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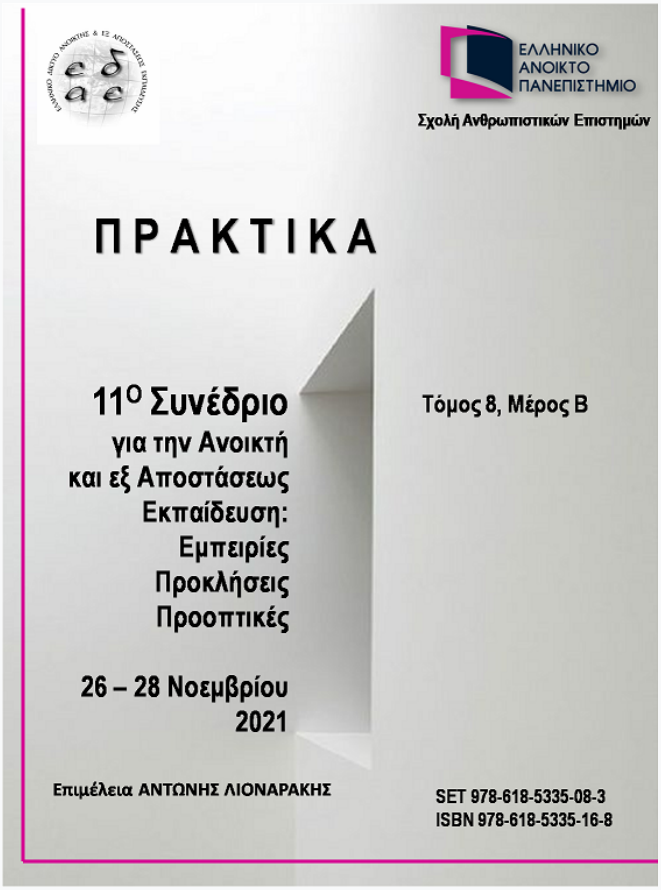

From physical to digital classroom using digital storytelling and serious games to increase children's participation: An interactive lesson plan through Padlet web tool.

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Από τη φυσική τάξη στη σύγχρονη εξ αποστάσεως εκπαίδευση χρησιμοποιώντας τα εργαλεία της ψηφιακής αφήγησης και των παιχνιδιών σοβαρού σκοπού με σκοπό την αύξηση της συμμετοχικότητας των παιδιών: Το παράδειγμα ενός ψηφιακού σχεδίου μαθήματος βασισμένο στο διαδικτυακό εργαλείο Padlet

From physical to digital classroom using digital storytelling and serious games to increase children's participation: An interactive lesson plan through Padlet web tool

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Abstract

This paper refers to the implementation of a weekly online teaching scenario that took place in the school year 2020-2021 (March 2021) at the 5th Public Kindergarten of Argostoli, based on the tools of digital storytelling, serious games, and the Web 2.0 Padlet tool. The aim of the study was to highlight good practices of distance education in preschool education meeting the needs of the pandemic. A key issue in this pursuit is the exploration of the appropriate open digital tools and paradigms for its implementation. A further concern is the dissemination of all those good practices and suggestions to the rest of the educational community, but also mainly to the end users of the projects, who are children. After the evaluation by the children of the educational tool through appropriate evaluation methodologies, eleven (11) kindergarten teachers were asked to use online questionnaires through Google forms to evaluate the scenario, before being used in the digital classroom, in order to adapt and improve them. The findings of the study showed that the changes that have taken place in the educational process due to the pandemic have brought the modern school to face new challenges that it will have to meet in order to harmonize with the requirements of the modern digital age.

Keywords: *Distance education, preschool education, digital storytelling, serious games, Padlet, lesson plan, evaluation.*

Περίληψη

Η παρούσα εισήγηση αναφέρεται στην υλοποίηση ενός εβδομαδιαίου ψηφιακού σεναρίου μαθήματος που πραγματοποιήθηκε το σχολικό έτος 2020-2021 (Μάρτιος 2021) στο 5ο Νηπιαγωγείο Αργοστολίου, βασισμένο στα εργαλεία της ψηφιακής αφήγησης, στα παιχνίδια σοβαρού σκοπού (serious games) αλλά και στο Web 2.0 εργαλείο Padlet. Βασική επιδίωξη της μελέτης ήταν αφενός η ανάδειξη καλών πρακτικών εξ αποστάσεως εκπαίδευσης στην προσχολική εκπαίδευση ανταποκρινόμενες στις ανάγκες της πανδημίας και αφετέρου η αξιοποίηση κατάλληλων ανοικτών ψηφιακών εργαλείων για την υλοποίηση αυτής. Παράλληλα, σκοπός και κίνητρο της συγκεκριμένης εργασίας ήταν η αναγκαιότητα διάχυσης όλων εκείνων των καλών πρακτικών και προτάσεων προς την υπόλοιπη εκπαιδευτική κοινότητα αλλά και κυρίως προς τους τελικούς αποδέκτες που είναι τα παιδιά. Αφού

