

Pupils' Perceptions on Using Toontastic 3D for Social-Emotional Learning: A Qualitative Study in an Intercultural Primary School

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Abstract

In today's complex world, Social Emotional Learning (SEL) is more critical than ever. It equips individuals with essential skills for success, impacting academic achievement, mental well-being, and navigating demanding work environments. Research suggests that digital storytelling techniques can significantly enhance the development of these crucial SEL skills. By allowing individuals to explore and express themselves through multimedia narratives, Digital Storytelling (DS) fosters self-awareness, self-management, and critical social skillsall vital components for success in today's world. This study investigated pupils' perceptions on the adoption and use of Toontastic 3D, a DS application, for developing social-emotional skills in an intercultural primary school. The research took place in the Intercultural Primary School of Eleftherio Kordelio Thessaloniki in Greece with 14 pupils of the sixth grade. Employing a qualitative approach, the research explored how pupils perceived Toontastic 3D in terms of its usefulness, user-friendliness and their attitude towards using it. The collected responses from semi-structured interviews were analyzed using thematic analysis. The findings of this analysis indicated that most pupils perceived Toontastic 3D as a valuable tool to navigate everyday situations, to raise social awareness and to facilitate emotion management skills. In addition, it was revealed that the application, despite providing guidance on the construction of narratives, offered constrained options in the settings menu and appeared to be challenging to move a considerable number of avatars simultaneously, which was deemed essential in this educational setting. Overall, the attitude towards the use of the application was positive, except for non-native speakers, who expressed negative feelings regarding the process of recording and presenting their stories.

Keywords

Social Emotional Learning, Digital Storytelling, Toontastic 3D, Intercultural Primary School

1. Introduction

In a rapidly changing world, the development of technology and continuing challenges, social emotional competencies, such as self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2024) are a crucial part of success. There is scientific evidence which indicates that the implementation of Social Emotional Learning (SEL) Programs enhances personal and social skills, attitudes, and behaviors, as well as academic performance (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Additionally, it has been shown that SEL programs mitigate problematic behaviors, emotional distress, and substance use (Durlak, Mahoney, & Boyle, 2022). Research emphasizes that successful mastery of SEL skills is associated with positive mental health outcomes and overall wellbeing (Elbertson, Brackett, & Weissberg, 2010). However, the digital age presents a compelling opportunity to enhance SEL development through Digital Storytelling (DS).

Digital storytelling allows students and teachers to create narratives using multimedia elements and represents a pedagogical approach with the potential to yield positive educational results regarding social and emotional competencies (Bratitsis, 2016; Robin, 2014; Sawyer & Willis, 2011). Stories can be used either as examples of concepts or principles taught with direct instruction, as case study problems to be solved by students, or as advisement to solve problems (Jonassen & Hernandez-Serrano, 2002). By enabling students to construct multiple versions of scenarios they might face in real life, digital storytelling empowers them to develop coping mechanisms for real-world situations. As Sawyer & Willis (2011) emphasize, this process of exploring and adapting to various narratives fosters transferable skills that can be applied beyond the digital realm.

This qualitative study aims to present a methodology for integrating digital storytelling into a social-emotional program. Secondly, the study proposes a digital storytelling framework that provides specific instructions for creating stories using the Toontastic 3D application. The study's final and main objective is to examine students' perceptions of the application in terms of its perceived usefulness, user-friendliness, and overall attitude towards its use.

2. Literature Review

2.1. Social Emotional Learning

Social emotional learning (SEL) is the process through which individuals learn to understand and manage emotions, establish positive relationships, and make responsible decisions. Research shows that SEL promotes both academic and personal success, leading to better social behavior, increased motivation, and higher academic achievement (Durlak, Domitrovich, Weissberg, & Gullotta, 2015). By integrating SEL into school curriculums, educators help students build resilience and empathy, which are crucial skills for future personal and professional challenges (CASEL, 2024).

Daniel (1998) highlighted first the importance of emotional intelligence and its impact on life success. He argued that Emotional Intelligence (EI) is more important than IQ for success in business and leadership roles. So, he introduced a Five-factor Model that outlined five EI domains: self-awareness, self-regulation, motivation, social awareness, and relationship management. Apart from that, he identified specific competencies that constitute emotional intelligence, such as self-control, empathy, and initiative. From that moment on, in educational settings, a plethora of SEL frameworks emerged, for example the Collaborative for Academic, Social and Emotional Learning Framework (CASEL, 2024) or the OECD report on social and emotional skills (OECD, 2015), exhibiting considerable variability in the relative emphasis placed on each EI domain. Nevertheless, all SEL frameworks encompass a minimum focus on the cognitive, social, emotional, and values domains (Brush et al., 2022).

There are many interventions that have been implemented within the Greek educational system. For example, the Centre for Research and Practice in Educational Psychology of the National and Kapodistrian University of Athens proposed the Multilevel Conceptual Framework of Promoting Resilience and Positive Climate in the School Community through SEL-based Interventions. Based on the aforementioned framework, many programs have been designed, implemented and evaluated by the Centre, targeting general and diverse school populations in different settings, with positive outcomes for students and teachers (Hatzichristou & Lianos, 2016).

