

INTERACTIVE STORYTELLING ON ENVIRONMENTAL ISSUES

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Abstract

Digital storytelling is a path towards acquiring various skills and literacies, as its narrator engages in many experiential activities and tasks in order to achieve his/her goals. This paper highlights a digital application designed by 3rd grade students attending a pilot experimental primary school in Greece. Specifically, the students worked on a project; they created a digital application, an interactive fairytale, available on touch devices (Smartphones, Tablets etc.). The interactive fairytale is about recycling and it is the end-product of the students' project. As it includes text, pictures and sound recorded by students, it is a multimodal text aiming towards promoting recycling.

Keywords: Interaction, Storytelling, Touch screen, E-book, project, Environment.

1. INTRODUCTION

Digital storytelling is a process which employs and combines multiple digital means in order to develop and enhance written and verbal linguistic skills. During this process, relationships and storytelling experiences are constantly being redefined in a virtual environment locus, where the user is called upon to face a wide range of socio-cognitive and technical challenges. According to Barbas και Correia (2009: 35-41), the creator of the narration often facilitates narrative expression and directs the narrative plot. Respectively, the recipient of the narration is transformed from a passive viewer to a conversational mediator and, at times, to a co-author of the narrative end-product, regardless of the level of his/her narrative abilities and skills (Aylett & Louchart, 2003: 2-9). Thus, turn up new ways in which students' and educators' roles are being revealed along with a new dynamic acquired by all stakeholders during the learning process.

Nowadays, it is widely acknowledged that digital narration provides an authentic learning environment, in which all recipients and narrators have the opportunity to develop their personal and narrative speech, represent their knowledge, narrate their story and receive feedback. Students become narrators and recipients, as they work together in collaborative environments and adopt multiple roles, in order to approach a narrative text not only critically but also from multiple perspectives (Kouklatzidou & Gkountouma, 2014). Therefore, digital narration supports critical thinking among students, develops and enhances written and verbal linguistic skills and promotes digital literacy.

When digital narration combines with hypertext literature, the students are given the opportunity to create their own stories, defying linear narration progression. According to Giannikopoulou (2004), contemporary children's books readers are able to have an interactive reading by making use of hypertext and hypermedia elements, which are progressively gaining ground in innovative children's books. Furthermore, mapping the structure of a story's plot and depicting literary characters can both assist towards building up new knowledge and graphically imprinting the relations described in the story (Kouklatzidou, 2011).

In addition, raising environmental awareness in primary school students is an essential part of students' education. Environmental education is provided indirectly via school textbooks as well as directly via environmental projects that students take up as part of their study curriculum. In other words, raising

environmental synesthesia and awareness is an elementary goal in every research project in schools. In our case, the goal is focused on recycling and reusing materials.

The research project presented in this paper actively engages students in an integrated digital product. From the initial steps of conceiving a story, selecting and depicting its characters up to designing a digital application which includes all digital and non-digital items created by the students. Still, one might wonder whether there are learning benefits in this process. In what ways can concepts such as digital storytelling, interactivity, hyper-literature, environmental education and research project meet and be combined in a children's story?

2. LITERATURE REVIEW

In international literature there are many articles on digital storytelling (see Glasgow, 1996; Kress, 2003; Robin, 2006; Larson, 2008). Nowadays, technological tool integration in the teaching and learning process has become a necessity. The options and possibilities provided by new technologies in fact make them quite useful in achieving specific learning goals. The study, analysis, production and comment on multimodal texts add a new dimension to learning processes, as students get actively engaged, acquire a participatory role and interact in a cultural and social context. Therefore, it is in fact anticipated that e-books and technological means and tools are gradually gaining popularity and are being integrated in public schools in Greece. Still, how can this anticipated phenomenon be explained?

