Digital games in early childhood education: greek preschool teachers' views

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ABSTRACT
Research examining preschool teachers' views on the use of digital games in teaching and learning is quite limited. This study aims to investigate preschool teachers' views about the integration of digital games in the classroom. Views from ten Greek preschool teachers were collected with semi-structured interviews and analyzed using thematic content analysis. Teachers mention that use various digital environment such as "KidMedia", "RamKid", "Kidepedia", "TuxPaint" as digital games and use them mainly for students' assessment or just for relaxation, while fewer choose to teach through digital games. Teachers observe that children are more focused and are more productive without complaining and getting bored easily. Finally, participants report as barriers mainly the lack of equipment. Implications for in-service teacher training and educational policy are discussed.

KEYWORDS
Digital Games, Games-based Learning, Early Childhood Education, preschool teachers' views, Greece

RÉSUMÉ
Les recherches examinant le point de vue des enseignants de l'école maternelle sur l'utilisation des jeux numériques dans l'enseignement et l'apprentissage sont assez limitées. Cette étude vise à étudier le point de vue des enseignants des écoles maternelles sur l'intégration des jeux numériques en classe. Les points de vue de dix enseignants d'écoles maternelles grecques ont été recueillis au moyen d'entretiens semi-structurés et analysés à l'aide d'une analyse de contenu thématique. Les enseignants mentionnent qu'ils utilisent divers environnements numériques tels que "KidMedia", "RamKid", "Kidepedia", "TuxPaint" comme jeux numériques et qu'ils les utilisent principalement pour évaluer les élèves ou simplement pour se détendre, tandis que peu d'entre eux choisissent d'enseigner par le biais de jeux numériques. Les enseignants observent que les enfants sont plus concentrés et plus productifs, sans se plaindre ni s'ennuyer facilement. Enfin, les participants signalent comme obstacles principalement le manque d'équipement. Les implications pour la formation continue des enseignants et la politique éducative sont discutées.

MOTS-CLÉS
Jeux numériques, apprentissage par le jeu, École Maternelle, points de vue des enseignants de l'école maternelle, Grèce

INTRODUCTION

Nowadays, game-based learning (GBL) is considered to be a teaching method of major importance since it enhances learning in the classroom engaging and motivating students in the learning process (Voulgari & Lavidas, 2020; Voulgari et al., 2020). Concerning early childhood education, the implementation of ICT (Information & Communication Technology) in association with the component of play, which is crucial for this age, has benefitted children's learning and growth (Manesis, 2020). The role of the preschool teachers is particularly important, as they, ultimately, decide whether and how they will integrate digital games in teaching (Voulgari & Lavidas, 2020).

Research examining preschool teachers' views on the use of digital games in teaching and learning is quite limited (Marklund, 2019; Nikolopoulou & Gialamas, 2015; Raptopoulou, 2015). This study investigated preschool teachers' views about the integration of digital games in the classroom.

LITERATURE REVIEW

Games-based learning in early childhood education

Many studies investigated the application of various digital games in preschool settings acknowledging the contribution of digital games in learning and investigating the improvement of preschoolers in specific content or about particular skills. Aslanabadi & Rasouli (2013) examined english vocabulary enrichment of preschoolers in Tabriz, Iran by splitting the children into two groups, using digital games from an online site (http//anglomaniacy.pl) and the traditional teaching method, assuming that digital games are more effective since children enjoy activities that include new technologies and at the same time games, which often create a pleasant atmosphere in classroom. In her study, Herodotou (2018) discussed the use of the game "Angry Birds" to teach physics in preschoolers in England, which lead to the conclusion that not only digital games improve students' performance but also, digital devices such as tablets play an important role in the learning experience.

Finally, some studies revealed the contribution of digital games in the development of problem-solving skills of preschoolers. For example, Morfoniou et al. (2020), detected the strategies that preschoolers in Greece apply to solve problems using the game "Inventioneers". The analysis of the results indicated that children engaged not only in trial-and-error strategies for problem-solving, but also in higher order cognitive processes such as reflection, inferences, hypotheses, discussions, and debates. .

