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TITLE: «WEARABLE E-TEXTILE AS A NARRATIVE MEDIATOR FOR ENHANCING EMPATHY FOR MORAL DEVELOPMENT»

MASTER'S THESIS

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Assessment Sheet

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I would like to dedicate my Master's Thesis to the rare few individuals in my life, family and friends, who always stand by my side, even though we are miles apart.

Abstract

A critical moral issue education has to deal with is that of bullying. Recent findings in Education have noted that bullying might be associated with empathy. Many prevention bullying programs have used narratives and Storytelling as an effective method to promote empathy. In recent times several studies have been conducted which focus on the creation of new storytelling media that can enhance empathic skills. This study was focused on the creation of a new type of storytelling medium that attempts to both activate the user's embodied experience and promote the user's feeling of presence in the mediated narrative world, with the exploitation of an e-textile. A "digital dictionary" was also created for the effective use of the wearable e-textile as a narrative mediator that enhances empathy. In this study, 10 students (6 boys, 4 girls) aged 11 and 12 wore the e-textile, watched and listened to the narration. The evidence of the questionnaire and interviews imply that participants enjoyed their interaction with the wearable e-textile. The results also suggest that the e-textile operated as a narrative mediator, it enhanced participants' empathic connection with the characters and this might have led not only to a non-bullying behaviour but also to a more defending action in future bullying situations. In conclusion, these results suggest that wearable e-textiles, in combination with a narrative, could prove invaluable tools for helping the moral development of students.

Keywords

Wearable E-textiles, Empathy, Bullying, Narrative, Storytelling, Digital Dictionary.

Introduction

The current research has been conducted as my Master's Thesis for obtaining a Master Degree in Educational Sciences with Specification in Pedagogy and New Technologies. The study has been designed based on the previous research results for the exploration of the wearable e-textile use in Storytelling, which had been contacted by UOWM students. However, the current research focuses on the creation of a "digital dictionary" for the effective use of the wearable e-textile as a narrative mediation tool. With the creation of the "digital dictionary", the study aims to find out visual mediation types that can transform the wearable e-textile into a narrative mediation tool that promotes empathy.

Empathy seems to be vital for creating meaningful relationships in the social world, since the perceptual and behavioural processes that entails might facilitate group living, be beneficial for social interaction (Batchelder, L., Brosnan, M., & Ashwin, C., 2017) and effective education (Gottman, 2011). Greater empathy it is possible to correlate with prosocial behaviour and social competence across the lifespan where children and adults are more likely to share, care and help others. In early childhood, poor relationships with peers, hostility and bullying can be associated with low empathy. Bullying is an important moral issue education has to deal with or even to prevent it. More specifically, recent findings in Education have noted that bullying might be negatively associated with cognitive and affective empathy (Noorden et al., 2015). Education has made reasonable efforts to confront this problem by aiming to promote the cultivation of empathy in students. Nonetheless, recent evidence suggest that subtler methods of instruction would be more effective for the cultivation of empathy at school. Also, previous studies have underlined that Storytelling can evoke empathy and the sense of identification with the characters, as well as the fact that the sense of being present in the story can enhance the effectiveness of Storytelling. This has led me to the creation of an innovative narrative mediation tool. The specific tool wants to make good use of body and senses (visual and auditory), in a smart and fun way to help students to create the suitable mental representations, which in turn will conduce to the promotion of empathy in students.

I would like to thank the following people for their support, without whose help this work would never have been possible. I am particularly grateful to my supervisor George Palaigeorgiou for his valuable suggestions and discussions, as well as for the guidance and supervision of my Master's Thesis progress. Also, I would like to gratefully acknowledge the ongoing technical assistance for

Review of Literature

Empathy

Nowadays, empathy has been promoted as an essential aspect that should be fostered within society. Empathy seems to be vital for creating meaningful relationships in the social world, since the perceptual and behavioural processes that entails facilitate group living, are beneficial for social interaction (Batchelder, L., Brosnan, M., & Ashwin, C., 2017) and effective education (Gottman, 2011). Being able to feel or identify with another person's emotional experience is generally defined as empathy and this ability to empathise with others is a fundamental stage in our emotional development (McDonald & Messinger, 2011). Being able to understand and demonstrate empathy means, in turn, an individual is more likely to show compassion towards others and display a willingness to help others experiencing difficulty or distress. Therefore, understandably, a person's ability to empathise migh impact upon their interaction with others and the quality of their social relationships. The lack of empathy is used as a key diagnostic tool in psychopathic conditions as individuals with these personality types tend to have a complete disregard for others, do not experience guilt and have little understanding of the impact of moral wrongdoing (Decety & Cowell, 2014). So fundamentally, our society relies on empathy to enable us to form connections, relationships and communities and to live and work alongside one another in relative harmony.

Emotional contagion or the ability to share emotions is the most basic form of empathy and is displayed in not only humans but across a number of different species, including rodents. Many studies have shown this to be true including an examination of fear responses in mice, where female mice demonstrated increased fear response behaviour such as freezing when a close relative was in pain than when they observe a more distant relative in pain (Jeon et al., 2010).

Although psychologists and researchers are still trying to define what empathy exactly is, it is generally accepted that there are two types of empathy; cognitive and affective or emotional (Davis, 1983).

Cognitive Empathy

Cognitive empathy is also known as "perspective-taking" and is the process of thinking and understanding another person's opinions, thoughts and feelings (Shamay – Tsoory et al., 2009; Gottman, 2011). Although we can view the situation of another person from their point of view or

perspective, it remains at this cognitive level. This kind of empathy can exist without sympathy and therefore, is often found in keen negotiators or motivators.

Affective (Emotional) Empathy

Affective or emotional empathy occurs when an individual not only intellectually understands what another is going through but can also emotionally identify with what they are experiencing (Shamay – Tsoory et al., 2009; Batchelder et al., 2017). This shared emotional response has been shown to also increase in the willingness to help others and therefore being able to emotionally empathise is likely to benefit our relationships. The disadvantage of emotional empathy is that individuals may suffer from an emotional overload or 'burnout' when identifying strongly with many intense emotions of others and may experience personal distress themselves.

Morality

A second key concept and one that leads on from the idea of empathy is that of morality, as one generally must have an ability to empathise with others, to aid them in actively displaying moral behaviour. However, these two terms should not be thought of as interchangeable as research has shown that these are two separate motives and in certain situations, an individual may choose to display immoral behaviour even though they have developed empathetic skills (Batson et al., 1995).

