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From early childhood to special education: Interactive digital storytelling as a coaching approach for fostering social empathy.

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Abstract

Much research is being conducted over the years about the social inclusion of individuals with special needs. These individuals have to face their own deficiencies in social interaction, but also the social exclusion by other members of their environment. This results often in isolation and the enhancement of their social problems, especially in the case on inclusive classrooms. In this paper, a case study regarding (social) empathy fostering in early childhood with the exploitation of the interactive digital storytelling approach is described. The results were positive. Considering the incomplete development of social dexterities of 3-5 year old children and its similarity to social deficiencies of individuals with special needs, this paper builds a discussion upon the exploitation of the same technique within Special Education as a future research path.

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Keywords: digital storytelling; special education; emotional intelligence; empathy; preschool education

1. Introduction

Undeniably, research upon the social inclusion of children with Special Needs is carried out over the years. In many cases of such children face twofold problems; on one hand their own social deficiency and on the other social exclusion by their environment. In both situations, significant research has been conducted regarding emotional

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intelligence and in particular empathy and its social extensions. This issue is equally important when it concerns the social skills of children with special needs and the social behavior of others towards these children.

This paper builds a discussion upon a case study which aimed at fostering the social empathy of young children (aged 2.5 to 4.5 years) by exploiting an interactive digital story as means of teaching intervention. Since social capacity is similarly limited in the cases of very young children and children with special needs, the results of this study serve as a foundation for the exploration of utilizing interactive digital storytelling as a tool for foster social empathy and, at extension, emotional intelligence for children with special needs, regardless of them belonging to a special education or a normal inclusion classroom. Moreover, this approach could be exploited in other, equally important aspects of the lives of children with special needs, spanning from the family environment to the wider social environment and cases that need further attention, such as adoption of such children.

The paper is structured as follows; initially the theoretical background is presented, focusing on the notions of social cognition and pro-social behavior, empathy and storytelling. Then, the aforementioned case study is described and results are presented. Lastly, a concluding discussion attempts to correlate this case study with special education and raise questions for future research which would exploit interactive digital storytelling for fostering empathy and social cognition, not only for children with special needs but for the members of their immediate environment as well.

2. Theoretical Background

The theoretical background for this paper focuses on two directions. The first one regards emotional intelligence and especially empathy and its social extension. The second one regards digital storytelling and its educational exploitation, mainly through interactive narrative and personal coaching.

2.1. Emotional intelligence and Empathy

Emotions hold a significant role in one's life by guiding and directing behavior. They refer to a feeling and its distinctive thoughts, psychological and biological states and range of propensities to act [1]. Emotional intelligence is the combination of cognitive, affective and conative domains, referring to the capacity for recognizing own and others' feelings, for motivating oneself and for managing emotions well internally and within interpersonal relationships of any kind [2]. In this vein, emotional intelligence is a key factor for academic and professional achievement, as it is a set of socio-emotional skills which enable the intellect to turn into action and accomplishment. Moreover, academic discipline and group well-being rely significantly on intra-group relations.

Humans build up the capacity to care for others form an early age [3], by being able to understand another person's need and provide help when needed [4]. Children respond with empathy and prosociality, thus offering their help already by the age of 18 months [5]. Several studies highlight the importance of developing Social Cognition [6], an area that includes children's Theory of Mind, Empathy and Emotion Understanding [7].

Empathy, a fundamental component of social cognition is a complex construct and a specific social cognitive ability related to taking part in the suffering of other people [8]. It encompasses a cognitive dimension which involves the capacity to see things from the perspective of others and an affective dimension that involves sharing other people's emotions [7]. From the school years, children are able to understand that their feelings can be a reaction to something that happened to another person. They are also increasingly helping others by sharing objects and assisting in emergency situation, whereas empathic disposition is directly related to prosocial behavior [9]. Despite its significance, there is a minimal set of studies which focus on empathic training procedures, apart from the cases of bullying prevention [10], but also regarding Emotion Understanding. Such studies [11],[12],[13] concern mainly primary, normal education.