There are many reasons why someone would properly use new technologies in the learning and teaching process. Recent studies on e-book reading and response behaviors suggested that e-book reading may support comprehension and strengthen both aesthetic and efferent reader response (Larson, 2008, 2009). According to the *transactional theory of reader response*, every student reader comprehends a text in many different ways, especially if he/she reads in more than once. Based on the *transactional theory*, introduced by Rosenblatt (1938, 1978), readers "make sense" of reading experiences as they apply, reorganize, revisit, or extend encounters with text and personal experiences. The activation of individual and group experiences is an essential prerequisite for conducting a successful research project. Furthermore, an integral part of this approach is the fact that there is intense interaction among the reader, the author and the text as the reader engages in personal meaning making of the text (Hancock, 1993). Benefits multiply as students become an integral part of this process, either as text writer or as readers. According to Larson (2010: 21) e-books, and digital readers in particular, have the potential to unveil an array of new teaching and learning possibilities as traditional and new literacy skills are integrated in meaningful ways.

Another basic characteristic of new technologies integration in the classroom is the development of new literacies, related to contemporary digital products and services. According to Walsh and Simpson (2014: 96-106) it is difficult to fully convey the richness of interactions that occurred in the classroom when students worked together or when the teacher engaged the whole class in reading, writing and representational skills through the focused use of iPads or the Interactive White Board. Undoubtedly, a new field, worth researching, is coming up as we attempt to describe how the multiplicative effect of the combination of different modes creates a new meaning (Lemke, 2002). A first step toward integrating new literacies into existing reading programs often involves redefining the notion of what constitutes text, as teachers seek alternative text sources including digital texts and electronic books (Kucer, 2005; Booth, 2006). Nowadays, texts have become multimodal and non-linear. As Kress (2003) comments, the definition of what constitutes "text" is rapidly changing, due to rapid technological changes and shifts.

Bearne (2005) argued that most children are immersed in multimodal experiences and, therefore, have a keen awareness of the possibility of combining modes and media to create a message. In today's classrooms, reading instruction, along with the broader notion of literacy instruction, is undergoing tremendous transformations as new technologies demand new literacy skills (Leu et al., 2004). Still, it is up to the teacher, the students and the resources available, to decide how technology will be used in the classroom and how the learning process will be designed and implemented. After all, as Holloway & Valentine mentioned (2003), schools and classrooms are complex environments and, as we know, their organizational ecology influences how new technology is used.

However, there is a need for further investigation and research on the field, as e-books have been available for over a decade, but researchers have only recently begun to evaluate the quality, benefits, and possibilities of this form of reading (Shamir & Korat, 2006). Moreover, it is worth paying attention to the fact that though multimodal features (animations, sounds, etc.) of interactive e-books may potentially distract children as they read and make sense of the story (Burrell & Trushell, 1997; Matthew, 1996), reading motivation

appears higher when children interact with multimodal texts, especially among children with reading difficulties (Glasgow, 1996).

The increased availability of touch tablets in educational contexts raises issues around how the use of gesture and touch influence meaning-making within digital media (Leonardi, Nardi & Kallinikos, 2010). As we touch a screen, there are multiple mechanisms set in motion in order to make sense of what we do. It is highly likely that more studies on deciphering the mechanisms activated in the human brain during interaction with new technologies, including touch screens, will be conducted and published in the near future. In our contemporary era, when technology is advancing rapidly, many universities around the world (such as Harvard University and Columbia University) study brain-to-brain communication mechanisms. In this context, it could be argued that touch screen technologies can be classified as a mode of applying Halliday's meta-functions (Halliday, 1994) to show that touch can convey meaning at the ideational, interpersonal and compositional level (Walsh & Simpson, 2013).

The research plan suggested in this paper was quite challenging as it set out to observe and record student behavior during multimodal interactions with touch technology whilst also making a point that learning can be enhanced in a school environment that incorporates print and digital technologies with student and teacher interactions. Therefore, we applied a multi-method approach. The teacher along with the students co-decided on a research project which would involve exploring some of the ways in which new technology and interactive applications might transform literacy practices in the classroom. Towards this task, it was taken for granted that technology can both transform the way children write as well as the kinds of texts they produce (Burnett et al., 2006: 11-29).