Another example, which has been also applied in this study and has empirically demonstrated to yield beneficial outcomes for students and the community, is the Greek Forgiveness Education Program (GFEP). GFEP was developed and introduced in Greece in 2014 by Dr. Peli Galiti (Galiti, 2024). GFEP constitutes an educational approach that is based on the research studies of Dr. Robert Enright, cofounder of the International Forgiveness Institute (International Forgiveness Institute, 2024), and can be used by educators in both primary and secondary education. The program is currently in collaboration with the Kapodistrian University of Athens (Forgiveness Education, 2024). However, for approximately six years (2017-2023) the School of Philosophy and Education at Aristotle University of Thessaloniki and Professor Konstantinos Bikos sponsored the program (Aristotle University of Thessaloniki, 2024), which ultimately led to the overcoming of obstacles pertaining to the approval of the program by the Ministry of Education (Galiti, 2024).

2.2. Digital Storytelling

In today's digital world, technology has transformed almost every aspect of our

lives, including the way we learn and teach. The educational process is now deeply intertwined with digital tools and platforms that shape the way students access, process and engage with information. This shift presents unique opportunities to make learning more relevant and connected to students' real lives. One powerful technique that bridges the gap between digital reality and traditional education is digital storytelling.

DS is considered as the combination of traditional oral storytelling and multimedia-telecommunication tools (Lathem, 2005), like images, text, video, recorded narration and music in order to create a short story related to a specific subject or object (Robin & McNeil, 2012). In an educational context, DS can personalize learning experience (Towndrow & Kogut, 2020), provide more variety in teaching, make the explanation and application of certain topics more exciting, simulate real situations in a cheap and easy way and enhance the active involvement of students in the learning process (Gils, 2005). Stories can serve as discussion starters, aiding in the comprehension of even abstract concepts (Robin, 2008), simulate problem situations which have to be solved or instruct students how to solve a problem situation (Jonassen & Hernandez-Serrano, 2002). Teachers at all levels can employ digital storytelling in a range of subjects to facilitate the learning process by prompting students to organize and express their ideas and knowledge in a distinctive and meaningful manner (Robin, 2005).

It has been observed that students gain the greatest benefits when they create their own stories, either individually or as part of a group (Robin, 2008). By researching, asking, organizing ideas, expressing opinions they can improve communication (Robin, 2014) and narrative skills (Miller, 2020). When they remember their own learning process, in which they apply their own strengths, then they will develop learning strategies, which will accompany them throughout their lives (Lambert, 2013). At the same time, they can develop increased empathy toward situations experienced by others (Sawyer & Willis, 2011) and develop social and emotional intelligence (Zarifsanaiey, Mehrabi, Kashefian-Naeeini, & Mustapha, 2022).

Based on the above findings it becomes obvious that incorporating DS tools in a SEL program can be beneficial for students on multiple levels. Nevertheless, despite the advantages of digital storytelling, there are numerous techniques, devices, applications, Web 2.0 tools, and contexts in which digital storytelling can be employed. There is no evidence to suggest that one tool is inherently more effective than another in a specific educational context and for a specific goal. The decision to include digital storytelling in education may depend on several factors, including the amount of time available in the classroom, the availability of devices, internet access, the level of students' familiarity with digital tools and applications, the educational goals to be achieved with the students, and the age of the students. It is necessary to examine which approach to implementation is more suitable for which context.

2.3. Toontastic 3D

Toontastic 3D is a DS mobile application that originally was developed based on

the concept of creating a software that can be used with custom-built multi-pen interactive displays for arts and technology museums and with conventional mice. The software's objective was to provide young children with the ability to create their own cartoons and share their stories with other children around the world (Russell, 2010). Concurrently, Google LLC has made significant advancements in the development of the Android software edition. This innovative storytelling application provides children with the ability to organize their ideas, transforming them into engaging short stories, animated cartoons, or even books or scientific reports for educational contexts. It is a user-friendly tool that employs the principles of scaffolding to assist learners in producing digital stories (Pasqualottoa & Filosofi, 2023). The incorporation of three-dimensional graphics and the option for users to customize their narratives ensures that students are fully engaged in the process of self-expression (VanderBorght, 2017).

In the beginning, users can choose between three options: "Short Story", "Classic Story" and "Science Report" as illustrated in **Figure 1**.



Figure 1. Types of stories in Toontastic 3D.

The plot of all types of stories are visualized in a simply way simulating the "Story Mountain" technique (Arnilah & Meilida Astari, 2022) to help users go through the creation of their unique stories. The option "Short Story" has a simple three stage layout of a story, which consists of the Beginning, The Middle and the End. "Classic Story" offers o more complex five layout framework introducing Setup, Conflict, Challenge, Climax and Resolution and the "Science Report" scaffolds learners with Question, Hypothesis, Experiment, Results and Conclusion. **Figure 2** illustrates the scaffolding technique of a "Classic Story".