πραγματοποιήθηκε η αξιολόγηση του εκπαιδευτικού εργαλείου μέσω κατάλληλων μεθοδολογιών αξιολόγησης από τα παιδιά, έντεκα (11) νηπιαγωγοί κλήθηκαν σε δεύτερο στάδιο με τη χρήση ερωτηματολογίων μέσω Google Forms να αξιολογήσουν τα εργαλεία προτού χρησιμοποιηθούν στην ψηφιακή τάξη, με σκοπό την προσαρμογή και βελτίωσή τους. Τα πορίσματα της μελέτης έδειξαν ότι οι αλλαγές που έχουν επέλθει στην εκπαιδευτική διαδικασία λόγω πανδημίας έχουν φέρει αντιμέτωπο το σύγχρονο σχολείο με νέες προκλήσεις στις οποίες θα πρέπει να ανταποκριθεί, προκειμένου να εναρμονιστεί με τις απαιτήσεις της σύγχρονης ψηφιακής εποχής.

Λέξεις-κλειδιά: *Εξ αποστάσεως εκπαίδευση, προσχολική εκπαίδευση, ψηφιακή αφήγηση, παιχνίδια σοβαρού σκοπού, Padlet, σχέδιο μαθήματος, αξιολόγηση.*

Introduction

In March 2020, schools in 107 countries were closed due to COVID-19, affecting 862 million children and young people worldwide (Viner et al., 2020). The pandemic created a new reality in the educational field by finding teachers trying to adapt to this unprecedented situation and resorting to new forms of teaching. They were called upon in a very short period of time to face a number of challenges, to respond to multiple roles and to design ways and forms of distance learning. In particular, in the field of pre-school education, kindergarten teachers were called upon to respond to even more difficult challenges and difficulties, taking into account the age of the students (4-6 years) and the objective inability of most preschoolers to approach the electronic forms of education. The lesson shifted from physics to e-classroom and distance education, more necessary than ever, was the only method of continuing the educational process in this situation. It is a transition to a new learning environment, key features of which are openness, exploratory learning and a good opportunity to improve the quality of educational work. But no matter how advanced technology is, almost no country has been fully prepared for the abrupt cessation of lifelong learning in its schools and the continuation of distance education. A review of the literature on Distance Education in Preschool showed that research for this age is negligible. Research that has been conducted (Anastasiadis, 2020), shows children's positive attitude towards this advanced way of learning, but also their prejudices arguing that distance education should be offered as a complement to lifelong learning (Kaplan, 2016). As Wang (2020) pointed, although those efforts can be implemented well, maybe more deeper thoughts need to be concerned because prolonged school closure and home confinement during a disease outbreak might have negative effects on children's physical and mental health. All this situation highlights the size of an "undiscovered" field in the Greek educational reality and the need for more research on the use of digital tools in distance education (Apriyanti, 2020).

Literature review

The COVID-19 crisis has forced the education system in Greece, like in many countries around the world, to shift to distance learning, including kindergartens. 'Distance education' and 'e-learning' do overlap in some cases, but are by no means identical (AFT 2000, 2001; Arnold 1999; Evans and Nation 2000; Ryan 2002; Selinger and Pearson 1999; Twigg2001). Distance learning is traditionally defined as instruction that is offered to those who are geographically distant. It can involve the delivery of learning material through various postal services to the use of learning tools available through the Internet (Guilar & Loring, 2008). Moore (1996) presented

an initial definition as learning without boundaries of time and place. Online learning, on the other hand, refers to learning that is mediated and accessed through the use of technological tools that are Web-related (Conrad, 2006; Lowenthal et al., 2009; Nichols, 2003). The closing of schools created new data and difficulties that had to be overcome in order to continue the educational activity and the general pedagogical process, and in these new data the use and development of electronic means of communication was inevitable.