Meanwhile, within the framework of sustainable development (Brundland Report, WCED 1987) a new worldview of Emancipatory Education for a Sustainable Future is emerging, which envisions (1) a critically thinking educator/student/civilian and (2) an active educator/student/civilian (Kostoula-Makraki & Makrakis, 2006). Environmental education is a field in which issues of severe gravity and importance, due to their immediate impact on human life and environment quality, are being highlighted. According to Kotopouli, Kouklatzidou & Fragkaki (2009), as far as students are concerned, environmental education should give them the opportunity to redefine themselves in their social and natural environment and actively engage in learning processes and actions as co-creators, instead of listeners or observers. Thus, another essential part of the research project is its environmental dimension. Students decided to make up a story, a fairy-tale, in order to mobilize the people in their social context along with their close school and family environment, so as to take up recycling aluminum, paper and plastic. The research project took place during the previous school year and it was conducted as part of a greater action plan taken up by the entire school.

3. METHODS

Evidently, digital narration is a means towards achieving multiple (meta) cognitive and social goals. Within this framework, a teaching scenario was drafted and implemented in a model experimental primary school in Thessaloniki, Greece. This scenario aimed at creating a series of interactive children's stories, on the basis of application user interaction. Working in a technological web-based environment, all stakeholders were given the opportunity to create interactive environmental children's stories, an application for touch screen, including smart phones, tablets and any other Android-based devices. Students made use of the digital application Touchoo, which is available free of charge on <http://touchoo.com/>. The application user can progressively choose among different versions of plot development and reach alternative endings of the story. This paper aims at describing all steps taken towards implementing the learning goals set and creating the digital application.

The teaching scenario is not based on any given lesson included in any of the school subject textbooks used in Greek public education. It describes the process of designing and creating an interactive fairytale, which can be incorporated in any teaching period the teacher sees fit. Emphasis is on writing skills (production of text) and multimodal text design, which both aim at promoting interaction with the application reader-user.

Among the purposes of this research paper is to assist students towards realizing the value of (digital) storytelling along with the existence on non-linear storytelling and critically approaching various technological environments and their possibilities/limitations. By making use of technological software and internet applications, students were asked to carry out a number of activities through which they acquired knowledge, developed skills and literacies and adopted positive attitudes towards culture, art and especially literature and poetry. Specifically, the goals set in relation to knowledge of the world, role-models and attitudes towards life were the following: apprehension of literature as a verbal art, realization of the value of storytelling and fairytales as a means of people's expression of their everyday lives in a particular socio-cultural context,

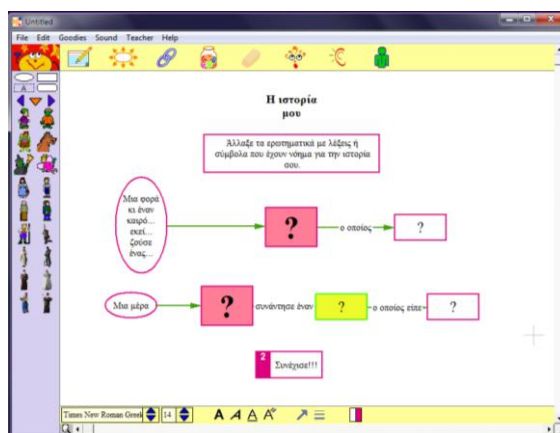
adaptation of cooperative strategies, group-work as part of a joint research project, apprehension of the importance of storytelling as knowledge-information transfer through generations and in time. The goals set in relation to linguistic skills included: development and enhancement of written and verbal skills, storytelling set in motion by audiovisual incentives, context-appropriate authentic text production, information analysis and synthesis, multimodal text creation-processing and formatting, familiarization with storytelling and realization of the functional differences between written and verbal speech. Last but not least, the goals set in relation to literacies' development include: familiarization and use of non-linear narration, focus on audiovisual material and conversion of texts from one form in another, training on interactive application design software, use of digital storytelling software (Touchoo), following digital directions-tutorials, scripting and formatting multimodal texts, creation and use of files and folders where material is gathered as well as development of group-work, cooperative skills.