Once users have decided to begin, they can choose between nine settings or can use the option "Draw your own" to create their own unique setting for their story (**Figure 3**). Next is the choice of characters which can be customized by users, as far as the colors of skin, hair, shoes and clothes are concerned, offering the option to photograph themselves creating in this way a more personalized avatar (**Figure 3**). Storytellers can choose up to seven characters for each scene.



Figure 2. Classic story framework.



Figure 3. Settings and characters.

Users have up to 60 seconds, for every scene, to drag characters and to orally tell the story. The movements and the dialogues are recorded by the application once the record button is pressed. The background music and the adjusted volume help to create the appropriate mood for each story event, constructing in this way the story's emotive structure (Russell, 2010). If users are satisfied with recording and don't want to start over the scene, they move to the next scene. This procedure goes on with a maximum of seven scenes with max 60 seconds duration. So, the maximum duration of a story which is created by Toontastic 3D is seven minutes without calculating the titles in the beginning and in the end. A title and director can be added. To export the story, users choose the "Export" button and the mp4 file, which is created by this process, is saved in the "Gallery" and can be shared and managed via several applications, such as social media software, email and digital classes.

It is noteworthy that this application can be utilized in an offline environment, which is a significant advantage, particularly in the context of Greek public schools where internet access is largely unavailable in most classrooms via Wi-Fi. Internet access is only necessary when students are required to share and present their stories.

2.4. Technology Acceptance Model

The Technology Acceptance Model (TAM) is a framework developed by Davis

(1989) that tries to understand and predict users' acceptance of new technologies. TAM is based on the theory of reasoned action (TRA) (Fishbein & Ajzen, 1977), a psychological theory that seeks to explain behavior (King & He, 2006). The primary objective of TAM is to shed light on the processes underpinning the acceptance of technology in order to predict the behavior of users and to provide a theoretical explanation for the successful implementation of technology (Marikyan & Papagiannidis, 2023). In other words, the model suggests that people who find that a system is useful and easy to use will intend to use it and this intention will finally lead to the actual use of the system (Svendsen, Johnsen, Almås-Sørensen, & Vittersø, 2011).

Davis (1989) proposed that two key factors Perceived Usefulness (PU) and the Perceived Ease of Use (PEoU) affect users' Attitude (A) towards a system. The term Perceived Usefulness is defined by Davis as "the degree to which an individual believes that using a particular system would enhance his or her job performance" and the Perceived Ease of Use as "the degree to which a person believes that using a particular system would be free of effort". PU and PEoU capture the expectations of positive behavioral outcomes and the belief that behavior will not be labor consuming (Davis, 1989). As illustrated in Figure 4, the Attitude towards Use directly impacts on the Behavioral Intention (BI) to Use, which can be considered as user's motivation or inclination to adopt and use the technology. This intention finally leads to the Actual use of a system. In other words, TAM represents the Actual use of Technology, as the outcome predicted by Perceived Ease of Use, Perceived Usefulness and Behavioral Intention.



Figure 4. Technological acceptance model.

Although new technologies emerge, TAM continues to offer a robust framework for understanding user acceptance and guiding the development of userfriendly, innovative technologies. The aforementioned model is used to explore the perceptions of users for technological tools and applications in many fields such as health care systems (Holden & Karsh, 2010), artificial intelligence in teaching English as a foreign language (Liu & Ma, 2023), tourism (Solomovich & Abraham, 2024) and digital storytelling application tools in educational contexts (Sam & Hashim, 2022). While the objective of this study was to investigate how pupils perceive the Use of the digital storytelling application Toontastic 3D, the research team opted to employ the aforementioned framework considering that it was the most suitable in this research context.

3. Methodology

3.1. Research Participants and Setting

The study was conducted in an Intercultural Primary School situated in Eleftherio Kordelio, Thessaloniki in Greece. The municipality of Eleftherio Kordelio is situated within west Thessaloniki, and the local population is characterized by relatively low socioeconomic status and cultural heterogeneity.

The rationale behind the selection of the aforementioned primary school is twofold. Firstly, the researcher has been employed at this institution as a computer science teacher for a period of seven years, which provides a stable basis for research on primary school children, as well as trust among the school community. Secondly, the researcher conducted a social-emotional intervention in the sixth grade during the 2021-2022 academic year. This initiative served as a foundation for subsequent research projects.

The study involved 14 sixth-grade pupils. The group consisted of nine males and five females. Their cultural backgrounds were diverse: one student was of Romani origin, three were recent arrivals from Albania (having resided in Greece for less than five years), four were children of mixed marriages where one parent was Greek and had previously emigrated from Russia, and the remaining six students identified as Greek. While 17 students participated in the program, only 14 consented to participate in the concluding qualitative survey.