Digital storytelling is one of the most influential technology tools during distance learning (Nazri et al., 2016). There have been a great number of research studies on digital storytelling demonstrating the positive impact on children (Sadik, 2008; Damavandi et al., 2018; Robin, 2008; Balaman, 2018; Rahimi & Yadollahi, 2017). Researchers have been discussing the use of digital tools on multiple counts involving literacy skills, technology engagement, etc. (Rahimi & Yadollahi, 2017; Robin, 2008). Digital storytelling is the evolution of traditional oral narration using multimedia and interactive elements (Balaman, 2018; Nguyen, 2017; Towndrow & Tereira, 2018). It provides the opportunity for students to get in touch with digital media by creating and producing their own stories in an experiential way, acquiring a positive attitude towards technology (Konstantakis, 2020). In addition, digital stories make the educational process entertaining and creative and free it from all kinds of passivity and conventionality (Sadik, 2008).

Nowadays, one can find various digital storytelling tools online and many educators utilize them in classrooms to enhance the literacy skills of learners (Towndrow & Tereira, 2018). Storybird is one of the online digital storytelling tools used by millions of teachers and students around the world, as it provides an engaging writing setting for learners. It's an extremely engaging collaborative story writing website that embodies three ideas – creating, reading, and sharing. High-quality visuals, guiding for writing and its user-friendly interface seem appealing for learners. The ease of use and the ability to share the story are the two key features that have made it known to the educational community that shows a preference for it. The user can create the stories from scratch, starting from the cover of the book where he / she will choose the title, then from the graphics library he / she will use characters, images, different backgrounds and designs. The tool allows its users to write and publish their stories. Correspondingly, it enhances collaborative learning as it enables getting feedback from teachers and experts.

Padlet platform was also mentioned as suitable for working in kindergarten. Padlet is a digital, online bulletin board, where users can easily post and publish multimedia material using drag-and-drop. A Padlet wall for the whole classroom can be a place to collect and share students' ideas on a specific topic and serve as a repository of feedback, open discussion and interactive exchange of ideas. Videos, texts, recordings with stories, paintings, constructions, covers of favorite books, hyperlinked songs, pictures can be added to the bulletin board and organized, just as it would be organized in a regular bulletin board. It looks like a sack that encloses with a drawstring. The contents of the table can be shared through social networks, exported as a file, embedded in blogs. Of course, there is the possibility of checking the privacy of the wall and the option for personal or limited viewing.

Serious games are also video games whose main purpose is education. More specifically, serious games can be used as a teaching tool (Shute et al., 2009) in distance education and are very practical, since in addition to education, they entertain and help the child to better engage in the learning process. In other words, these are games with educational purposes, supported by entertainment and fun. They are most

often a form of simulation of the real world, with various processes, presenting the feel and appearance of a game. Their goal is to activate the player's interest and immerse the player in a safe and fun learning environment (Konstantakis, 2020).
Scratch is another digital tool used to create interactive stories, games, simulations, presentations, animation and many other programs (Resnick et al., 2009). Scratch's popularity in education is due to the ease with which various programs can be created, but also to the learning objectives that are developmentally appropriate for infants (Copple & Bredekamp, 2009). Its programming environment is designed to promote, in addition to programming knowledge, learning objectives such as the cultivation of pre-mathematical skills, prediction, classification, the cultivation of cognitive skills and problem-solving skills (Flannery et al., 2013).
Kindergarten puzzles are one of the favorite games of young students. Technology now allows us to create digital puzzles with images created by students by choosing the shape and number of pieces (from 4 to 300) and then share them. An application for creating digital puzzles is available at jigsawplanet.com. With Jigsawplanet we can put together an online puzzle and use it as an educational activity in the digital scenarios we implement in distance education, enhancing students' digital skills.