In order to reach the goals set in the suggested research project, the teacher and her students made use of various teaching practices, methods and strategies. Specifically, group work is a method employed in most of the suggested activities. Furthermore, through experiential learning practices, students had the opportunity to actively engage in various stages of the learning process, whilst working in plenary sessions provided the students with opportunities to express their opinions, to argue on an issue and raise their self-confidence. Thus, the teacher could make use of multiple different teaching approaches, aiming at creating pleasant and intriguing learning environments and delivering useful lessons in creative manners.

4. THE PROJECT

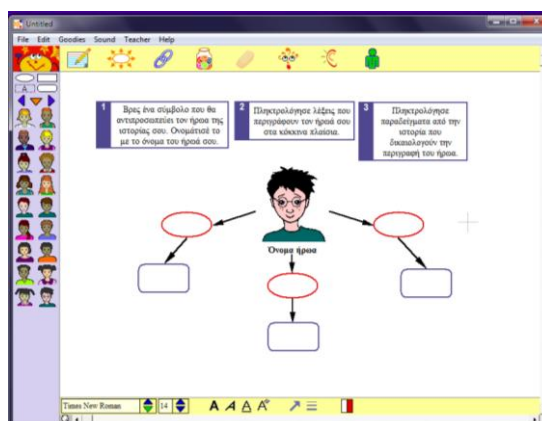
The research project was structured in activities of different duration. Activity 1, which lasted about 3 hours, included a promo video of Touchoo (see <http://www.youtube.com/watch?v=YcmmfCB61G8>) which, though in English, presented the multiple possibilities and choices available to the users as they create their story/fairy tale. The teacher considered this video an appropriate incentive for her students and after the presentation she discussed the options explained in the video and more about storytelling and fairy tale writing in the plenary.

While discussing in the plenary students were able to reflect on the story they wished to create and receive guidance. There are many ways of inspiring and producing a text, a story, which largely vary according to the practice and experience both students and teachers. However, due to the rather young age of the students, the teacher often led and steered the group, without of course intervening on the plot/structure of the story. Then, the teacher handed out to the groups of students a digital worksheet titled "Mapping a fairytale". Via a whiteboard, she projected a file named "Map_My story.kid", which is part of the students' worksheet. The structure presented in this file in fact helps students to begin writing their own story, which is expected to be common, at least in its beginning, for all groups of students. This file is actually a ready-made template in Kidspiration software. As students were already quite familiar with this software, it was mutually decided not to use any other software, which would require extra time out of the project and might confuse students, as it would entail working in new technological environments. Picture 1 shows the template students were based on in order to begin writing their story.



Picture 1. My story_template

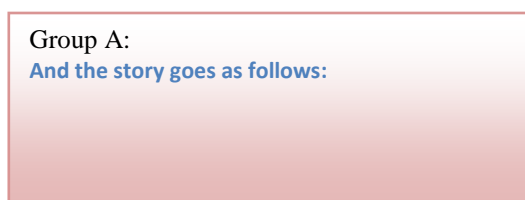
Then, through elicitation, the teacher guided the students towards choosing their story's main and secondary characters. Of course, this choice came out as a necessity as the students started writing a story, since they had to co-decide on the main heroes, the setting, the time/era etc. In order to help the students, the teacher projected on the whiteboard a file named "Map_Characters Name.kid" which functioned as an incentive. This template, which mapped out a hero's personality, traits etc. (see picture 2), helped the students decide that they didn't want human heroes but preferred tins (lifeless objects) instead.