Morality is the set of principles of beliefs about the choices between good and bad or right and wrong with moral decisions being those that are generally accepted as right or good.

Early Moral Development

Previous research has demonstrated that infants are sensitive to inequality and by the time they are toddlers they are demonstrating prosocial and moral actions; actions such as helping, sharing and co-operating which are to the benefit others (Schmidt & Sommerville, 2011). There is then a significant change in sharing behaviour between early infancy and the later childhood years; however, the mechanisms behind this change have not yet been fully understood. It is known that the idea of fairness demonstrated through behaviour becomes apparent in later childhood when a

child's approach and understanding to sharing and the process of equal distribution is developed (Fehr et al., 2008).

As previously discussed, human empathy is a very complicated subject, and several different aspects of empathy, including emotional sharing, perspective-taking and empathic concern are all interlinked with the perception of distress and development of moral understanding. Each of these aspects of empathy will impact on the moral understanding and development differently and will produce distinctive consequences regarding moral behaviour.

There is thought to be a significant environmental impact on the development of early pro-social choices with social and cultural factors leading to the development of the morality that we understand as adults, which is a very complicated combination of emotional, cognitive and motivational processes (Decety and Howard, 2013).

A recent study (Cowell and Decety, 2015), observed electrical activity in the brain along with eye-tracking and behavioural sharing monitoring to investigate the moral understanding in 3 to 5-year-old children. Distinct patterns of neural response were demonstrated dependent on whether the children were watching characters engaged in helpful behaviour or harmful behaviour. Different patterns and waveforms also predicted the presence of genuine generosity. The researchers concluded that cognitive and automatic neural processes both contributed to underpinning social evaluation and the theories of moral development in children, as well as the presence and development of prosocial behaviour can be traced using these neural signatures.

As ageing progresses, it is clear that what begins with the perception of distress and formation of empathetic skills also includes aspects of sensitivity to harm and affective arousal, which in turns leads to aversion and fairness. Research has suggested that this process is circular and can result again in empathy and pro-social behaviour which is empathically led (Chen et al., 2018).

Promoting Moral Behaviour

As more about the development of empathy and moral behaviour is understood in children and young adults, it is important to subsequently attempt to understand how this development can be promoted, and the process of emotional self-regulation can be encouraged. In fact, many schools around the world are legally required to promote the moral development of their pupils. Moral development is as vital as physical and intellectual development. Building moral lives and having

moral values integrated into daily thoughts, feelings and actions is essential to any democratic society. The role of education in preparing young people to fit into society has been widely acknowledged (Althof, W., & Berkowitz, M. 2006) and its aim is not merely the production of good learners, but good people (Kohn A., 1991). Hence, schools are in charge of educating not only the children's mind but also their heart.

Moral education typically involves programs which are deliberately created to facilitate school-based moral development. Moral formation in children can be described as cultivating the feelings and intent for moral subscription. Children are given guidance as to what is morally right and taught that they will be rewarded for making the right decision and punished for doing wrong. Models of good conduction and models of appropriate reactions to others conduct are also taught. In this way, through having their behaviour regulated, children should begin to understand self-regulation of behaviour, and by understanding the feelings and reactions of others should begin to emulate moral behaviour themselves. A more sophisticated model of moral education is to promote moral inquiry in children where they are encouraged to reflect and discuss moral values and what is right and just. This moral inquiry should justify common morality and lead to a deeper understanding of what morality is for and why it is required in society.

Modern moral problems, like bullying, racism and violation can be encountered and prevented by transferring and cultivating moral values in children. Bullying is a serious modern moral problem affecting children and youth all across the world. Ways to prevent and deal with bullying have been the subject of much research in education. Nowadays, it is a well-known fact that aggression and intimidation are tied to a lack of empathy (Birch, 2016). Empathy helps people to connect, by making them "feel with each other".

However, the difficulty is that often the existing moral education packages that are available to school have a weak influence on pupils (Meindl et al., 2018). A large piece of research into seven promising social and character development programs, measuring outcomes over a three-year period, found no evidence of resulting behavioural or social improvement (Social and Character Development Research Consortium, 2010). Research has suggested that schools should concentrate on offering less direct and explicit forms of moral education (Meindl et al., 2018). Originally, moral instruction involved teaching the terminology around the moral vocabulary and instructing children how to understand moral dilemmas and the correct or appropriate responses in these situations.

However, recent research suggests that subtler methods of instruction would be more effective. As well as focussing on developing caring and supportive communities and relationships to create a strong school network, there is the suggestion to embed evidence-based practices into the curriculum covertly, providing moral education to students in a more subtle yet more effective way.

Immoral Behaviour in Children

In contrast to the above idea that children develop a more cheerful and moral attitude in a positive school community and environment, children experiencing a toxic school culture may develop negative behavioural traits (Rahiem et al., 2012).

The Impact of School Culture on Moral Behaviour

Children spend a large proportion of their time each day in school. Therefore, it is not surprising that a school's culture has a significant impact on the moral development of its students. School culture is defined as the gathering of many different individuals' values and norms and determines the expectations of the group. School culture acts as a communal entity of shared customs, beliefs and behaviours. Researchers see culture as dynamic and continuously changing based upon the social interactions and relationships of the individuals within the school.

Some view school culture as positive or toxic (Peterson & Deals, 2002). In positive culture environments, students like being at school. They feel positive and hopeful. In a toxic culture, students lack community, which results in feelings of separation and frustration. They lack the foundation to form a belief about a shared culture, which results in complacency. Without knowing about the need for improvement, higher incidences of bullying may take place.

Bullying and Empathy

A lack of empathic responsiveness has been underlined that might be a characteristic of bullies. Frequent bullies have been shown to demonstrate lower cognitive empathy than non-bullies, whereas victims of bullying tend to show more affective empathy than non-victims. Looking further into the bully and victim subsamples, results of previous research suggest that the frequency of bullying might be associated negatively with affective and cognitive empathy and defending might be positively associated with both types of empathy (Noorden et al., 2015).

As discussed above, it is understood that greater empathy it is possible to correlate with prosocial behaviour and social competence across the lifespan where children and adults are more likely to share, care and help others. In early childhood, poor relationships with peers, hostility and bullying can be associated with low empathy. This evolves in adolescence where this low empathy presents itself in slightly different behaviours, including aggression and antisocial manifestations. In later life, as the child turns to an adult, the low empathy-related responses are likely to include child abuse, psychopathy and violence (Nickerson et al., 2008).