3.2. Research Procedures

The educational approach that was implemented was the Greek Forgiveness Education Program (Galiti, 2024). Inspired by Professor Enright's forgiveness research work, who is a professor of Educational Psychology at the University of Wisconsin-Madison and co-founder of the International Forgiveness Institute (2024), Dr. Peli Galiti developed an educational framework that is compatible with the cultural norms and values of the Greek society, as outlined in Galiti-Kyrvasili (2017). It is noteworthy to mention that the GFEP initiates discussion and brainstorming among students mainly through narratives. Thereafter, educators may select from a range of exercises and activities designed to facilitate deeper understanding. Among these activities is the creation of stories too. The program aims to reduce anger, depression, and anxiety, which are often the result of feelings of injustice and can be applied from pre-kindergarten through the 12th grade of secondary education.

Following training from Dr. Peli Galiti, the researcher implemented this socialemotional learning program for a sixth-grade class over 12 weeks (2 hours per week). The program utilizes lesson plans and activities and comprises eight distinct subjects that are structured according to the conceptual framework outlined in **Figure 5**.

First and foremost, this social emotional educational approach indicates that it is essential to acknowledge and process feelings, particularly anger, which is the most common emotion experienced in the aftermath of injustice. Secondly, it is crucial to gain an understanding of the concept of forgiveness and to distinguish it from other related concepts. Thirdly, it must be acknowledged that every individual, regardless of their status or circumstances, is of inherent worth. Fourthly, it is beneficial to direct attention to the positive aspects of those who have caused harm. The fifth step is to cultivate empathy by adopting the perspective of the other party. The sixth step is to develop greater tolerance for pain, the following step is to integrate the stages of forgiveness, and finally to cultivate generosity even towards those who have caused harm. **Figure 5** depicts the Forgiveness Education Framework as it was implemented by the researcher.



Figure 5. The Greek Forgiveness Education Framework as it was implemented by Delimpei Eleni.

In this study, students were required to construct digital stories based on the aforementioned framework on three occasions throughout the course of the program. The initial story concerned the recognition and management of emotions, the second focused on empathy, and the third encompassed generosity and the stages of forgiveness.

The intervention began with presenting an introduction of the program to pupils, discussing the overall layout and time schedule. After this, team building activities were implemented and the first narrative was read by the researcher. Discussion and brainstorm activities followed, and the creative writing technique, known as "Story Mountain", was presented. This technique for composing stories comprises five stages: beginning, problem, climax, resolution, and ending. The "Story Mountain" builds to a powerful climax or challenge that must be surmounted before the story can be resolved and concluded on the other side of the "mountain". The mountain's outline depicts the typical 'rise and fall' plot arc (Arnilah & Meilida Astari, 2022). Based on previous experience of the researcher, this framework, as a graphic organizer for creative writing, helps students to visualize the plot of their story. It is beneficial for novice writers and students who encounter difficulties in composing essays and stories. Given that many students in this school are learning Greek as a foreign or second language, and need additional support in behavioral, social and academics skills, the researcher employed this technique to foster motivation and engagement among the majority of students.

To continue with, pupils then were required to form groups of two or three and provide an alternative narrative ending to the first story previously presented, utilizing the "Story Mountain" technique. Subsequently, the teams presented their endings to their classmates, who offered feedback and suggestions for improvements. At this stage, modifications to the narrative structure could be implemented.

After that, pupils watched a quick introduction video of the digital storytelling tool Toontastic 3D and were given approximately an hour to explore the application and familiarize themselves with its features. Finally, they delved into creating their stories using the app and their written script. Once complete, the students shared their creations within the digital classroom environment before presenting them to their classmates.

As the program progressed, students became more familiar and confident with both the technique and the application, resulting in a notable reduction in the time required to create digital stories compared to the initial stages. Over time, researcher's guidance was gradually reduced and the narratives became increasingly complex. Pupils were able to construct not only a unique ending, but an entire narrative from the beginning. It is noteworthy that the digital storytelling framework, as applied in this cross-cultural context in conjunction with the socialemotional program, followed the stages outlined below:

First stage: "Hear and understand the story"

• Re-tell the story, discuss about the main characters, their emotions, their situation and background. Try to answer questions like: "*How does the protagonists feel*?", "*What could be made different*?", "*What if the main character had made another decision*?", "*Have you ever experienced a similar situation*?".

Second stage. "Write the script"

• Try to create your story using the creative writing technique "Story Mountain". Split the story in stages and try to use appropriate words. Present your story and get feedback from your classmates and teacher.

Third stage: "Create the digital story"

• Use Toontastic 3D to create your own story. Choose the five steps outline to match with your written script, choose the most appropriate setting and characters, animate, narrate and record your parts. Add music and if it is necessary, add or remove parts.

Tip! To minimize audio disruption between teams during playback, consider using headphones. This allows one team to listen to their recording without disturbing others who might be recording simultaneously. Your teacher can coordinate the recording schedule to ensure minimal audio interference. Fourth stage: "Export and share your story"

•Export your story as an MP4 file. You'll find it saved conveniently in your photo gallery. Share your creation with the class through your digital classroom platform and prepare to present it to your classmates! Afterwards, discuss your experiences: what worked well, and what could be improved for next time?