Picture 2. Characters' name_template

Students used Kidspiration in order to structure their story and create diagrams of other elements in the story. Thus, they constructed concept maps which depicted all the basic parts of the story along with its development. Of course, as there are many mind mapping software available, the teachers and the students had to choose only one. So, they went through a process of comparing software available on the internet, thus enhancing their critical skills while comparing software, their possibilities and limitations, their licenses, etc. Still, due to time restrictions, this process did not take place entirely in class but was worked through as a reflection activity at home.

Following concept mapping, the students were asked to work in their groups. After a discussion in the plenary on a common beginning and essential elements for the story, the teacher asked the students to form work groups, in which they would continue the story anyway they pleased. Each group discussed potential developments of the story, more or less subversive ones, and wrote on a digital worksheet that was handed out to them.



Picture 3. Every team decides what happens next in the story.

As soon as all groups completed their stories, a representative member of each group narrated the story in the plenary. Thereby, all the students heard all the alternative plots developed and the original story along with five versions/endings were ready to be used in the activities following up.

The teacher aspired to add music in the stories. Thus, she prompted the students to reflect on the significance of music in a story and how it affects the meaning and the message conveyed. At this point the students were asked to make another choice: to record a piece of music (in free software such as Audacity, Free Audio Editor, Balabolka etc.), compose an original song and sing it or narrate the story on their own and record it. The students chose to compose their own original songs in collaboration with the music teacher who worked in the school. An extract of the song goes as follows:

*Paper, glass and plastic
are all recyclable.
We do not litter
we Recycle.*

*Come join us
to save the Earth together
from this horrible litter,
just go ahead and recycle.*

*Trash and detergents
pile up and litter the
neighborhood.
Paper, glass and batteries
let's not waste them.*

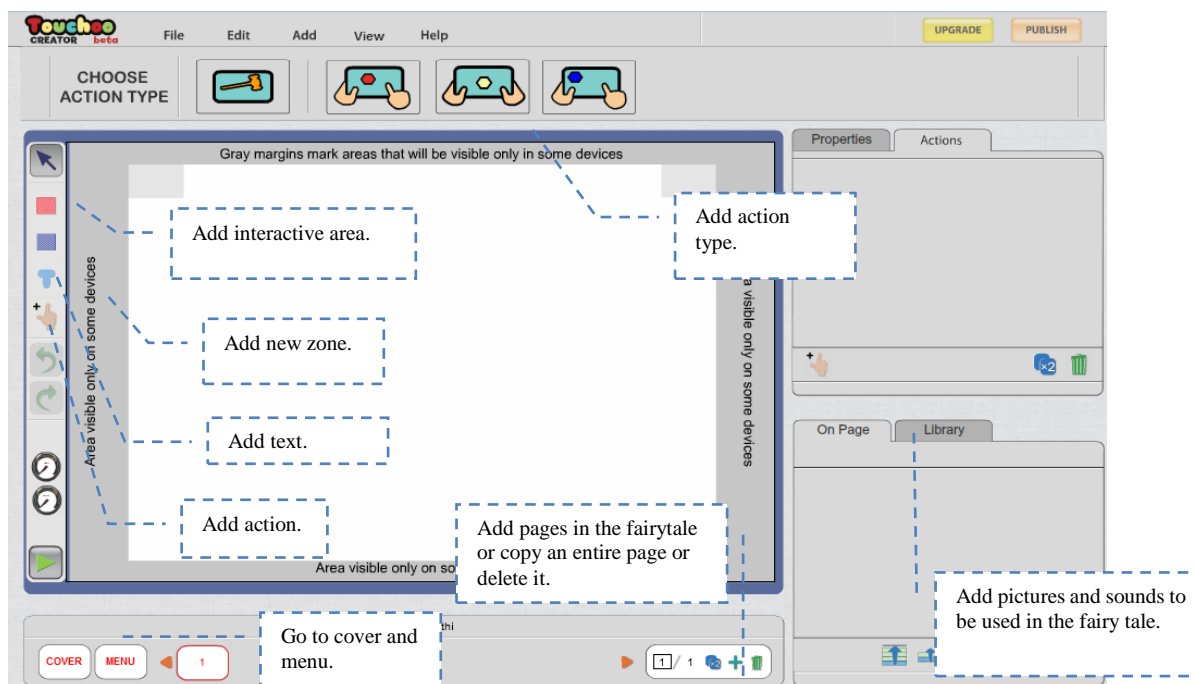
A school recorder available for any class and course was used in order to record the music piece. Then the students processed their recordings, so as to reduce or cut down external noise and remove silent space between recordings of various versions of the songs. This activity lasted about three hours and was then added to the online share folder all students were expected to use for this project.