Methodology

This research examines how digital media are employed in an early childhood setting during the COVID-19 period. It analyzes how the use of digital tools changes the communication between the relevant social actors, and their perceptions of their identities and of the relationships existing between them. In order to provide some answers to these questions, we adopted an explorative case study scenario. The educational scenario lasted one week and was implemented in the digital classroom of the DG Department of the 5th Public Kindergarten of Argostoli with online activities on the Cisco Webex platform but also asynchronous on the eclass platform. The number of participating students was 19 (10 boys, 10 girls) and the purpose of the script was after the completion of the program for students to know the Easter customs and events that we celebrate these days. In order to evaluate the effectiveness of the designed digital games, we asked eleven (11) kindergarten teachers with different educational experiences to fill out an online questionnaire via Google Forms and send it to us. The data for the evaluation of digital tools were collected by implementing this online questionnaire through Google Forms. The activities that were implemented were based on the tools of digital storytelling, serious games and the digital tool Web2.0, Padlet and covered all the cognitive objects provided by the cross thematic curriculum framework for compulsory education (DEPPS) for the kindergarten. The methodological approaches used were the interdisciplinary, interdisciplinary and experiential approach to knowledge, as well as the ability for collaboration and self-action.
All the above digital tools are almost new tools for the educational process if they are properly utilized in an organized learning context with educational goals, developmentally appropriate planning and evaluation.

Create a Padlet for the lesson plan

For the best organization and presentation of the lesson, a digital bulletin board was created with the digital Padlet tool, gathering all the activities of the weekly plan, divided by day and teaching hour. The Padlet was structured in columns as shown on Figure 1 and under each day of the week the activities carried out in the digital classroom and the materials used were shown in detail.

Figure 1. Padlet mainboard

In the same Padlet, the kindergarten teacher had created and posted an Easter digital library where parents could go home with the children to read Easter fairy tales and listen to songs, as shown on Figure 2.

Figure 2. Padlet digital library

Digital Storytelling - Storybird

The next activity was to create a digital story in the program Storybird. By sharing the screen, the kindergarten teacher puts the children to watch a digital fairy tale entitled “Easter in Glykomilitsa” and at the point where she talks about what is happening in the village at Easter, she stops it and asks the children to refer to their own experiences. Then they discuss how this tale is written, how the images and the heroes alternate. This tale becomes the occasion to think about our own story and create our own digital tale. Our story was entitled: "The Easter of Joy" (Figure 3) and was combined with text, images and sound. This digital storytelling activity gave children the opportunity to learn about the possibilities of the Storybird program, to develop their communication skills, to learn to construct storytelling, to practice creative writing and at the same time to increase their digital knowledge and skills.

Figure 3. Storybird "The Easter of Joy"

Serious game-drag and place

Students were asked to first think about which piece fit and then drag it by waving the mouse and join it with the rest. Each student, in addition to the digital classroom, could also play at home, either with his own puzzle or with his classmates, by clicking on the corresponding link on the Padlet. The skills developed here are space perception, logical-mathematical thinking and reaction time, as shown on Figure 4 and 5.