Recent findings in Education have noted that bullying might be negatively associated with cognitive and affective empathy (Noorden et al., 2015). Noorden et al. (2015) found that bullies might not experience what others feel whether or not they understand what others feel. As a result, they suggest that training is necessary to enhance empathic skills since it is possible not only to reduce bullying but also to increase defending, which is associated with high levels of cognitive and affective empathy.

A study completed with 105 middle school students attempted to determine what impact attachment, gender and empathy had on their behaviour and moral decision making (Nickerson et al., 2008). The research concluded that their attachment and empathy in combination predicted their role in bullying, and that empathy had unique variance to the model even after accounting for all variables. More empathic children were more likely to state they would intervene to try and help a victim of bullying. This shows that the feelings of security and empathy may function together in promoting caring behaviour towards vulnerable persons.

As a result of the research completed into bullying and the association with empathy, the suggestion has been made that there should be open discussions with students about their roles in bullying interactions. Finding methods to teach school children empathy towards others is critical in bullying prevention programs. Research suggests that existing moral education programs should be examined and that new ways should be found to enhance empathy and reduce aggression by including an attachment theoretical approach. Training teachers to develop a supportive and secure emotional environment and community for children, and introducing new technologies to subtly help children identify and understand the emotions of others, might increase their empathy and moral understanding as a result (Stern & Cassidy, 2017).

A crucial part of creating an empathic connection is being able to see from another person's perspective. Previous studies noted that Storytelling, in its many forms, can be an incredibly powerful tool for gaining new perspectives and creating shared understanding. Stories can have both a cognitive (relating to the structure of the narrative) or emotional impact to us (relating to the content of the narrative which can evoke empathy and the sense of identification with the characters) (Oatley K., 1994).

Storytelling

Storytelling is a way to help children learn and develop cognitive skills as a parent, friend, teacher or sibling either reads a book or orates a story. Through Storytelling, at its most basic stage, is how we learn lessons that teach right and wrong. However, Storytelling is a skill, and in some cultures, a unique one passed down from an elder to the next generation.

However, as technology continues to develop, technologies add new ways to carry out and respect the tradition of Storytelling.

Cultivating empathy and reducing bullying through Storytelling

Several studies have focused on creating new storytelling methods that enhance empathy skills. Previous studies have pinpointed that stories, in many forms, have either a cognitive or emotional impact or both. They evoke empathy and the ability to identify with the characters in a story (Oatley K., 1994). When tied to bullying, students see the impact of how that type of negative behaviour comes to life.

In fact, many bullying prevention programs already use Storytelling and narratives to effectively promote empathy (Skaraas, S., 2018; Manney P., 2008). Previous studies pinpointed that Storytelling can act as an incredibly powerful tool for gaining new perspectives and creating a shared understanding. Those cognitive and emotional impacts either enhance existing empathy or start the process of helping others better identify with situations they have yet to encounter, or if they have, to change the negative behaviour.

Digital Storytelling

Digital Storytelling has emerged as a useful teaching and learning tool; it combines narration, images, sounds, videos, computer-generated texts and graphics to create emotional representations to the audience (Matthews, J., 2014; Robin, B., 2006; Robin, Bernard R., 2016).

Previous studies demonstrated that digital stories operate as a situational, emotional and intellectual carrier by communicating someone else's thoughts and feelings, and then, transmitting them to the intended recipients (Fokides, 2017).

Storytelling offers a learning context (Kapp, 2012) that schools may continually build upon to incorporate changes to technology. When adding interactive and technological elements that students relate to, they gain the ability to understand how they learn and how to transfer that into everyday situations (Hodhod, R. et al., 2011).

Therefore, to foster the different forms of empathy, and to help reduce incidents of bullying, looking at recent findings support the importance of interactive digital Storytelling in classrooms. This method triggers the students' imagination and curiosity. The interactive nature enhances the storytelling process and creates an environment that reaches more students by keeping them engaged (Hodhod, R. et al., 2011).

However, teachers need to make the distinction that interactive digital Storytelling in the classroom is not a form of entertainment, but an educational tool (Rizvic, S., Boskovic, D., Okanovic, V. et al., 2019). Making that distinction will help educators focus on presenting another way of learning to help make the classroom a more inclusive environment.

Interactive Storytelling also encompasses the use of augmented reality books. In this medium, augmented reality sparks student to use more of their senses. However, this is not a form of virtual reality, which puts users into simulations. Augmented reality books may use real-life bullying incidents.

While some students learn by reading, others are visual learners. This method bridges a gap between these different learning preferences. Additionally, when the story uses sound and other digital effects, teachers reach another demographic of students, the audio learners. Those students also may focus on the thoughts of children who participate in bullying (Δασκαλάκης Ιωάννης, 2018).

Virtual Reality and Sense of Presence

This brings us to virtual reality, which if used as a learning tool, and not as a form of entertainment, it seems to have important teachable moments too. Previous studies underline that VR technology has the ability to operate as an empathy machine. *"The term empathy machines refers to any attempt to make sensible to oneself the emotional experience of another via technology, intending to inhabit another body"* (Bollmer, 2017). It enables individuals to start to understand and appreciate the differences in one another (Shin D., 2018; Schutte, N. S., & Stilinović, E. J., 2017).

While the story may not be real, it can still allow children to feel present as the story unfolds, and they still use more of their senses (Archer, Finger, 2018; Shin, 2018) because VR creates a sensation of having an experience within the context of the presented narrative. It can still controls the brain's neuron system, allowing students to believe the lesson in a story while their bodies feel like they personally had the experience. (Shin D., 2018; Schutte, N. S., & Stilinović, E. J., 2017).

The sense of presence is a fundamental principle which must be considered when beginning to develop storytelling technologies or any media in which an immersive virtual environment is created. Presence – defined as the individual user's feeling of being 'there', or their immersion in an environment or scene which a medium created.

As a result, presence has remained one of the most important quality metrics to enable evaluation of the user experience. Researchers also agree that presence remains crucially important in the development and optimisation stages (Freeman & Avons, 2000).

The sense of presence, or sense of being in a created environment, is largely influenced by the content of the mediated world. It may allow the user's imagination to combine with the reality of what they experience, resulting in a truly immersive experience.

Action, perception and the body are the suggested three aspects of presence (Riva et al., 2014). To have the ability to interact and have a true sense of presence, a user must involve their body. These embodied experiences help convince the user that an action actually took place. In turn, this will lead to a stronger sense of presence and a more powerful emotional reaction.