2.2. Social empathy & Special Education

Empathy is an important issue within special education in two basic directions. The first regard students with special needs themselves, such as individuals with problems of the autistic spectrum (AS) appear to have deficits in social perception and cognition, subtle impairment, of verbal and non-verbal communication, presence of

idiosyncratic isolated interests, and repetitive behaviors [14]. Although social interaction from people AS problems often increases as they age [15], they merely face the inability to social relationships which makes almost each one of their activities difficult to fulfill [16]. Even when their linguistic and perceptive capabilities are enhanced through proper training, these individuals still have difficulty understanding others, and often focus on subjects without considering others. Social skills training is intended to improve or enhance positive interpersonal behaviors [16]. Sharing with others and thus interacting socially requires empathy. Although this lack of empathy for people with AS problems has been documented not much work exists on teaching them how to empathize and thus be more able to socially interact [16]. Similarly, individuals facing other problems which fall under the special needs category may face social interaction problems, but not at the same extend (e.g. mental disabilities).

The second direction which makes empathy significant for special education regards the social behavior of other towards individuals with such deficiencies and/or disabilities. Being different from what is considered to be "normal", they usually reach the point of social withdrawal. According to Frostad & Pijl [17] children who master social skills insufficiently have difficulty in communicating and relating to others. They experience problems in playing, working and learning with other children, which may well result in a certain degree of isolation. In school settings they typically run the risk of being ignored or rejected, of not acquiring membership of a group and of having no friends. These children sometimes face aggressive behaviors, being frustrated with their disability[2]. With this type of rejection, the sense of belonging at school is hindered, thus downgrading the self-image, self-confidence and at extend the motivation and school performance of such children. Especially in the case of inclusive classrooms, in which people with special needs are integrated into a normal classroom, the sense of belonging is extremely important. This makes the need for also people with no deficiencies to be trained on how to socially interact with people with special needs. Although a lot of work exists regarding the social training of people with special needs, disproportionally little work regards the social training of "normal people" on how to socially interact with the former. This is equally significant in younger ages, where often "special needs" are not yet adequately understood by peers or even diagnosed properly.

Thus, empathy related training seems to be of great importance, considering that it is a core constituent of emotional intelligence and this, at extent, is the fertilizer for social interaction. The latter is the basis of knowledge construction according to Vygkotsky's sociocognitive theory, upon which more or less contemporary learning systems are build.

2.3. Digital Storytelling

"A story might be defined as a series of sentences that describe some sequence of actions, events or experiences, usually related to people as actors in the story. People depicted as characters in a story are usually presented in some characteristic human situations to which – together with the factors and changes which affect that situation from outside – they react and change it. With the development of the story, these adaptations and changes both of the situation and characters reveal to the follower of a story hitherto hidden aspects of the original situation and of the characters and expose a certain predicament that calls for an action or a change that would solve it." [18].

Storytelling is one of the oldest methods of communication and learning. For thousands of years societies have taught key principles through storytelling [19],[20]. Over the ages, numerous human problems, emotional and psychological deadlocks have been dealt with through stories and tales, by propounding heroes who experience similar situations as the audience at the same time. As such, storytelling is a familiar means of facilitating young children's confrontation with life aspects, situations and socially problematic conditions which will probably deal with in their future and thus be prepared. Issues like mental sensitivity, compassion, solidarity, sympathy and empathy for our fellow man, beyond divisive separations are promoted via stories. Moral consciousness and ethics can be introduced to children in this manner, but moreover, stories can be a significant aid for children with special needs and problematic behaviors [21]. Through storytelling, the audience lives the stories, experiences and learns how to empathize with the heroes. Thus, stories can be a great tool for fostering emotional intelligence and empathy. Several research works can be found in the literature in this direction [22],[23],[24],[25].

Digital storytelling is the combination of traditional, oral narration with multimedia and communication tools [26]. It is a form of art which combines different types of multimedia material, including images, text, video clips, audio narration and music to tell a short story on a particular topic or theme [27]. Digital stories can be stored or

published on the internet, allowing people to review, critique and discuss upon them, thus enhancing their educational value and their life span [26]. Interactive digital stories are the focus of the case study, presented hereinafter.

