. Additionally, the data collected from the semi-structured interviews were transcribed and subjected to thematic analysis using coding techniques, revealing major topics and patterns in their responses. The leading themes were compared and contrasted across the participants to determine parallels or variations in their viewpoints and attitudes toward the ARECG. At the end, all of the responses were compared to gain an in-depth understanding of the game's impact on teachers' experiences and attitudes in the light of the research questions.

The sample consisted of ten, in-service English language teachers serving in primary and secondary education in Thessaloniki, Greece. All of them were female, with the majority of them being considered as middle aged something that perfectly aligns with the structure of the present educational system and the fact that most of them work in the primary level of education. The majority of the participants were experienced teachers which results in them being well informed about the current curricula and the course material availability for each level.

## Results

In relation to their familiarity with AR and escape games there was a variety of responses. The majority of the participating teachers demonstrated a low level of familiarity with AR indicating potential room for growth and training in this area. Similarly, there was a diverse range of responses regarding familiarity with escape games with approximately half of them reporting low levels, whereas others were more comfortable due to prior experiences. All the participants managed to finish the game within the allotted time.

There was a 40% though that encountered some technical issues, which although they were easily resolved, they affected the game's completion time. Although, we cannot draw any conclusive correlations between the familiarity levels and the completion time mainly due to the small sample size, the overall success of the participants suggests that the ARECG is a user-friendly game despite the varying familiarity levels with AR or escape games.

In respect to teachers' perceptions on the use and pedagogical value of the ARECG, the results were very encouraging. Initially, teachers focused on the cognitive benefits of 'LockEd in ShakespeARe's Globe Theatre'. They strongly agreed by 100% that the game enhances receptive and productive skills in English and that it promotes active learning. Similarly, a 90% of teachers strongly agreed that it also promotes autonomous learning and an 80% of them strongly agreed that the game allows for memorizing content, facilitates a better analysis of the problems posed and that it also increases the learners' attention span and concentration levels. 70% of teachers responded that they strongly agree with the fact that the game enables an effective application of the material learned whereas a 20% simply agreed with the fact and a 10% had a neutral response.

The same responses were reflected in the interviews. In particular, teachers reported that the game raises cultural awareness by giving learners information about Shakespeare's life and work, thereby encouraging them to understand parts of the British cultural heritage and

its contribution to world literature. This combination of English language learning and cultural awareness enhances the learning experience and gives students a deeper knowledge of language and culture.

Teacher 7: "Learners gain cultural awareness as they learn facts about a supreme figure of British literature and his work."

What is more, they noticed that learner autonomy is promoted because students will have to take the initiative and help each other in the learning process. Their eagerness to win the game will be a catalytic factor towards this direction.

Teacher 2:"It would pave the way to learner autonomy since students feel excited when they try to discover something and search around the classroom."

The teachers also stressed that students will have the opportunity to learn the factual information provided in the game in a well-structured manner that gradually increases in difficulty and supports learners' development. The presence of scaffolding allows all students to participate and contribute to the activities, promoting an inclusive learning environment.

Teacher 3: "Good scaffolding of the activities."

Teacher 9: "There are activities for all students to contribute

In the same vein, the teachers strongly agreed by 100% that the key ideas in the materials were thoroughly comprehended and the activities used in the ARECG were authentic and purposeful. Teachers also found that this ARECG boosts learners' confidence in English and that it provided them with opportunities for reflection and drawing of conclusions (80% strongly agreed). Furthermore, it should be mentioned that the majority of the teachers who played the game strongly agreed that it will help students learn a lot of factual information related to Shakespeare's life, his plays and the Globe Theatre.

Their remarks suggest that the ARECG provided an optimal learning environment and an effective teaching method with activities that are well-aligned with the curriculum, addressing the topic of Shakespeare's work and life in a thorough manner, while also offering an innovative and entertaining learning approach.

Teacher 3: "I think that it perfectly fits our curriculum and the topics that our book covers"

Teachers estimated that the ARECG will also boost learners' linguistic development, vocabulary acquisition through a variety of tasks that promote the advancement of their receptive and productive language skills.

Teacher 4: "Students practice reading in an interactive way. I think it's very good for them".

Teacher 2:"They enhance their vocabulary because of all the games."

Teachers' responses in relation to their future intentions regarding the integration of ARECGs into their teaching practices were highly encouraging and they emphasized the underlying potential of such games to transform teaching and learning. The vast majority expressed a keen interest in incorporating such games into their classrooms as well as learning how to make them by themselves.

Teacher 4: "I could imagine myself implementing it in my classroom with my students".

Teacher 7: "I would use games like that and this one, of course, I think it's a very good idea to improve the text in the book and use modern technology and something that children like".