It becomes logical that a strong connection might exist between empathy and the degree of sense of presence. The feelings, thoughts and users' emotions that evolve from the imagined environment and scenario come from the ability to use imagination, which in turn, might help the users project themselves into an environment that allow them to understand the experiences of other individuals

involved in the scenario. In theory, increasing the user's sense of presence should boost the user's empathy for a given situation. Because when a user truly embraces empathy, along with the sense of presence, they might create a bond. That can act as permission or elicit an emotional response, which tells the user to share the feelings and emotions of the characters in the story. When the user feels a strong mediated presence, they react not only bodily but also emotionally (Riva et al., 2014). That implies that the degree of presence is associated with the general trait of empathy (Nicovich et al., 2005). Empathy and sense of presence may have common features. These features consist of thoughts and feelings, which are being evoked by the imagined experience and projection of the self into an environment of the experience of another person. "The illusion of being present is the key ingredient that gives interactive media the power to affect people profoundly, to change them" (Riva et al., 2014).

Generally, there are two sets of variables which determine an individual's sense of presence: the characteristics of the media and the characteristics of the user. Characteristics of the media are generally physical properties of the display medium. They can include the extent of sensory information which is presented to the user, the control the user has over the position of their senses in the created environment and the modification ability that the user has. Media characteristics also relate to the overall story, the theme and the narrative created and displayed via the system. User characteristics such as their personal traits and their cognitive and motor skills can impact on the development of a sense of presence. Also, the age and sex of the user can cause variation along with the mood the individual user is in at the time of engagement. (Slater et al., 1998). Users who have visual primary representation systems are more likely to show a stronger sense of presence in a virtual environment that is created visually than users who have auditory or kinaesthetic primary representation systems.

The ITC-Sense of Presence Inventory was a questionnaire developed after an assessment of the research into various aspects of the sense of presence and self-report measures. It aimed to concentrate on the individual users' experience of the media (Lessiter et al., 2001). This questionnaire involved the users self-rating on 44 items which aimed to understand how involved the users felt when experiencing different media. Answers were given using a 5 point Likert scale and questions involved how engaged (involved in content) the user was, how spatially present (physically located in the virtual environment) the user felt, how valid the ecology was (how natural the environment appeared to be) and if the use experienced any negative effects (dizziness,

uncomfortable noises etc.). The ITC-Sense of Presence Inventory demonstrates an example of a tool by which the four key characteristics of the user experience and sense of presence can be examined.

Because virtual technology narratives have yet to progress in the classroom, the current study focused on creating a new type of empathy machine, used as a narrative mediation tool, which attempts to activate the user's embodied experience in the mediated world. By encouraging children to empathise with fictional characters, we aim at developing their empathic skills and ability to empathise with people in real life.

Wearable Interfaces - E-Textiles in 21st century

E-textiles – The use of fabric artefacts in everyday life

A well-known and advantageous innovative technological construction is that of wearable technology. Wearable technology is opening up whole new worlds by offering new possibilities not only for well-being but also for learning (Sapargaliyev, D., 2015; Luis-Ferreira, F. et al., 2017). Various types of wearables such as smartwatches, glasses, gloves and clothing have been invented to make our everyday life more comfortable and more productive.

In recent years a new type of wearable technology, known as wearable e-textile technology, has emerged. E-textiles are "fabric artefacts that include embedded computers and other electronics" (Peppler, 2016).   The research in the field of wearable e-textiles has been of great importance. E-textiles have been used in different domains and have offered new opportunities. Dance costumes have turned into music improvisation machines by just adding on them a microcontroller, a wireless transmitter and various sensors that recognize the movements of the dancer and then send the data to a laptop in order to convert those movements to sound (Lindsay, 2013).

E-textiles have also been used for the development of a workout buddy that keeps track of the user's exercise repetitions. The specific wearable workout buddy is a knitted armband enhanced with a circular sensor and wireless transmitter that detects whether its user's arm is straight or bent. The wearable workout buddy sends via Bluetooth the activity data to an application running on an android phone (Kaufmann, B., & Buechley, L., 2010).

Figure 1. The Armband Right: The workout interface Images from Kaufmann, B., & Buechley, L research (2010).

Also, in 2010 a fashion collection was created to promote science and technology learning by enhancing fashion designs with LEDs. In this fashion collection, known as the Fairytale Fashion, the designer Diana Eng, has used LEDs in order to create "magical" clothing that functions in real life. She aimed with her fashion collection to bring to life imagining worlds by using deployable structures (http://www.fairytalefashion.org). *"The resulting e-textile designs employ various combinations of motion-controlled electroluminescent (EL) wire, moving biomimetic deployable structures, audio-controlled twinkling, and inflation"* (Peppler, 2016). As the wearer walks the LEDs light up as a reaction to their movement or to sound, especially to the wearer's voice.

Figure 2. Fairytale Fashion collection by Diana Eng 2010. Images from http://www.fairytalefashion.org/ .

E-textiles – The use of fabric artefacts for learning

There is a growing body of literature recognising that the rise of wearable technology has given a considerable boost to the solutions for education and improvement of classroom experiences (Sapargaliyev, D., 2015). Findings have revealed that wearable technologies have the potential to engage students in learning, enable teachers to monitor activity and behaviour in the classroom, as well as to enhance experiences (Sapargaliyev, D., 2015; Borthwick, A. C., 2015; Norooz, L.et al, 2015).

It is of great interest the fact that nowadays e-textiles can operate as a wearable machine that improves and facilitates the learning experience. Previous studies suggest that use of wearable e-textiles in the classroom can concretize abstract concepts (such as human anatomy, circuits), create new types of learning activities (Peppler & Glosson, 2013; Norooz, L. et al., 2015; Kafai et al., 2014) promote the computational thinking (Kafai et al., 2014) and improve the learning outcomes.

In Education, e-textiles have been used mainly with the form of e-textile toolkits by allowing students to use their creativity to design their own artefacts (Kazemitabaar, M. et al., 2016; Kafai, Y., Fields, D., & Searle, K., 2014; Peppler, K., & Glosson, D., 2013, Norooz, L., et al. 2015; Tofel-Grehl, C et al., 2017). Some of the novice-friendly toolkits that have been used in computer education are the LilyPad Arduino (http://lilypadarduino.org), Fabrikit (www.fabrick.it) and Aniomagic (www.aniomagic.com). LilyPad Arduino has been used in a variety of projects such as a fabric harp and interactive dance costume (Peppler, 2013).