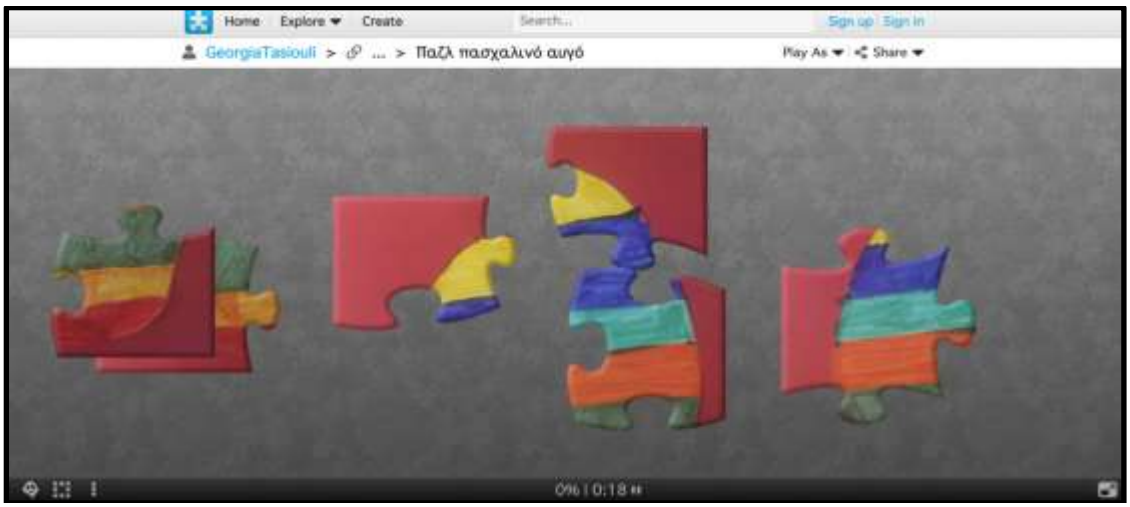

Figure 4. Serious game puzzle - Easter egg

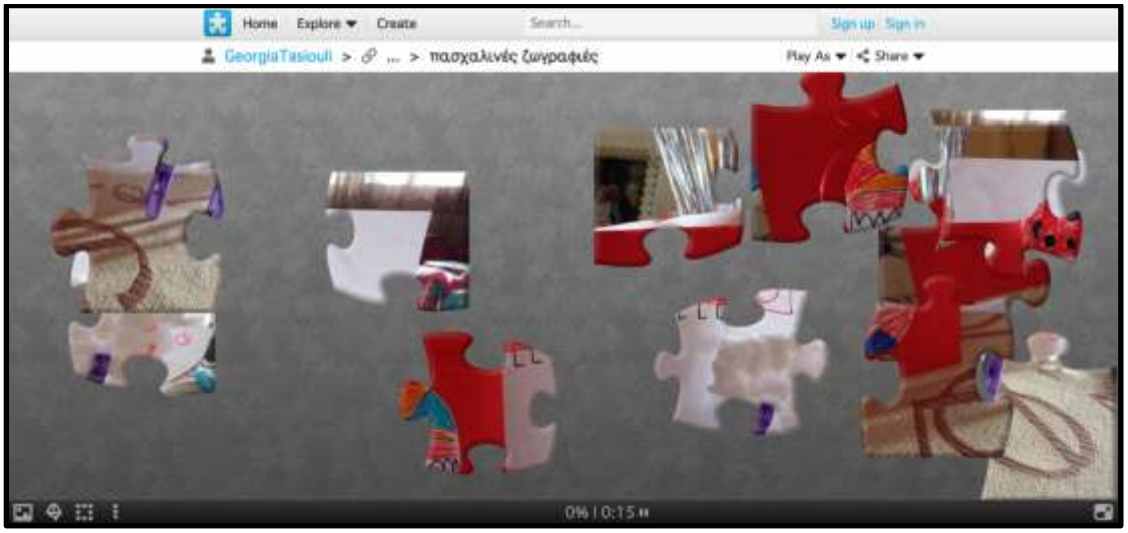

Figure 5. Another serious game puzzle - Easter drawings

Serious game- scratch

Another serious game was created on Scratch platform and is called "the Easter bunny" as shown on Figure 6 below. Here, the player is represented by a bunny holding a basket and is called with the arrow keys to do right and left in order to catch the falling eggs and put them in the basket. The game ends when the player collects thirty (30) eggs in the basket. At the end a sound is heard with an applause as a reward, and it shows the time the player did. The learning objects that are approached are the new technologies and the mathematics (development of spatial relations, perception of space, right-left orientation, numbers) in an interdisciplinary and pleasant way.

Figure 6. Scratch game “the Easter bunny”

Evaluation

In this section, we present the results from the test of the usability and effectiveness of our mini-games and evaluate the feedback received from the testing users based on

the answers to our questionnaire. Generally, the methods of evaluating the User eXperience (UX) are distinguished:

- In terms of their emphasis: on usability assessment methods and design methods.
- In terms of data evaluators collect, analyze and present: qualitative and quantitative.
- As far as the place is concerned: in the lab, in the field and online.
- In terms of User Interface (UI) time, in evaluations: expected use, appreciation, experience in interaction, and time-based experience (Konstantakis, 2018).

To overcome the challenges, our study design sought to strike a balance between different methods, including the use of observation, interviews, and questionnaires. Specifically, evaluation employed the mixed methods comprising the following:

- A general, pre-experience demographics questionnaire, administered verbally in the form of an interview for the 11 teachers.
- note-taking of the observation of children's behavior throughout their interaction with the digital tools,
- two semi-structured post-experience interviews per children/group, conducted immediately after the end of the class. The interviews were delivered in a conversational tone to draw children out on what they experienced.

After their experience, the children discussed with the teacher, who concluded the following:

- Most of the children agreed that it was a pleasant educational experience and that they learned new things about the Easter customs and events.
- In a scale of 1 to 5, the children granted the Padlet tools with 4 on how it attracts them to continue using it after 2 minutes.
- An important observation was that most children were fully absorbed by the imagery shown on the computer device and spent more time looking at the screen than observing the exhibits.
- Some children liked to be guided by the teacher, but others would have liked to break the experience and focus on an irrelevant exhibit that caught their attention.
- Regarding usability, both the observations and children's responses showed that, overall, the interface was regarded as straightforward and easy to use, even by users not experienced with touch screen devices or smartphones.