3. A case study in preschool education

From the theoretical analysis in the previous chapter, two issues become evident: a) emotional intelligence and its various constituents should and can be fostered via educational interventions which are rather sparse, and b) empathy is equally important to be enhanced in both people with special needs and their social environment so as to enhance their social interaction. In this vein, the case study described in this section intended to examine if interactive digital storytelling could be exploited for teaching social empathy to minors.

Reviewing the literature, one can find work regarding empathy and emotional intelligence enhancement, carried out mainly with populations over six years of age (Primary school and beyond). Considering the evidence that these elements fortify children socially against a variety of social and/or personal problems and conditions, also for the subsequent years of their life, this case study was conducted with a younger target group. The goal was to investigate if the children could develop empathic behaviors through an interactive digital story. For that matter, the Scratch programming environment (http://scratch.mit.edu/) was used for implementing a partially modified, interactive version of a famous Greek fairy tale, titled "The sad little bear", written by Evgenios Trivizas.

3.1. Digital Storytelling

An interactive digital story titled "The sad little chicken" was designed and implemented via the Scratch programming platform. The main character is Akis the chicken (actually it rimes in Greek) who attends the animal school. Akis is in a rather unpleasant emotional condition which is projected in the social part of his school life. The setting of the story is the school classroom and the courtyard, the nearby park and a basketball field. The reasons for Akis' emotional condition were intentionally not mentioned, leaving the audience to reflect upon them and decide for themselves (probably based on their own experiences).

During the school day, all the animals seem happy in their everyday life, except from Akis who looks unhappy and isolated in the various story settings. The interaction occurs when the listener of the story is prompted to think and decide whether he/she would attempt to approach Akis and assist him by asking him why is he sad. Depending on the decision the evolvement of the story is different. Eventually, the positive sequence leads to Akis playing happily with the other animals and the negative sequence leads to a last scene in which Akis is no longer present and the narration mentions that "if only someone cared enough, maybe the ending of this story would have been different" (freely translated from Greek).

3.2. Research methodology

The research was conducted with the participation of 25 children from the 6th early childhood education department of the daycare centers of the Kavala Municipality, in Greece. The sample was belonged in two classes; class A included children 2.5 to 3.5 years old and class B children 4 to 5.5 years old. The children were equally divided in two groups, an experimental (consisting of 14 children) and a control group (consisting of 11 children). The main criterion was that the experimental group was divided into 7 dyads comprising of a girl and a boy.

The research approach was divided into three phases. In Phase A the "world of emotions" was introduced to all the children and the existing knowledge of fundamental emotions (joy, sadness, fear, anger) was recorded, through whole-class discussions (separately for Class A and Class B). Illustrated books and plastic figures were used as visual material (Fig. 1) and additional activities, such as role playing experiential games (e.g. "Do as I do", "The mirror of emotions") and painting. During this phase, video and audio recordings, researcher's journal notes and photographs were used as data collection instruments.

a b

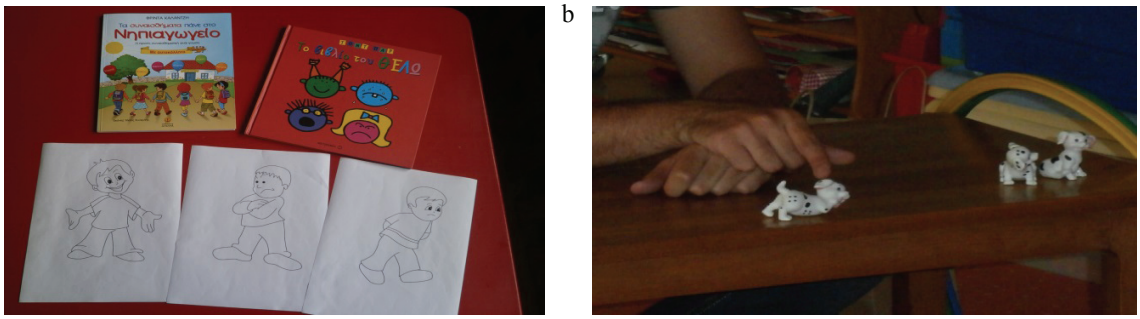

Fig. 1. (a) book illustrations of emotional states; (b) plastic puppies representing emotional states.