E-textiles have also been used in Science lessons as a useful resource in teaching circuits. The research pinpointed that the use of e-textiles had not only promoted participation in the classroom but also had made the concept of circuitry more transparent and consequently understandable to students (Kafai & Peppler, 2014). Kafai & Peppler used in their research the Lilypad Arduino kit. Students and teachers created their own e-textile designs by connecting LEDs with conductive thread on bags, shirts, hats, bracelets and gloves. Some examples of the usage of the wearable e-textiles in education are being explained.

Figure 3. E-textile conference bag. Images from completed projects of Kafai & Peppler (2014) research.

Kafai, Fields & Searle (2014) also used the Lilypad Arduino kit to examine students' experiences in designing and creating their own e-textile projects. The following examples are drawn from e-textile workshops the students attended (Kafai, Fields & Searle, 2014).

A student created a Skellington patch with light-up eyes to decorate a backpack (fig. 4). Other interesting inventions were the tote bag with light-sensing handles (fig. 5), the anime-inspired hat (fig. 6), the wearable belt with a double-helix DNA (fig. 7) and the felt flower that "will forever bloom" was invented by a girl in order to give it as a present for Mother's day (fig. 8).

Figure 5. Skellington patch with light up eyes to decorate a backpack. Images from completed projects of Kafai, Fields & Searle (2014) research.

Figure 4. Tote bag with light sensing handles. Images from completed projects of Kafai, Fields & Searle (2014) research.

Figure 6. Anime-inspired hat. Images from completed projects of Kafai, Fields & Searle (2014) research.
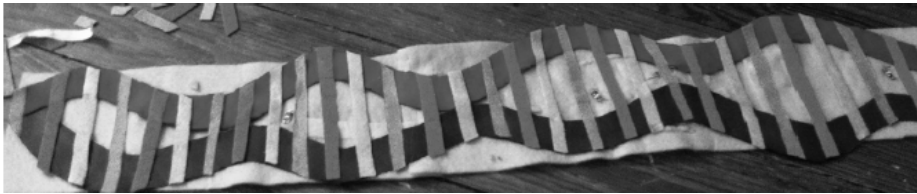

Figure 7. Wearable belt with a double-helix DNA. Images from completed projects of Kafai, Fields & Searle (2014) research.

Figure 8. Felt flower. Images from completed projects of Kafai, Fields & Searle (2014) research.

Nugent, G. et al. (2015) examined the possibilities of using the wearable e-textiles in promoting STEM learning and attitudes. The study was focused not only on students but also on teachers. The structure of the students' workshops followed the curriculum that was developed based on the research purpose. In the final workshop, students used a standalone LilyPad Arduino microcontroller, LEDs, buzzers and sensors to design and create a t-shirt. Teachers attended a one-day professional development workshop which consisted of the curriculum overview, engineering design process presentation, and hands-on activities to create a flag/pennant that incorporated wearable technology component. The main purpose of the professional development workshop was to examine the development of teachers' confidence in delivering wearable technologies curriculum. The results suggest that the use of e-textiles in the classroom can promote participation in computing and STEM. Also, findings show that after training teachers can develop confidence in delivering the wearable technologies curriculum.

Another study investigated the types of interactive wearable behaviours children want to design. Children designed prototypes by using three different digital-physical kits a robotics kit called Cubelets, an electronics kit called Logiblocs, and ReWear (Kazemitabaar, M., et al., 2016). The ReWear kit offers a wide range of possibilities for e-textile creations. By using the ReWear children can create a bracelet that plays different tones depending on arm position (fig. 9), a 'chameleon' shirt that changes colour based on surroundings (fig. 10), a hat that changes colour based on ambient light levels (fig. 11), a hat that flashes with movement (fig. 12),
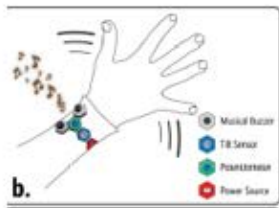

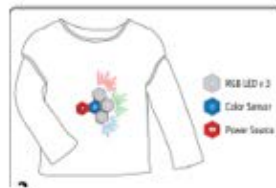Figure 9. Bracelet. Possibilities for creation with the use of ReWear kit.

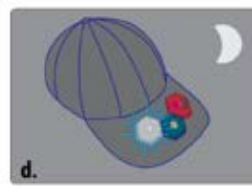Figure 10. Chameleon shirt. Possibilities for creation with the use of ReWear kit.

Figure 11. Hat that flashes with movement. Possibilities for creation with the use of ReWear kit.
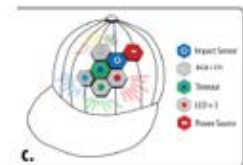
Figure 12. Hat that flashes with movement. Possibilities for creation with the use of ReWear kit.

Findings show that ReWear was the most attractive kit since it was "wearable, simple but versatile, and easy to reconfigure". They also noted that they liked the possibility of developing more than one designs. Children used their imagination and developed their own e-textile creations.

Ontario Education has also attempted to incorporate e-textiles into schools (Hughes, J., & Morrison, L., 2018). The first pilot project was launched in 2015. The participants were 11, and 12 years old students with cognitive, behavioural, emotional and developmental difficulties and the primary purpose of the project was the students to practice following instruction skills for them to integrate into the community or community schools effectively. At the beginning of the project, students were told that they were going to make bookmarks. Students were struggling with reading; hence they did not find the idea of the project interesting. Also, students' reactions during the project revealed that sewing was the most difficult and their "least favourite" part of the project. The findings underline the fact that the final product of the project did not attract students' interest, because, for them, it was without purpose. As a result, students could not manage to maintain their focus and persistence during the creative process. The study revealed that it is of great importance participants to find their own purpose or be identified with the purpose of creation.

In 2015 a second pilot project took place during a week-long March break camp. Participants were from lower-achieving schools, and this time three of the five participants were identified with special needs. During the camp, students practised their digital skills and were introduced to the creation of tangible and digital products, by participating in activities with Scratch, Makey - Makey, Arduinos, LilyPad kits. At the beginning of the project, students had the opportunity to understand how a circuit works, by playing a role kinaesthetic game, where students had the role of electrons. The embodied learning played a significant role not only in their understanding of circuitry but also in the conceptual understanding of sewing for creating e-textile circuits. However, the process of sewing was difficult for this group. Some students of this group could not stay focused on the task, because they had already sewed their textile and put effort on their project and finally realised that their product was not working properly, so they had to check and change their sewing.4&5)

Overall, the findings of the study underline that three are the essential elements that promote engagement in the creation of e-textile products. The first one is the freedom of choice. When students have the opportunity to choose what they will create, they not only find the making process more interesting but also the product is adapted to their previous knowledge and their level of ability (coding, sewing, design etc.).