Therefore, the students through these playful activities got to know the customs and traditions of Easter as well as the events that we celebrate these days. They familiarized themselves with the mouse and the arrow keys (right and left) on the keyboard, played with puzzles, they became quite independent in trying to put the pieces together and put them together in as little time as possible. The process of taking their drawings, choosing icons, shape as well as the number of pieces that the puzzle under construction would have, was very interesting and fun for them. Furthermore, through the game with the bunny in scratch practiced on the mouse understood the meaning of space and especially the right-left orientation. They showed intense interest, but also had fun while fulfilling the educational goals.

They acquired a positive attitude towards digital media, developed communication skills, and at the same time increased their digital knowledge and skills. We believe that the way the program was developed evolved into an interesting, positive, and useful experience through which children learned experientially, created, had fun and gained new knowledge.

Furthermore, the results of the analysis of the questionnaire showed that:

- The 90.9% of our sample answered that they find the digital games attractive and interesting for children, while only 9.1% do not find them interesting (Figure 7).

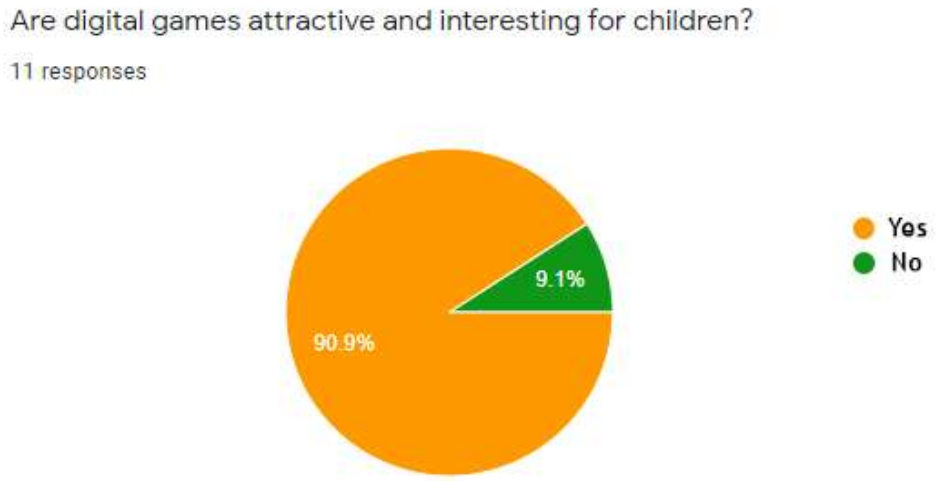

Figure 7. Google Forms - question 1

- All Kindergarten teachers seem to share the influence of technological development in the educational process, displaying their positive attitude towards this advanced way of learning. Most of the sample stated that the games are suitable for the infancy, the peculiarities, and the needs of the students.
- When asked if the children had difficulties in applying them, 54.5% of the sample told us no, while 45.5% said yes.
- On a scale of 1 to 5, 36.4% of the sample of teachers described the games with 3 as a bit difficult, a percentage of 27.3% with 4 and the remaining 36.4% of the sample with 5 that they are very easy (see Figure 8).