In Phase B the interactive digital story was exploited and only the experimental group participated in dyads. The children watched the story twice. The first time was intentionally interrupted only to pose the choice-questions, so that the children could perceive the content as a whole. The second projection was accompanied by a more detailed discussion with the children so that they would better understand the concept of the story and reflect upon their choices and their consequences on the evolvement of the story. During this phase the researcher operated as a coach, posing reflective questions to the children. The data collection instruments used were the same as in the previous phase.

During Phase C, the degree in which social empathy was developed was investigated through semi-structured interviews. The questions were related to the story of Phase B, but also aimed at emerging their personal, similar experiences. Moreover, the researcher was observing the children throughout their school life for two weeks, in order to capture action which revealed empathic behavior towards their classmates. This would verify that social empathy was being developed.

3.3. Research questions

Four research questions were formulated:

1. Can social empathy of preschoolers be enhanced through interactive digital storytelling interventions?
2. Are the overall emotional background, the personal needs and experiences of the children reflected during the digital story projection, but also prior and after that?
3. To what degree is collaborative discourse and social interaction fostered during the projection of the interactive digital story?
4. At which extend did the children draw satisfaction out of the story projection?

Mainly research questions 1 and 2 are examined in this paper.

4. Results

A qualitative analysis of the collected data was carried out in order to answer the research questions. During Phase A, all the children appeared to present similar levels of emotion recognition and empathic attitudes. They were able to recognize the fundamental emotions, based on the visual information they were presented with (illustrations). They were able to project themselves on the visual representations and justify their choices in matters of emotions, by formulating hypotheses. For example, they recognized a sad person and stated that “he is sad because someone must have scolded him” or “the other children do not want to play with him”. They recognized a happy face of child who was “probably playing with his friends at the park” or “someone just bought him some ice cream”. In some cases they tried to resolve emotional deadlock by proposing actions, like “they should ask him to play with them”, “they should give him a hug” or “they should ask him what is wrong”. The overall discussion attracted the children’s attention and motivated them to participate in the following activities.

The next activity involved plastic puppies who participated in imaginary scenarios. For example, in Fig. 1b two of them are playing together and a third one is just sitting down further away, staring at them. The students were asked to guess and describe the emotions of each puppy and propose solutions in the case they identified an unpleasant situation. Several scenarios were discussed, both with Class A and Class B. Furthermore, other experiential activities were carried out. For example, they sat down in dyads, playing the game "Do as I do" and trying to recognize and replicate the emotion of their pair (Fig 2a). Another example is "The support group" game in which one child would sit in the middle and describe when he/she would experience various emotions (happy, sad, etc.). This activity aimed at enhancing the emotional hearing of the members of the support group (surrounding children in Fig. 2b). With the term emotional hearing, we describe the tendency to patiently and with attention hear what the other has to say, especially when he/she wishes to describe emotional states.

a  b 

Fig. 2. (a) Do as I do game; (b) The support group game

Having ascertained that children from both classes and thus from both age groups were at a similar level of emotional recognition and intelligence, with no apparent differences in matters of sex and age, Phase B was carried out. The dyads' discussions were transcribed and the content was analyzed. Furthermore correlations were made with the children's nonverbal actions and activities, as they were recorded in both the video recordings and the researcher's journal.