 The second element is collaboration during the making process. Collaboration appears to make students more engaged, since by collaborating they learn from each other, while at the same time teach

each other. Students feel that they work effectively, they control their learning, and their knowledge is useful and important during the project.

The third element is making for purpose. Students that are identified with the purpose of the creating process are more possible to maintain focus and be engaged during the making process.

Last but not least, "just in time support", encouraging students to learn from their mistakes and incorporating embodied and kinaesthetic learning activities can contribute to better conceptual understanding and student engagement.

The research that has been contacted in the field of e-textiles in education has mainly focused on how students can develop their own e-textiles to learn about science, engineering, arts and crafts (Peppler & Danish, 2013). However, teachers can also develop e-textile products in order to effectively engage students in 21st-century lessons and achieve more effective learning. Peppler and Danish (2013) used in their study the LilyPad Arduino to create e-puppets in order to help students explore ideas about how the honeybees communicate and collect nectar.
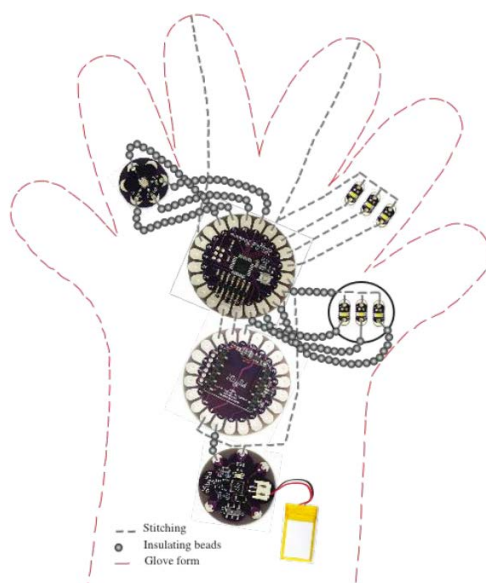
Figure 13. Bee glove Layout. Picture from Peppler, Danish, Zaitlen, Glosson, Jacobs, Phelps, 2010.

The activity, named "BeeSim", consists of computationally enhanced bee puppets, flowers and hives. The bee puppets are enhanced with an array of LEDs that light up to show the amount of nectar they find in the computationally enhanced flowers. Each child may only once collect nectar from the same flower. When the stomach of the bee has been filled, the whole array of LEDs lights up, and the bees need to go back to the hive and deposit the nectar that they've collected. If they run out of time, the nectar they have collected is lost.

Figure 14. Users using the Bee puppets to collect the nectar from the flowers and deposit at the BeeHive. Picture from Peppler, Danish, Zaitlen, Glosson, Jacobs, Phelps, 2010.

The research in the field of e-textiles in education has mainly focused on how students can develop their own e-textiles to learn about science, engineering, arts and crafts (Peppler & Danish, 2013). However, literature shows that teachers can also develop e-textile products in order to effectively engage students in 21st-century lessons and achieve more effective teaching. Peppler and Danish (2013) used the LilyPad Arduino to create e-puppets in order to help students explore ideas about how the honeybees communicate and collect nectar. In their study, students participated actively in an activity called "BeeSim". In that activity, students were transformed into bees, by just using a computationally enhanced bee puppet. The activity consists of computationally enhanced bee puppets, flowers and hives. The bee puppets are enhanced with an array of LEDs that light up to show the amount of nectar they find in the computationally enhanced flowers. Each child may collect nectar only once from the same flower. When the stomach of the bee has been filled, the whole array of LEDs lights up, the bee needs to go back to the hive and deposit the nectar that it has collected, and a new kid takes the role of the honeybee. If players run out of time, the nectar they have collected is lost.

In Education, e-textiles have been used mainly with the form of e-textile toolkits by allowing students to use their creativity in order for them to design their own artefacts (Kazemitabaar, M, et al., 2016; Kafai, Y., Fields, D., & Searle, K., 2014; Peppler, K., & Glosson, D., 2013, Norooz, L., et al. 2015), but not much research has been done on how teachers can use the e-textile artefacts in the classroom.

Reasons to use a wearable e-textile to enhance Empathy

Storytelling and theatre performances use costumes as an essential part of the experience. It visually connects viewers to the verbal aspect of the story. It communicates messages to the audience and enables them to develop a better understanding of the characters and their situations (Maclaurin & Monks, 2015). Furthermore, costumes play an essential role in performance as it tells the audience about the setting, conveys social messages, creates a desirable atmosphere (Bicât, 2006) and the first impression. Because of this, it limits the need for wordy introductions (Ingham, & Covey, 1992).

Based on those factors, we assume that using wearable e-textiles, fabric artefacts which act as costumes, we will be able to elicit the same types of feelings created by images used in the theatre and other mediums that rely on visual factors like movies, another storytelling device. E-textiles might have the ability to operate as a narrative mediation tool. They might communicate the mediated world and the characters' feelings to the audience.

Shapes and colours on e-textiles might stimulate curiosity and attract attention, a critical element to supporting narrative understanding. The chosen shapes and colours provide character insight and intentionally send cues for the audience to partake in understanding the perspectives of different characters, along with the embodied experiences the audience develops.

Additionally, previous research revealed that colours, like facial expressions, link to emotions (Da Pos, O., & Green-Armytage, P., 2007). Colours affect parts of the nervous system, which stimulate emotions (Humphrey, 1976). This was termed Colour Emotion (Zammitto, 2005) because of the link to emotions and sometimes a person's social status. By examining the history of colours, we see how they link to responses from the nervous system (Zammitto, 2005).

As one example, purple has the distinction of being worn in certain monarchies only by royalty. This also denotes a social status of wealth because of the high cost of dying fabric that colour. By looking at the colour purple and what it represents, we see how colours may become a factor in bullying. Children that experience wealth through their families, compared to children who grow up in lower-income households, have vastly different experiences.

To further stress the point of colour, blue and red provide good contrast. Blue has associations with calmness and stability.