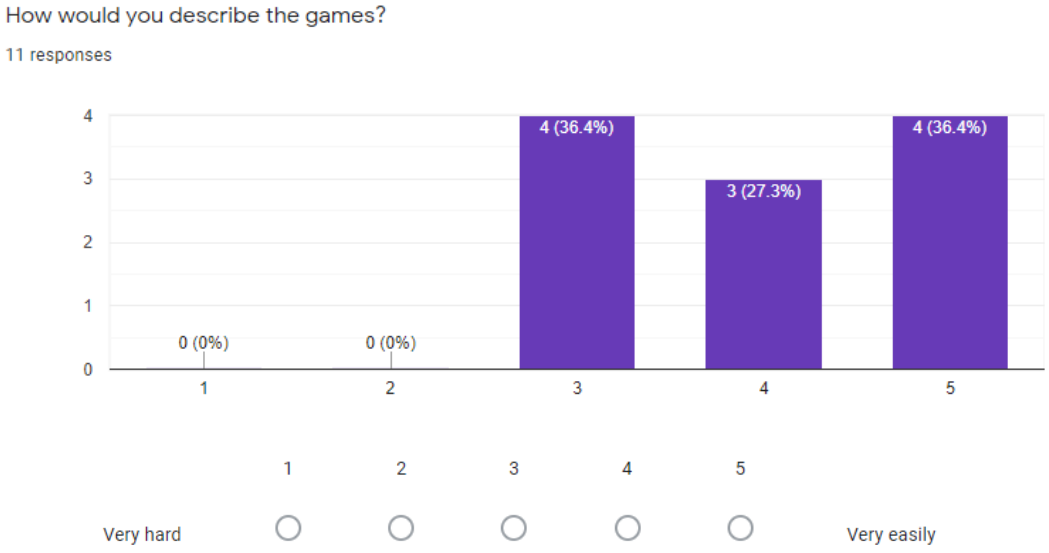

Figure 8. Google Forms - question 4

- When asked if there was anything you would change or add to the games, we were told that in the bunny game we would add voice and countdown, remarks which we included in our design.
- In our last question, if you integrated the game into your digital classroom program, 90.9% said yes, while a small percentage of 9.1% said no (see Figure 9).

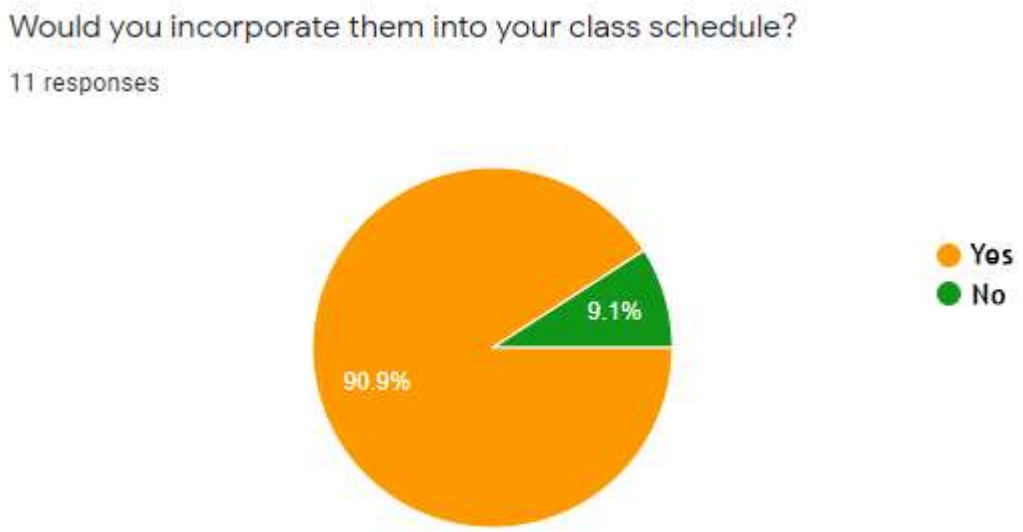

Figure 9. Google Forms - last question

Conclusion

The COVID-19 crisis has forced the education system in Greece, like in many countries around the world, to shift to distance learning, including kindergartens. The difficulties created by the closure of schools had to be overcome to continue the educational process, and in these new data the use and development of digital tools was more than obvious. In this context, digital storytelling seems to have been a dynamic approach to distance education in kindergarten and can be just as successfully applied in educational living conditions. The findings of the study posit that Storybird is an effective tool allowing learners to be creators of something unique, of which they have ownership. Storybird promoted imagination, literacy, and self-confidence. By combining entertainment with teaching, students acquired new concepts, developed attitudes and skills, through the digital stimuli given to them by games. On the other hand, the Padlet tool was a place to collect and share students' ideas and functioned as a repository of feedback, open discussion and interactive exchange of all material. Finally, the answers we received from the kindergarten teachers through the completion of the online questionnaire helped us a lot to see how the games work and if additions or changes are needed.

We hope that the suggestions and practices analyzed in this study will be a trigger for researchers to further utilize these digital tools. Also, we suggest that these tools could be a resource with which the educational community can be strengthened and used in the future to strengthen lifelong learning. Closing and considering all the new trends in the educational process, we could say that the role of Information and Communication Technologies (ICT) in education is crucial, bringing many innovations and upgrading the quality of educational work (Komis, 2004).

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