Figure 6 illustrates the digital storytelling framework proposed by the researchers, which can be applied to a Social Emotional Learning context using Toontastic 3D.



Figure 6. Digital Storytelling Framework with Toontastic 3D in SEL context.

3.3. Data Collection

At the end of the intervention the researchers conducted a qualitative study with semi-structured face-to-face interviews, which were recorded using a mobile application software. The individual interviews were conducted in a one-to-one setting within the school environment. This approach was adopted in order to create a setting in which the respondents could express themselves freely and without interference, thereby gaining a deeper insight of their opinion. This approach also facilitated the avoidance of similar responses. Because of the relation of the interviewer and the interviewees, researcher kept in mind not to guide pupils in a special direction (Opdenakker, 2006) and to maintain the procedure free of biases.

The interview consisted of nine semi-structured items, which were co-constructed with an expert in Information Technology and revised by the primary teacher of the specific class to make sure that questions would be understood by all pupils. These questions were then categorized based on the Technology Acceptance Model framework, as illustrated in **Figure 7**.



Figure 7. Research questions based on TAM.

The inquiries concerning Perceived Usefulness were devised with the intention of exploring the concepts proposed by the CASEL framework i.e self-awareness, self-regulation, motivation, social awareness, and relationship management (CA-SEL, 2024). The questions pertaining to the Perceived Ease of Use derived partly from a previous study (Alexandrakis, Chorianopoulos, & Tselios, 2020) and were selected with the intention of exploring students' perceptions of how easy or difficult it was to create stories in terms of interface issues, available application options, and the guidance provided by the tool.

Finally, the questions about the Attitude towards Use derived from the ABC model (Rosenberg & Hovland, 1960) which suggests that attitude has three elements i.e. Affect, Behavior, and Cognition. Affect denotes the individual's feelings about an attitude object. Behavior denotes the individual's intention towards an attitude object. Cognition denotes the beliefs an individual has about an attitude object (Eagly & Chaiken, 1998; Jain, 2014).

3.4. Data Analysis

The data analysis of the oral responses of the participants followed the thematic analysis proposed by Braun and Clark (2006). According to Braun and Clarke *"Thematic analysis is a method for identifying, analyzing, and reporting patterns* (*themes*) within data". Apart from that they provide an outline to guide researchers through the six phases of analysis.

In the initial phase the researchers familiarized themselves with data. At this point the transcription of the recorded interviews took place. Furthermore, a data collection spreadsheet was employed to facilitate overview of the data and a more comprehensive understanding. In the second phase, researchers began coding the data. This involved assigning labels, or codes, to identify key themes and ideas within the transcribed interviews (Saldana, 2013). In this phase researchers worked at first individually and then collaboratively comparing codes and determining labels (Maguire & Delahunt, 2017).

The third phase involved sorting the initial codes into potential themes. During the fourth phase, these themes were reviewed and refined. In the fifth phase, researchers focused on capturing the essence of each theme, identifying the specific aspects of the data each theme represented. Finally, the sixth phase culminated in the production of the research report.

The process was supported by ATLAS.ti which is a qualitative data analysis software developed by Muhr (1991). ATLAS.ti (2024) supported the researcher team by providing tools that helped the organization, the analysis and the visualization of data. The results yielded by the software were employed to refine and rethink previous phases, with the objective of enhancing the reliability of the findings.

4. Findings and Discussion

After the thematic analysis five themes emerged. More specifically, three themes derived from the first research question on the usefulness of Toontastic 3D for Social Emotional Learning, followed by one theme on the ease of use of the software and one theme was found in the third research question about pupils' attitudes in using the application.

 Table 1 illustrates the Research Questions, the Codes, the Categories and the

 Themes that were interpreted by the researchers.

RQ	Codes	Categories	Themes
1) What are pupils' perceptions on the usefulness of Toontastic 3D for social emotional learning?	-Can manage emotions easier -Can recognize my mistakes -Can put myself into other shoes -Can better work with classmates -Get better along with my family -Real life scenarios and solutions can be applied in reality -Can treat others fairly -Can coexist with others	-Easy way to apply solutions in real life -Peaceful Coexistence -Empathy -Better attitude towards others -Managing emotions -Gaining self-awareness -Personal growth -Emotional change -Forgiveness	-Valuable tool for navigating everyday situations -Effective mean to raise social- awareness -Useful
			application for facilitating emotion management skills
2) What are pupils' perceptions on the ease of use of Toontastic 3D for social emotional learning?	-Difficulties in moving a lot of avatars at the same time -Little variety in backgrounds, avatars and music -Low quality of story when user generated backgrounds are used -Easy editing of avatar -Good recording options -Time-consuming creation of stories especially when you create avatars and settings by yourself -Software guided you through process	-Low quality and time-consuming user generated features -Difficult simultaneously movement of avatars -Easy editing of avatars -Technology assisted guidance	-Relatively user-friendly tool with limited options
3) What are pupils' attitudes in using Toontastic 3D for social emotional learning?	-Happy -Shame when recording and presenting -Can be used in other contexts -Younger children can use it	-Positive feelings -Useful tool	-Positive attitude

 Table 1. Emerged Codes, categories and themes.