Teachers' views about digital games in early childhood education

Empirical research conducted worldwide on the views of preschool teachers about digital games integration in teaching and learning is limited. Some studies show that teachers support digital games as very beneficial for children. For example, Nikolopoulou & Gialamas (2015) examined Greek preschool teachers' perceptions of digital games found that the majority considers digital games is not only a freeplay activity but should also be included in structured activities. In addition, these positive attitudes seem to be more common among teachers with less work experience and more familiarity with ICT. Similarly, Marklund (2019) investigated

early childhood educators' opinions in Sweden about digital games in the classroom and concluded that this inclusion will prepare their students for the digital world they will have to face from now on, as well as the fact that digital games benefit children's verbal and mathematical skills. Examining the preservice teachers' beliefs about GBL in USA, Kenny & McDaniel (2011) found that after implementing with the game itself, they changed their intention to add games to their future teaching practice which also leads to the conclusion that universities could help raise this intention of using GBL by adding more courses and training about the involvement of digital games in teaching.

Even though the utilization of digital games in teaching provides many benefits to preschoolers, researchers revealed that teachers face many barriers that prevent their usage. Manesis (2018) found that three main barriers are the lack of self-efficacy, the lack of support and the appropriate equipment. In her study, Palaiologou (2016) investigated teachers willingness to implement digital devices and digital games into teaching, and found that their willingness is being affected by a number of factors, such as their perception that that children's mobility skills are not supported during gameplay, and the lack of social interactions since the kids, mostly, play individually with the digital games.

Research goal & research questions

According to our literature review there are limited studies that highlight the ways of integrating digital games as well as the perceptions of preschool teachers on the benefits and barriers of the use of GBL. The aim of this study is to investigate preschool teachers' views about the integration of digital games in the classroom. The research questions are as follows:

i. What are preschool teachers' views about the use of digital games in the educational process?
ii. What are preschool teachers' views about digital games' benefits for children as well as for them, when using games in the educational process?
iii. What are the barriers that prevent preschool teachers from using digital games in the educational process?

METHODOLOGY

Research procedure & research instrument

This research was carried out in March 2021, and it followed a qualitative methodology which allows researchers to analyze facts holistically and in depth. More specifically, it is a case study in which we focused on teachers' views digital games. Semi-structured interviews with preschool teachers were carried out to identify their practices regarding GBL. The interviews were conducted individually and the interview protocol was based on the purpose of the research. The interview protocol was tested on one individual before the main survey to review the interview and make corrections. Table 1 presents the final interview questions (Bryman, 2016).

The interviews consisted of two parts and of 8 questions in total. The first part was about the preschool teachers' use of digital games, the positive impact on both preschoolers and teachers and the barriers for their integration in the educational process. The second part was about the demographic profile of every participant, including their teaching experience.

Participants

The purposive sample consisted of ten Greek female preschool teachers from the Western Greece Region. The interviewees were chosen with the criterion of using digital games in

teaching. One of the teachers teaches in a private school and the rest are in public kindergartens. Their teaching experience varied from 10 to 20 years.

TABLE 1
Interview protocol

Do you use the method of play as a means of teaching in kindergarten? • In what way? • In what frequency?
Do you implement ICTs in your teaching in kindergarten? If yes, how often?
Which digital games do you use for the teaching-learning process? How and with what frequency do you use them? • In what school subject/learning areas do you use them?
Have you noticed any benefits on the students from the use of the digital games? • Do you believe that you, as well, have any benefits from the use of digital games? If yes, what are these?
Do you think that there are obstacles that prevent teachers from using digital games in early childhood education?
In your opinion, are digital games more efficient than the traditional teaching methods?
How many years of work experience do you have in early childhood education?
Have you received any training on implementing ICTs in teaching and learning process in kindergarten? • Have you referred to digital games in any of the training courses you have attended?

RESULTS

Qualitative data were analyzed using thematic content analysis (Bryman, 2016) to develop relevant codes, categories, and topics. All interviews were recorded and transcribed verbatim. The analysis of the results revealed themes such as: the use of digital games in early childhood education, the benefits on both children and educators and the barriers exist while using them in teaching, each of which analyzing below.

The usage of digital games

All the interviewees that participated in this study were already using various digital environment as digital games in the kindergarten. Some of the digital environments mentioned are "KidMedia", "RamKid", "Kidepedia", "TuxPaint", etc. Also, the use of digital tools such as "Google Earth" and "PowerPoint" or platforms to create their own games in the subject they want, such as “e-me”, is a common opinion amongst the teachers. Regarding the use of digital games in the educational process, the most common use is the assessment of the students’ acquired knowledge and skills, and also for fun and entertainment. Specifically, one teacher stated that:

> Teacher *1: "The one alternative is children interact with digital games during the free play in the classroom. Another way that I use them, is as a starting point for other activities. The third way is the enrichment of the learning process and at last as quizzes for student assessment."*

The learning subjects teachers usually approach through digital games are mathematics, literacy as well as visual arts and natural sciences. In some cases, teachers stated that use the interdisciplinary approach to teach via digital games. Specifically, a teacher stated that:

Teacher 4: "I use digital games in all the cognitive sectors. The site 'photodentro' has many interesting games about natural sciences and also maths and vocab. In addition, I use digital games for health education, such as teaching about the emotions or traffic education."