Furthermore, red may indicate anger because people associated it with blood and fire. Red light may increase heart rate, brain activity and skin responses (Zammitto, 2005). For that reason, we suggest that the use of different colours on e-textiles. The chosen colours link to important concepts that directly correlate to bullying. The aim is to elicit emotions like fear, emotional pain, stress and sadness. However, when a story has a positive resolution, it can also bring joy. By using a variety of colours, students then link them to the narrative, and they begin to understand the perspectives of the characters. Without analysing if specific colours have a different meaning, we see how initial judgements form.

The light, the colours and the sound will take the user to the story's space and time. We assume that the combination of visual and oral narratives will contribute to the creation of mental images and enhance the user's mental representations of the story. All the stimuli will give the opportunity to users to watch the story unfolding in front of them and feel part of the story. The visual representations on the t-shirt that the user can see in the mirror, will give emotional content and interaction to the narrative and they will increase the user's involvement (Bower & Sturman, 2015).

Pantouvaki (2014) notes that the way the tangible technology interacts with the user and their environment is remarkable. The tangible technology user becomes a meaningful, situational, emotional and intellectual carrier in an innovative and interactive way. In tangible technology, the body becomes an emotional object that focuses on human experience beyond the conventional styles of expression. Embodied experiences create the sensation of personally having the experience. In addition to the embodiment, people can understand and empathise more when they comprehend another person's subjective experience and environment.

The Study - Wearable E-textile as a Narrative Mediation tool to enhance Empathy in the Classroom

Reasons behind the research

As mentioned above, one of the most important aspects of education is the moral education of pupils, which is primarily based on the cultivation of empathy. Bullying is perceived to be an important moral issue the school has to prevent or to deal with. Education has made reasonable efforts to confront this problem by aiming to promote the cultivation of empathy in students. Nonetheless, recent evidence suggest that subtler methods of instruction would be more effective for the cultivation of empathy at school. Also, previous studies have underlined that Storytelling can evoke empathy and the sense of identification with the characters, as well as the fact that the sense of being present in the story can enhance the effectiveness of Storytelling. This has led me to the creation of an innovative narrative mediation tool. The specific tool wants to make good use of body and senses (visual and auditory), in a smart and fun way to help students to create the suitable mental representations, which in turn will conduce to the promotion of empathy.

More specifically, the current research aims at exploring ways in which the wearable could mediate the narration. Based on the previous' research findings (Palaigeorgiou, G., Vroikou, G., Charoumenou, N. & Bratistis, T., 2019) and narrative techniques, I came up with seven basic interactions (visual mediation types). The use of specific narrative interactions aims to enhance the function of the e-textile as a narrative mediator. A digital dictionary composed by those interactions aims at the development of a more systematic way for the use of the wearable e-textile as a narrative mediator.

The suggested interactions (visual mediation types) to be considered in this research for the use of the e-textile as a narrative mediation tool are the following:

Symbolic Metaphor. This interaction refers to the presentation of the pattern as a metaphor. The pattern functions as a symbol that conveys meanings and concepts that cannot be literally depicted. Such concepts can be the concept of joy, aggression, fear.

Symbolic Representation. This interaction uses the pattern in a symbolic way, in order for the user to create representations for specific concepts. Such concepts may be the depiction of different characters (different patterns represent different characters of the story).

Embodied Representation. This interaction has been chosen to represent concepts of the narrative associated with responses on the user's body. The pattern appearing on the user's body seems to have effects on it. Concepts that can be included in Embodied Representations are that of the neck chain, as well as blood circulation.

Intensity. The specific interactions are intended to give emotional intensity to particular parts of the narrative. Patterns repeated for a certain period, and those accompanied by bright colours could be included in this category. Their continuous presentation, in combination with their bright colour, cause visual intensity, which in turn aims at creating emotional intensity to the user.

Role Change- Costume. The interactions in this category aim at signalling the alteration of the characters involved in the narrative. The e-textile works as a costume for the character mentioned in the story.

Narrative Gap. The interaction of the narrative gap takes place with the absence of light. The role of this interaction allows the narration and sound effects to give a glimpse of the story's space and time.

Foreshadowing. This interaction aims at preparing the user for what is going to happen in the narrative. More specifically, the patterns appear on the e-textile, as well as the sound effects precede the narrative continuity, aiming to provide evidence for the following story events.

The wearable interface (E-Textile)

For the creation of the e-textile, the researcher used a black jumper for 10-11 years old children, so all the participants will fit in it. Also, it is of great importance the jumper to be made with 100% rigid cotton fabric, so it is not elastic. The absence of elasticity is necessary when electronic parts are put on a textile. More specifically, the wearable interface consists of the following parts:

- A jumper made with 100% rigid cotton fabric.

- 3 Adafruit NeoPixel Digital RGB LED Strips

- 6 smaller Adafruit NeoPixel Digital RGB LED Strips to create a LED matrix screen

- A microcontroller Arduino Mega board

- Jumper wires

- A USB power bank

A LED matrix screen covers the jumper and Adafruit NeoPixel Digital RGB LED an Arduino Mega board controls the strips. A power bank is used as the external power supply, in order for users to move more natural parts of their body.

More specifically, the LED strips, as well as the LED matrix screen and the Arduino Mega board are attached to the wearable with the use of VELCRO stick-on tape. To get them to adhere well to the jumper, I appliqued the one part of the sticky side of the Velcro on the jumper and the other part of the sticky side on the LED strip.

Figure 15. The wearable e-textile. LED strips and LED matrix screen.

Also, the Arduino is placed at the backside of the jumper.

The e-textile can represent a variety of shapes and colours independently or in combination in different sequence and frequency.

Figure 16. The Wearable e-textile, backside.

The proposed environment

In the proposed approach, the participant wore the e-textile and stood opposite of a mirror to watch their own body as the illuminations transformed it. The narrative screen was the participant's own body which mediated the oral narrations.

Essential elements of e-textile's narrative function were the way, the sequence, and the frequency of activating the LEDs, the shapes as well as the colours appeared on the e-textile. Those elements were used to create the seven interactions of the wearable. Before the narrative started, the lights in the room had been switched off to create a dark environment. The dark environment provoked a more dramatic impact of both the activation of the LEDs and their non-activation.

The audible (Storytelling) and the visual stimuli on their body (matrix, led strips) aimed to make users feel that they are living the experience. Visual stimuli could predispose what will happen, explain what happened, convey the feelings of the characters, the intensity of their emotions or their absence, the transformation of emotions, who is the narrator, etc.