4.1. Valuable Tool for Navigating Everyday Situations

The initial theme that emerged from the responses to the first research question is that Toontastic 3D is a valuable tool for navigating everyday situations. The stories, which were based on real-life scenarios, enabled students to think of peaceful solutions to situations they could face in reality. Through digital story creation the imagined solutions were transformed into visual representations, which in conjunction with personalized avatars, facilitated the transition from the imaginary to the real world. The creation of the stories, as well as the viewing of their classmates' stories, provided an opportunity for them to recognize that alternative actions could be taken when confronted with challenging circumstances. Only 3 out of 14 students reported that they did not find the tool valuable for coping with everyday situations, because they believed that they didn't have any issues with this before the intervention.

Below are some interview responses of pupils (P) that indicated that Toontastic 3D would help them manage more effectively everyday situations.

"I believe it helps us all coexist peacefully." (P2, P9)

"Because we created our own stories with the app and we discussed and watched our classmates stories I could remember them even better." (P3)

"When we made the stories, I could more easily identify with the hero because we used avatars. The scenarios we created could have been real. The solutions we gave can be applied in reality." (P4)

"The stories helped me with my family." (P6)

"When we created a story, we apologized in the digital one but also in real life." (P7)

"Once my friend made fun of me and I said I won't take revenge, but I will forgive him." (P12)

"One time someone pushed me, and I ignored him." (P14)

These findings can be explained by the fact that real-world experiences offer opportunities for active engagement, knowledge construction, application of skills and deeper understanding of experiences, which can be challenging to achieve through traditional, theory-based instruction alone. Many learning theories such as the Experiential Learning Theory (Kolb, 1984), the Situated Learning Theory developed by Jean Lave and Etienne Wenger (1991) and the Case-Based Learning approach developed by Hoffer (2020), support the above outcome. The observation that only one participant referenced the potential link between the user and the avatar is consistent with the findings of Dhillon and Tinmaz (2024) who noticed the relation between user's personality and external factors on avatar utilization.

4.2. Effective Mean to Raise Social Awareness

The Toontastic 3D application was found to be an effective mean to raise social awareness among the students by cultivating empathy. Many of the students indicated that the act of creating stories with this software enabled them to adopt a perspective other than their own and to empathize with the experiences of others. Only 5 of the 14 respondents indicated that the tool had a minimal impact on their development of social consciousness, asserting that they had already acquired this ability at a high level of proficiency. However, most participants (9 out of 14) indicated that they are now better able to comprehend the perspectives and emotions

of others, demonstrating increased empathy and compassion, and a greater appreciation for diversity. This was confirmed by some of the students in the interviews that are presented below.

"I put myself in the other person's shoes more easily." (P2, P3)

"I helped my friends." (P2)

"One day I argued with my mother instead of getting angry I put myself in her shoes and apologized." (P10)

"I learned that we should talk to children from other countries that we should not say bad things to them and should not make fun of them." (P11)

"I used to put myself in the other person's place, but now I understand him/her more, the tool helped us to work well together." (P13)

These findings get along with the study of Ribeiro (2016) where it is stated that "Digital Storytelling assignment on intercultural issues is interesting and different from the types of activities students usually carry out and created an excellent opportunity to better understand other cultures and different views". Additionally, the research of Grant and Bolin (2016) verify the findings while they claim that "the use of digital storytelling enhanced the learning environment through greater student engagement around technology and diversity issues. By bridging course content and pedagogy around diversity and cultural competency, students were able to gain competency and experience the use of technology in academic/work-place settings and create awareness/discourse around social issues". As well as Bratitsis (2016) indicates that interactive digital storytelling can cultivate empathy towards children with autism spectrum disorders (ASD), which agrees with the aforementioned indications of the study.

4.3. Useful Application for Facilitating Emotion-Management Skill

The data analysis of this study revealed that pupils identified the capacity of Toontastic 3D to facilitate emotion management skills. Specifically, the pupils indicated that they were able to identify, share and understand their own emotions and recognize how these emotions affect themselves and others, which according to Gross (2015) is the first stage of emotion regulation. Furthermore, 10 out of 14 students indicated that the app helped them managing their emotions, controlling impulses and acting in a more peaceful manner.

"Now I have learned that all emotions are acceptable." (P1)

"I didn't tell anyone about my feelings because I was too ashamed to. Now I can express myself and feel better!" (P4)

"Now if someone hurt me and I feel angry, I try not to take revenge on somebody else." (P8)

"I don't get angry so easily." (P2)

"It really helped me to change my behaviour for the better!" (P12)

"I used to be ruder, I never apologized but now I apologize." (P2)

"My behaviour changed in a better way." (P10)

"Now I get angry a little harder, not so easily... I still can't choose forgiveness

but I'm working on it." (P5)

"Yes, I learned to manage my emotions better." (P12)

"It helped me with my emotions, not to get angry directly and to be able to forgive people easily." (P13)

These findings get in line with several studies which prove that digital storytelling can foster emotional intelligence (Sulistianingsih, SuJamaludin, & Sumartono, 2018), either in an educational setting (Sarıca, 2023) or as far teachers training is concerned (Qureshi, Iqbal, & Amjad, 2023). However, there is a lack of scientific evidence that focuses especially on the impact of digital storytelling on emotion management skills. It is therefore noteworthy that this study may stimulate further research in this area.