Considering the first research question, the possibility of enhancing social empathy of early childhood children via interactive digital storytelling was to be investigated. Based on the results, there is an overall positive evaluation. More specifically, almost all the members of the experimental group were able to recognize the emotions of the heroes within the digital story. They were very interested in and sensitive towards the emotions of the central hero, prompting for empathic concern for his emotional state. More important was the fact that all of them spontaneously connected the emotions of the story-characters and the interchange between them with the story plot and the narration evolvement, formulating hypotheses about the characters' actions and the possible causes for their emotional state. Eleven out of the fourteen members of the experiential group formulated unique hypotheses, whereas the remaining three concurred to the hypotheses of their pair. All of them though, tried to justify the emotional state of the central character of the story, Akis the chicken.

Furthermore, they appeared to understand the significance of empathy on a higher level, by connecting their perceptions from the story and the reactions of the characters to their own experiences from their everyday school and family life. They all provided experiential examples of situations similar to the ones they decoded from the digital story. During the semi-structured interviews, in Phase C, they provided even more examples in order to indicate why being empathic towards others is important. Thus, real life and digital story connection occurred by the children themselves, indicating that they fully conceived the message, intended to be transported; (social) empathy is important and one should act sensitively and offer help to the fellow humans when needed.

The determinant factor for reaching a conclusion was the intensive observation of the children's behavior after the intervention of Phase B. Apart from the fact that all 14 members of the experimental group seemed to understand the significance of empathy made direct connections to their own experiences, more than half (8 out of 14) actively proved that they conceived the concept of social empathy. This was proven by observing them to express empathic behavior towards others within the school setting. For example, on girl offered one of the games that she had brought from her home to one of the boys who was obviously feeling sad and depressed in order to make him

happier(example 1). In another case a girl approached another who was wandering rather sad around during the free playing time, gave her a hug and invited her to join herself and play together (example 1). In a more practical example, a boy spontaneously rushed to help another boy to carry a box of toys and place it in its storage space, after realizing that the second boy was limping because of a leg injury he had (example 3). Another example is shown in Fig. 3a were a girl was sitting isolated and sad during play time and another girl invited her to play together at the "grocery corner" (Fig. 3b and Fig. 3c) of the classroom (example 4). A final example, among many that were recorded was the case of a boy who witnessed the hug among the girls in example 2 and decided to offer an additional hug to the depressed girl (Fig 4), thus attempting to enhance the empathic behavior towards her. All these examples indicate that the children fully understood the concept of empathy and its significance, especially since such practical behaviors were not observed by any child of the control group during the observation period. Their empathic response rate was the same throughout the whole research period.

a b c

Fig. 3. (a) a girl sad and isolated; (b) another girl invites her to play together; (c) they happily play together.

Fig. 4. Three children sharing a hug.

It is important to note that after the research period, such empathic expressions appeared constantly and with gradually increased frequency. Consequently, it is obvious that it is possible to foster social empathy through interventions which include interactive digital stories. The direct visual feedback of the children's choices operated as a highly reflective tool, facilitating the consideration of the proper behavior and the connection with real experiences, following the constructivistic approach in knowledge building.

The second research question regarded the overall emotional background, the personal needs and experiences of the children and if those are reflected during the digital story projection, but also prior and after that. As already stated, all the members of the experimental group presented examples from their own experiences in order to explain

themselves and justify their hypotheses on how the story characters were feeling and why. The examples were both from their family and the school environment, which merely constitute the totality of the social environment for children of these ages. While watching the digital story in pairs, they discussed together in order to decide upon their choice for the continuation of the story. These discussions highlighted more their needs and further facilitated reflection. It is interesting to mention that 3 of the 7 pairs decided to devote more time in order to examine all the possible story evolvements (by making the appropriate choices when prompted to). This "curiosity" assisted them in better realizing the consequences of high or low empathic behavior in everyday life. Also, the fact that empathic behaviors were observed after the digital story intervention indicates that the emotional background of the children was evident and supported their decisions and actions.

Fig. 5. Children observe various emotional expressions in the mirror

Fig. 6. Children pretend to empathize with an individual in emotional stress.

After the completion of Phase B, some of the members of the experimental group continued to reflect upon the issue of empathy. For example, they were practicing facial expressions in front of a mirror (Fig. 5) or they were pretending to empathize with an individual in emotional stress (Fig. 6). Concluding, it is safe to answer the second research question affirmatively.