During the next activity (2 teaching hours) students were asked to art direct their project. Some drew on paper whereas others used drawing software (such as Revelation Natural Art, Tux Paint, Windows Paint, etc.). Most of the students preferred paper drawings which they photographed, afterwards, and converted them to digital photos.



Picture 4. Students' drawings were also included in the digital application background.

During the last activity (6 hours) students were asked to compile all the digital products they had created so as to make up the final end-product, the digital fairy-tale. To this end, it was highly significant that the teacher would be an independent user of the chosen software, so as to guide the students throughout the process, if they requested it so. In the beginning the teacher explained the basic options provided in the software and gradually, as they worked in their groups, the students became confident users. The worksheet initially handed out to them was named "Designing an interactive fairytale" and included all the main steps that needed to be followed towards creating an application. Simultaneously, the teacher projected the application via the whiteboard so as to familiarize the students with the software environment (basic keys and steps).



Picture 5. Clarifications. From the application environment.

Thus, the research project came to a successful end. In his/her individual portfolio, each student gathered all the basic information needed not only to write the story but also to create the application. In addition, this portfolio included a record of each student's role in the project and his/her level of commitment, participation, cooperation etc. All the digital products were uploaded on the class' blog and the school's webpage whilst the application was shared among all the school's students and installed on Smart phones and tablets.

5. DISCUSSION

Among the primary learning goals in Greek primary education is writing and speaking skills development. Nowadays, multimodal texts are constantly gaining ground, so reflecting critically and making wise choices of digital products/software/applications is also becoming rather crucial. The suggested learning scenario focuses on the process of creating a digital story, during which students are the creators, producers, consumers, clients and judges of their own digital end-products. This contact with multimodal texts and digital application allows students to awaken their senses, become critical thinkers and doers and be actively engaged in the digital environment.

The teaching scenario presented in this paper contributes significantly towards understanding hyper-literature, adopting non-linear narrative forms, creating multimodal texts and designing digital applications integrated in new generation media and technologies. Some of the activities included in the scenario can be implemented without the use of computers and/or interactive whiteboards, as many classrooms in Greece are still not fully equipped. However, all teachers and students are prompted to use new technologies in the classroom, as they enhance the students' digital and critical literacy skills.

Furthermore, this scenario can be used in any teaching unit the teacher wishes, as it focuses on writing (story and fairy tale writing). The end-products can be printed and presented in an illustrated book, which will help students distinguish similarities and differences between the two versions (e-book and printed book). Students could become familiar with non-linear narration techniques by reading printed books employing non-linear narration, such as "33 rubies" and "88 dolmadakia" by Eugene Trivizas etc. These reading activities can function as starting points which set off discussions towards producing a similar scenario.

This paper presented a learning scenario designed and implemented by students attending a pilot experimental school in Thessaloniki, Greece. All stages of the project were presented, starting from the goals and purposes, the development of a working plan, the structure and the activities included. Then, the key points of the activity implementation were presented along with the end-products thus combining a theoretical background with its practical application.

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