4.4. Relatively User-Friendly Tool with Limited Option

With regard to the second research question, students were invited to indicate the ease or difficulty they experienced in creating stories in relation to interface issues. Furthermore they were asked to identify the aspects they found most challenging and straightforward. In light of the assertion that technology interfaces influence student engagement (Pandita & Kiran, 2023; Ruf, Zahn, Agotai, Iten, & Opwis, 2022) it was crucial to ascertain the pupils' perceptions of the options provided by the app, specifically identifying the most and least preferred issues they encountered. Only 5 out of the 14 students indicated that they found Toontastic 3D to be easy to use from the beginning, without facing any difficulties. On the other hand, nine students reported initial difficulties, but subsequently found the options straightforward.

"The first story was a bit difficult but then because we had done it once we knew how to do it." (P3)

"I was a bit confused at first, then when you explained it, I understood." (P4)

"It wasn't easy to use... it took use three hours to create a story." (P9)

"A little hard at first but after we created many stories, I found it easy." (P10)

"At first, I couldn't find the scenes but then it was easy." (P13)

They also stated that the tool guided them through the process with arrows and that the framework included in the app reminded them of the creative writing technique that was implemented in class. Three students pointed out the re-recording feature as their favorite feature of the software.

"It had the arrows and showed you all the different types of stories" (P5)

"Although very easy, in general I was guided by the application" (P6)

"The app guided me especially because the "story mountain" we wrote the script was the same in the Application." (P7)

"The app itself guided me in the same way we wrote the script ... from one step to the next" (P4)

"The app helped us with the recording because it was easy when something went wrong, we could easily do it again" (P12)

"I liked it more when we recorded" (P3)

"I liked it when we didn't have to work frame by frame, you could just press Start, move, talk and that's it. And also, you don't have to worry if you make a mistake and it turns out wrong" (P9)

One feature that proved challenging throughout the process was the simultaneous motion of the avatars, particularly when numerous avatars were present. Additionally, the limited number of options available in the scenes was a significant issue. This was perceived as a disadvantage by the students, who felt that the quality of the narrative declined when they created their own backgrounds and avatars. They expressed a preference for a more expansive range of settings, rather than relying on their own creations and a broader variety of music. Additionally, they highlighted the absence of the option to add emotions to their characters. On the other hand, 3 out of 14 students found the editing of the avatars entertaining and useful.

"It was difficult for me because we always had to do something with the avatars, i.e. when they spoke we had to hold them so that the mouth would move." (P6)

"No, it wasn't easy to use because we had to move the avatars at the same time, we had to set them up and it wasn't easy for one to move many at the same time." (P7)

"It was difficult to move avatars when there were many." (P1)

"I didn't like the backgrounds as much because you can't easily make a story with them, and when you made your own background, it wasn't as nice as the others." (P2)

"It was difficult to draw our own backgrounds because the ones the app had didn't make sense for our stories." (P9)

"The music wasn't good, the songs didn't match." (P2)

"It was hard to choose a sound, it had a lot." (P10)

"Some avatars didn't make sense... we could not add emotions on the face of the avatar." (P9)

"We could make our own little people, with our own faces, change their clothes." (P5)

"I liked it when we could photograph ourselves at put the photo as a face on the avatar... we photographed our crocodile." (P8)

"I liked that we could draw our own characters." (P13)

These findings contradict those reported by Sam and Hashim (2022), in which students rated Toontastic 3D as user-friendly tool and highlighted its ease of use, particularly in moving around avatars and utilizing touchscreen functions. This discrepancy may be attributed to the distinct nature of the narratives that students were required to construct. Stories with social-emotional content may present a greater challenge than stories in a foreign language subject. This may be due to the need to illustrate complex social situations that involve multiple individuals. Also because of the use of real life scenarios users have to create real life settings which are limited in the application. Finally, emotions play a significant role in SEL contexts. The absence of adding emotions to the avatars constitutes a disadvantage of the software in this context.

4.5. Positive Attitude

In addressing the third research question which focused on students' attitudes towards the application, the majority of the class (11 out of 14) exhibited a favorable response to the use of the application. Happiness and overall a positive attitude during the process of creating a digital narrative with Toontastic 3D was expressed. In addition, collaboration with peers was found to lead to positive feelings, and the opportunity to use mobile devices in an educational setting was also enjoyable. Furthermore the new knowledge gained through the introduction of an application, they hadn't been aware of, led to increased engagement.