5. Conclusion

The case study which was presented in this paper aimed at investigating if and at what extend can a teaching intervention which exploits interactive digital stories can foster and/or enhance empathy of early childhood children, specifically its social constituent. The results indicate that this is actually possible, as the intervention can be evaluated as successful and fully compliant with earlier research work, like that of Paiva et al. [28] and Adcock et al. [29]. Not only did the children recognize the emotional states of the characters, but they also formulated

interpretation hypotheses, created direct connections to their personal experiences and drew conclusions about the significance of empathic behavior in their everyday social interactions.

Of course there are many limitations, as this was a small scale case study. Also the duration of the study was rather limited in order to generalize the results, at least for the population under research. A long term intervention with more than one interactive digital stories which would be related to more aspects of emotional intelligence would further solidify the derived results. More time available would also allow a larger time distance between Phase B and Phase C, allowing observations in search of everyday empathic behaviors within a wider time frame. This would allow also more solid conclusions to be drawn. Also a comparison between similar interventions which would utilize interactive digital stories and a more forward teaching approach could further strengthen the claims of this study.

Extending the findings of this case study to reach the scope of this paper, some concluding remarks regarding its correlation with emotional intelligence in general and empathy particularly in special education will be made. As stated in the theoretical background section, emotional intelligence and empathy hold a significant role in the lives of people with special needs, in two major directions. The first direction is that of such individuals who face social behavior related problems (e.g. individuals with Autistic Spectrum disorders or mental deficiencies). There is a lot of work in the literature about training such people in order to enhance their social behavior, mainly focusing on emotion recognition. Less to almost no work is available for correlating emotion recognition to behavioral patterns, in an attempt to enhance social interaction and the sense of belonging for these individuals. This is even more important in the case of milder cases of people with special needs who are educated in inclusive classrooms, having to socially interact within a wider school environment with normal individuals. Equally important is the training of the latter in order to understand what people with special needs feel, how they perceive behaviors and why they react in specific manners. It seems important, especially in young ages, to see the world from the eyes of the people with special needs in order to fully understand their attitudes. This way, it would be easier to reach out to them and make them feel that they actually belong in a wider community.

Digital storytelling is a teaching/training methodology which successfully implements that. It allows one to experience new perceptions of known issues and circumstances, thus reflecting deeper upon them and facilitating the enhancement of emotional intelligence. Considering that humans at the age of 3 to 5 years are not yet mentally or socially developed fully, occasionally having similar evolvement with older individuals with special needs [30] and taking into account the power of digital storytelling as it is documented in the literature, the concluding comment is that approaches such as the one presented in this paper look at least interesting to try. Stories allow deeper understanding of abstract issues and notions. They facilitate engagement by allowing experiencing, rather than training in the form of tutorial instruction. This is more intriguing for the cases of emotion recognition and intelligence at extend. Besides, the storytelling approach, digital or not, is already starting to appear in research in the area of emotional intelligence and empathy fostering. For example Faver and Alanis [22] exploit stories which describe the relations of humans and animals in order to foster empathy to young children, claiming that emotional and social empathy for animals is similar to empathy for people. Unnsteinsdóttir [23] utilized sandplay and storytelling for facilitating children's emotional-behavioral development. Sierksma et al. [3] propose the exploitation of short films and combinations of stories and images which are more vivid for enhancing emotional intelligence. Banks [25] exploited storytelling in her research for social equity.

Concluding, a research trend including the exploitation of digital storytelling, interactive or not, seems to be emerging already in the field of emotional intelligence and its constituents. This paper proposes a final claim that this trend could be further extended in special education for the facilitation of emotional and social intelligence, social inclusion and equity and social interaction, applied both in training approaches for both people with special needs or people who could potentially relate with them in any way. Towards this direction, the authors are working on creating an interactive digital story which will present everyday life and normal social interaction through "the eyes of an autistic child" in order to foster empathy of normal children towards autistic children, especially in inclusive classrooms.

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