It is worth noting that all participating teachers agreed unanimously on their desire to participate in teacher training aimed at providing them with the essential skills to effectively design and implement ARECGs.

Teacher 8: "We need training but it's something that can be done. It's not something over-ambitious".

Concerns about Wi-Fi access and device availability were raised, as well as suggestions for an introductory unit in the ARECG in order to improve learner autonomy and to enable flipped classroom approaches.

Teacher 10: "I'm a bit worried as to the number of tablets or mobile phones that are available. There are not many".

Teacher 4: "Students will be more autonomous and we can use the game in a flipped classroom or Webex lessons" (Figure 3).

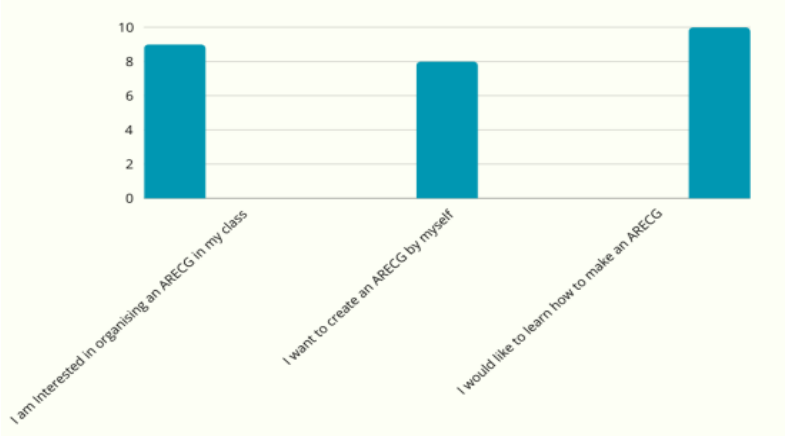


**Figure 3. Teachers' future intentions**

Overall, teachers were pleased with the game's immersive and interactive nature, emphasizing its effectiveness in increasing engagement and boosting learning.

Teacher 1: "It was brilliant. I wish I could do it every day. It's really fun. The worst thing is that it finished".

## Discussion and Conclusions

### *RQ1. Teachers' perspectives on the use of an ARECG and its pedagogical value*

'LockED in Shakespeare's Globe Theatre', provided the incentive to capture the perceptions of ten, in-service English language teachers on the use of ARECGs and their potential pedagogical value. The group of teachers, who played the game, got influenced by it and agreed that it is a valuable pedagogical tool as it provides the ideal conditions for language learning. They also pointed that it caters for vocabulary retention and foreign language skills development, which can be mainly attributed to the game's holistic and playful approach. These findings are also in alignment with previous relevant studies exploring the impact of AR with vocabulary retention and the development of foreign language skills respectively (Wang & Khambari, 2020; Chen & Chan, 2019; Pu & Zhong, 2018; Yilmaz, 2016; Liao et al., 2024; Liu et al., 2016; Lyu, 2019; Perry, 2015; Wedyan, 2022). Raising cultural awareness is another issue highlighted by the teachers, since learners are exposed to rich stimuli concerning an important figure of world's literature and other aspects of British cultural heritage. This condition enhances the findings of similar studies concerning the raising cultural awareness and the promotion cultural heritage through AR enriched escape games

(Tzima et al., 2020; Karageorgiou et al., 2022). The ARECG provides the framework within which students interact with the historical and cultural elements and they are encouraged to draw connections so as to effectively apply the new materials and solve the puzzles that will eventually lead them to their escape. This efficient and entertaining application of knowledge enhances language acquisition and prepares students for an increasingly demanding world.

Additionally, one of the key findings, which illustrates the pedagogical value of the ARECG is the opportunity for active engagement in learning. The integration of AR and the ECG elements transforms the traditional learning experience of the brick and mortar classroom. 'LockED in ShakespeARe's Globe Theatre' is weaved around an engaging storyline filled with fantasy elements that require learners' immediate actions in order to manage their escape. The game combines the imaginary context with the real one as the learners are asked to take part in real life situations, like participating in a guided tour, asking and answering for useful information related to an event, reading for specific information or listening for details and keeping notes. In a few words, this immersive adventure is closely related to the learning contents and to the school curriculum as reported by the teachers, whose claims also support the fact that learners are no longer passive recipients of information but instead they become active protagonists and take the lead in their learning process. The imaginative figure of Shakespeare's ghost is implicitly there and it is spying upon players by either giving them more clues or by making the game harder for them. Learners can see and feel the presence of Shakespeare in a variety of forms including an image, a 3D model, a talking AI avatar. As the game progresses the learners receive feedback that leads them to the next clues that require their active participation in order to be solved.