The benefits of digital games for children and teachers

Almost all the interviewees stated that digital games are quite preferable because they engage children more, and they are enjoyable Specifically, one teacher stated that:

Teacher 7: "Children enjoy the digital games so much that ask me to send them a few in their parents' email so they can play at home. They also like digital puzzles we make via 'Jigsaw Planet'."

Many teachers observed more concentration from children and of course through this interaction with digital games they become more familiar with technology. Some other benefits mentioned are the development of fine motor skills and visual perception. One teacher stated that:

Teacher 2: "I think they had bigger concentration because they enjoy the whole thing with technology. They had a motivation to complete the activities because of the image and sound, it was more pleasant for them."

Regarding the benefits on teachers, it was mainly reported that digital games facilitate their job, help them better organize their teaching and save time. At the same time, they enrich their knowledge and practice their computer basics. Specifically, a teacher stated that:

Teacher 8: "As teachers, when we tend to create our own digital games/tools we get in touch with the digital world and don't forget what we already know while at the same time we gain new knowledge too. I consider digital games to be very important for educators since we live in a society based on technology, their use brings us and the kids closer to the reality."

Barriers to the use of digital games in early childhood education

The most common obstacles mentioned by the teachers were the technical issues. More specifically, the lack of equipment or internet connection are critical factors. Furthermore, a great number of the teaching staff is not trained enough on the use of new technologies. More specifically, teachers stated that:

Teacher 1: "I would say that the equipment is a barrier, especially in remote areas. That's what I had to deal with, so I brought with me my own laptop. I consider it a barrier because the school organization does not give equal opportunities to every child."

Teacher 10: "I believe that the teaching staff is quite old. I mean, especially in towns, there are older preschool teachers working, who haven't grown up with computers."

DISCUSSION & CONCLUSION

The aim of this study was to investigate preschool teachers' views about the integration of the digital games in the classroom. Concerning the first research question, preschool teachers stated that tend to integrate various digital environment as digital games into their teaching process on a daily basis or at least several times during the week. Most of the participants of this research mentioned that they use digital games for students' assessment or just for entertainment, while fewer choose to teach through the digital games in subjects such as vocab, mathematics or even

in other sectors of the Greek curriculum of kindergarten such as arts and natural sciences. These findings confirm other studies (Marklund, 2019; Herodotou, 2018) that stated that the sectors of language and mathematics are being developed, amongst others, through GBL.

Regarding the second research question, the benefits of digital games in preschool teachers and preschoolers, it has been observed that children are more focused when using digital games, they gain familiarity with technology and being more productive without complaining and getting bored easily. This report confirms the study of Aslanabadi and Rasouli (2013) who also indicated that the interaction with the computer impacts the learning process of the children. In addition, teachers' work is becoming easier since digital games enable them by providing a variety of educational content depending on the theme they want to approach each time.

Regarding the third research question about the barriers of integrating digital games into teaching in early childhood education, it is reported that the most common barrier is the lack of equipment and in general the existence of technical issues. At the same time, it is important to note that the teaching staff seems to be mostly untrained in the use of ICTs and consequently digital games for teaching in kindergarten. These findings confirm similar studies (Manesis 2018; Marklund 2019; Raptopoulou 2015) which stated that the lack of equipment and the lack of training of the teachers on ICTs are common obstacles on GBL integration.

Considering the benefits and the barriers that teachers see from using digital games in the classroom, it seems that technical support for the teachers would facilitate GBL implementation to a large degree. Also, the training should elaborate on the relevant pedagogical approaches and the way ICTs can be used for attaining the learning goals through appropriate activities (Lavidas et al., 2021; Theodoropoulou, Lavidas & Komis, 2021).

Finally, the main limitations of this study is that the small sample size does not allow for generalisations, and also the fact that the participants were volunteers and they discussed their personal views on ICTs is an issue as it usually leads to biased responses (Lavidas & Gialamas, 2019). Further research is required on preschool teachers' views on how they use digital games.

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