"Toontastic helped us unite as a team... we had a fun time through our cooperation." (P6)

"I was happy because we used the tablets." (P1)

"Nice because I was working with friends." (P2)

"I was glad because it was teamwork." (P6)

"I cooperated and I liked it, I felt happy." (P10)

"I felt good because I could use this app that I didn't know before." (P11)

"I was happy, and I was curious what we will do next." (P13)

It is noteworthy that the responses from pupils (3 out of 14) who were nonnative speakers of the Greek language were less positive. These participants reported experiencing difficulties and negative emotions, including shyness and embarrassment, while recording their digital stories due to their limited proficiency in Greek. Additionally, they encountered discomfort and embarrassment during the presentation stage.

"I didn't like talking, but mostly I did the recording because the others were shier than me. I felt embarrassed because I don't know how to speak Greek well." (P12)

"It was difficult for me to speak because I was embarrassed, because I don't speak Greek well and then we would show it." (P14)

"Awkward because sometimes we had to record my voice and I don't feel very good when I must, I also felt uncomfortable showing it to the whole class." (P9)

Apart from that students suggested to employ the software in other educational settings within the school curriculum and in collaboration with different age groups. More specific, they stated that Toontastic 3D, is a useful tool which can be implemented in several subjects like History and English classes. Additionally, they had already introduced the application to their class teacher and they stated that they had already created stories with their younger siblings.

"I showed the application to Mrs R. ...I think we could use it in history, too." (P10)

"I downloaded the app on my younger sisters' phone, and we played together" (P6)

"We could practice English or German with this tool. I will show it to Mrs C."

(P1)

"I look forward to use the application again" (P4)

These findings align with the overall attitude of the participants in the study conducted by Sam and Hashim (2022), although digital storytelling was implemented in a different educational context. Despite the fact that there is scientific evidence which indicates the benefits of DS for people with refugee and immigrant background (Kendrick, Early, Michalovich, & Mangat, 2022; Darvin & Norton, 2014) in this study non-Greek participants indicated negative emotions towards the application. This finding may potentially lead to the conclusion that language acquisition and educational goals affect students' attitudes toward digital story-telling.

5. Conclusion

Considering the above analysis, it can be posited that the application of Toontastic 3D can be integrated into a social-emotional curriculum in primary school. This paper proposed a framework designed to assist teachers in implementing the digital storytelling tool Toontastic 3D in a social-emotional context. To gain insight into the perceptions of students who used Toontastic 3D in this context, researchers conducted a qualitative study based on the Technology Acceptance Model (TAM).

As far as PU is concerned, the findings of this study indicated that Toontastic 3D can be a valuable tool in peaceful conflict resolution and in the navigation of everyday situations. The creation of digital stories in this context enables students to visualize solutions to real-life problems and to apply the process proposed beyond the digital realm. The use of avatars seems to facilitate the connection of students with the protagonist. This may help students to apply the steps they have outlined in fictional narratives in real-world contexts more directly. The study also revealed that students believe that this software in this specific context can cultivate empathy, a vital element of emotional intelligence. Empathy can increase social awareness which is crucial for building positive relationships reducing prejudice, and appreciating diversity.

Additionally, another finding that came to light is that digital storytelling with the specific software in SEL context can facilitate self-awareness through emotion awareness and emotion management. Students stated that the creation of digital stories with Toontastic 3D helped them to become aware of their own emotions and then to gain control of them. This resulted in the establishment of healthier relationships with family members, classmates, and friends.

As far as the PEoU is concerned, the application was generally perceived as user-friendly, although many students faced difficulties in the beginning. Scaffolding techniques and re-recording options were welcomed. As far as settings are concerned students pointed out that there were limited options offered by the application. The option of creating prototype backgrounds was welcomed by users, but it had the unintended consequence of reducing the quality of their stories. Additionally, the process of moving multiple avatars simultaneously proved to be challenging and the fact that students could not add emotions to the avatars was a disadvantage too.

Finally, the study revealed that most students expressed a positive attitude toward the Use of the application. With the exception of non-native speakers, who reported feelings of embarrassment and shyness when speaking in Greek, which was not their native language, the participants expressed feelings of joy and happiness while using the software. This indicates the potential for a correlation between the level of language acquisition, digital storytelling and educational subjects.

6. Limitations and Future Research

This study employs a qualitative approach to gain initial insights into pupils' perceptions of using Toontastic in conjunction with a social-emotional program. The study's limitations include its small sample size, the ethical considerations pertaining to the sample and the social context in which the study was conducted.

It would be beneficial to expand the sample size, to include participants from different age groups and cultural backgrounds. Furthermore, the role of language acquisition, digital storytelling techniques and educational contexts should be examined. Also, a comparative analysis of two or more digital storytelling or SEL methodologies would be a valuable contribution to the research literature in this scientific field. A study conducted exclusively with Greek pupils in an alternative social context may yield different conclusions.

Therefore, results must be interpreted with caution and cannot be generalized. Nevertheless, they may serve to initiate problematic and further discussion in this scientific field.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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