Teachers were also impressed and commented favorably on the fact that the ARECG enhances authenticity in multiple levels (Mystakidis & Lympouridis, 2024b). First of all, through AR learners can virtually visit a cultural site, the Globe Theatre and meet Shakespeare's AI avatar, which is more than willing to share his experience and knowledge with them. AR technology bridges the gap between the classroom and the real world and offers students unique opportunities to engage with the contents of the lesson in a meaningful and authentic way. Second, pupils participate in activities that are similar to those encountered in real life. For instance, learners have visited museums and cultural sites before and it is their opportunity now to practice asking and answering for information related to the experience (i.e. asking about the time and/or the location of an event, listening and reading for information about a play or a historical figure). As the game elements are designed to mirror real life scenarios a sense of purpose is created and learners can understand the underlying importance of their actions that reflect potential implications and benefits in a future real-life context. Moreover, ARECGs cater for learners' authentic needs and promote differentiated and personalized learning as there is a variety of tasks and activities that learners of different levels in English language proficiency can participate towards winning the game. They all have their chance to contribute and get challenged according to their abilities, which leads to the conclusion that catering for students' authentic needs creates a more inclusive learning environment and increases their sense of ownership over the learning experience.

Overall, 'LockED in Shakespeare's Globe Theatre' not only facilitates language acquisition but also cultivates a sense of ownership over the learning journey and bridges the gap between the classroom and real-world experiences. It most essentially, equips students with valuable skills for succeeding in an increasingly complex world.

### *RQ2. Teachers' intentions towards adopting and integrating ARECGs into their practices*

All of the teachers, who immersed themselves in the world of 'LockED in ShakespeARe's Globe Theatre', were seriously influenced by it and started envisaging how to introduce an ARECG in their lessons. This corroborates positive findings of previous investigations on teacher perceptions with augmented reality smart glasses (Kazakou & Koutromanos 2024). However, they all emphasized the importance of receiving meaningful training that will help them advance professionally before employing ARECGs into their lessons. This remark is also in accordance with findings by Marques and Pombo (2021), who have highlighted the importance of teacher training in relation to AR practices and whose study concluded that attending an organized workshop increased teachers' awareness of the educational use of AR and GBL and pinpointed the changes in their practices. In this vein, the studies by Buchner and Zumbach (2020) and of Tillman et al. (2019) have revealed that teachers need to receive thoroughly organized support and training before implementing AR in their classrooms. It is common for many teachers to be excited about the potential of adopting new technology to increase teaching opportunities. The digital storytelling aspect can be a decisive factor especially for students in primary education (Fokides, 2016; Papadopoulou et al., 2024). Nonetheless, if there is no obvious reason for implementing such activities, the value that is added to the learning experience is limited (Saltan & Arslan, 2017). Taking into consideration all the above, teacher training that will integrate both instructional and digital skills should be of high priority. Teachers need a solid understanding of approaches and learning concepts that support pedagogically sound instruction combined with the affordances of immersive technologies. It is only under this light that teaching and learning will be transformed, thus enabling learners to experience and understand the subject matter or abstract concepts that would otherwise be inaccessible or too dangerous to be hosted in a traditional classroom (Lazou & Tsinakos, 2023). Moreover, stable internet connection and compatible mobile devices are indeed at schools. Teachers stressed the necessity of having appropriate equipment before creating and providing immersive experiences. They have all pinpointed that it will be demoralizing and disappointing for them and for their students, if the whole game experience would be ruined because of unstable internet connection or because of other technical, last-minute problems.

### *Limitations and future research possibilities*

The study's limitations involve a small number of participants and a short research period. Other considerations to be taken into account involve the features of the participants' mobile devices, as well as having strong access to Wi-Fi connection. The quality of this immersive experience can be easily affected by the lack of compatible devices and a weak Wi-Fi network, which will ultimately blur the participants' views and give us misleading results.

Future research possibilities could include a greater diversity of teacher population and a thorough exploration of the impact of ARECGs on learning outcomes as well as motivation, engagement and attitudes toward language learning, which could be examined with pre- and post-game tests, along with questionnaires, observations and interviews, utilizing augmented reality acceptance models (Koutromanos & Mikropoulos, 2021).

Finally, there is need for extensive training seminars and workshops that will enable teachers to improve their digital and pedagogical skills in order to design and develop their own ARECGs. The training should not be limited to the foreign language education, but it could involve a variety of subjects ranging from literature and history to math and science.

Communities of practice either in a physical or in a virtual form could offer opportunities for collaboration and for peer feedback among educators for the development of ARECG materials. At the same time, researchers could possibly investigate and explore teachers' perceptions and attitudes in relation to the games' influence on their everyday practices.

It is high time teacher training programs are organized and prioritized so as to promote ongoing professional development among educators who wish to make a difference and evolve their teaching practices in the forthcoming years.

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## APPENDIX

### *QR Code for easy access to the ARECG*