With tangible technologies, the body becomes an emotional object that focuses on human experience beyond the conventional styles of expression. The narrative also will guide the participant towards to story's succession, either visually (a tree flashes on the e-textile, so they expect action from the tree) or audibly ("He doesn't speak out", when a chain flashes on the e-textile close to the user's neck). As a result, the user experiences, interprets and interacts with the events of the story through an additional modality. There are also second person instructions which guide the participant to act (e.g. "Put your hands in your heart …"), to experience the story, to acknowledge the problem and its solution.

The Narrative

Description of the story

The idea of the narrative exploited was based on European Daphne III campaign "Awareness raising and prevention on bullying among students: development and implementation of a school-based training program for teachers» ". The specific program aimed to prevent bullying "by developing and implementing a preventive tool that increases the awareness of primary school teachers". However, the story "Orpheus runs -Thoughts of an Old Tree" has been tailored to the goals and needs of the particular physical construction and a new story, based on the previous one, was created. The new story "Facing my biggest fear", was written by the researcher. Also, the narrative was used to create the audio story. For the creation of the audio story, the researcher followed the steps: recording speech, editing speech, and editing sound effects.

The main character of the story is a young student named Marinos, who is being bullied by a group of children at school. The story takes place at the school playground. The second main character of the story is that of a wise old tree. The wise old tree plays the role of the narrator. It is an outside observer that because of its nature, its voice cannot be heard. The role of bullies is also of great importance since they are the source of Marinos emotional pain. At the beginning of the story, Marinos is being described as a weak child with no close friends. For him, break time becomes a "nightmare", since he feels unsafe in the school playground. Two bullying incidents are being described in the story. The first bullying incident happens when the bullies find him playing football with a friend. His peers are verbally and physically attacking Marinos, and his friend abandons him, without taking any action to help him because he is also scared of them. The second incident retakes place at the school playground. This time Marinos hides behind the old tree. This is the only place he feels safe. They rarely go there, but suddenly they appear in front of him, and they start making fun of him again.

At that moment, the voice of the tree describes Marinos' emotions, feelings and thoughts, so the users become aware of Marinos' innate world. The tree also expresses its own thoughts. Even though it knows that Marinos cannot listen to its voice, it insists on saying how strong Marinos' is and bringing into the surface his strengths. By underlining his strengths, the tree attempts to awake Marinos and

make him raise his voice against the bullies in front of his classmates. Eventually, Marinos decides to stand for himself. He is not scared of them anymore. An unexplained innate power made him realise that he is not that weak, and he should face his biggest fear. After Marinos spoke out against the bullies, they realise that their behaviour was not appropriate. They not only regret their past behaviour but also become friends with Marinos, and they create an anti-bullying school group that aims to face bullying incidents in their school.

The story was written and recorded in Greek. You can find the story in the Appendix section.

Narrative Techniques in the Story

As regards the narrative discourse, there is a third-person narrator that takes part in the story. The wise old tree acts as a self-aware narrator, either as an observer or as an eyewitness of Marinos' experience. He is an omniscient narrator, who knows and conveys past and present events to the listener and the feelings of the characters. Both the use of present tenses and the tree's inability to help the protagonist, contribute to the creation of the dramatic aspect of the story and have a profound emotional effect on the listener, by inducing mental images on him. His voice cannot be heard, because of its nature (he is a tree). Sometimes though his silent voice can be heard from the protagonist.

At the beginning of the story, the narration unfolds in a descriptive way, with a third-person point of view. The narration begins in media res and not ab'ovo, since the story starts by unfolding the happy end of the story. This technique is being used to attract the listener's attention. The story consists of the five following chapters: 1. Future, 2. Marinos from tree's perspective, 3. Marinos' confession, 4. Marinos' innate world, 5. The attack against Marinos, 6. Marinos speaks out for the first time, 7. The bully.

Of vital importance, it is also the use of dialogues in the story, since it provides realism, depicts characters and the way they relate to each other.

In the story, the narrator continues by talking in a second person ("Don't listen to them", "I am proud of you", etc.). Particularly, dramatic questions accompany the second person narration (e.g. "What do you say?" Don't you think that he finally needs to speak out?"). This does not only gives emotional content (e.g. "Do you feel his pain?") but also brings the listener into action. It is an attempt to transform the user into the protagonist (according to the technique "Choose your own adventure").
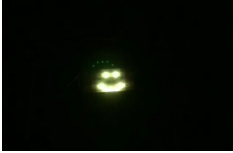
Moreover, the current study aims to create an interaction between the duration of the story and the duration of the discourse, by making good use of the time modifications: narrative acceleration, deceleration and ellipsis.

The wearable e-textile aims to operate both as a complementary mediator that enhances the expressiveness and the graphic language of the narrative, as well as a meaningful, situational, emotional and intellectual carrier.
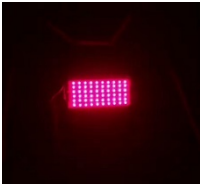
The narrative use of Visuals – The Dictionary

The visual representations, as well as their role in the narration, are being addressed in the following table. This table operating as a dictionary connects each visual pattern to corresponding meanings and story concepts, as well as, it explains its role in the narration. As it is evident in the dictionary, the visuals play different roles in the narration (Symbolic Metaphor, Symbolic Representation, Embodied Representation, Intensity, Role Change- Costume, Narrative Gap).
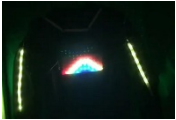
VISUALS	CORRESPONDING CONCEPTS AND MEANINGS	VISUAL MEDIATION TYPES CORRESPONDING ROLE IN THE NARRATION
Flashing heart	He is running to hide, unbearable pain, heartbeats, his heart is in pain because of his sadness	**FORESHADOWING** Preparing the audience for the feeling of fear Marinos experiences every time the school bell rings for break **SYMBOLIC METAPHOR** Invites participants to get their hands on that place **SYMBOLIC REPRESENTATION** Heartbeat
Right arrow	He is looking to the right	**INTENSITY** Invites the user to look to the right and take Marinos' perspective by participating bodily (embodied learning)
Left arrow	He is looking to the left.	**INTENSITY** Invites the user to look to the right and take Marinos' perspective by participating bodily (embodied learning)
Blue rain	tears, scared	**SYMBOLIC METAPHOR** for tears **INTENSITY** Marinos is scared, and the flickering rain underlines the lack of determination which indicates weakness and fear.

Yellow smile	happiness (feels happiness)	**SYMBOLIC METAPHOR** It symbolises Marinos' urge to play and interact with his classmates. The yellow colour combined with the smiley face is associated with joy and excitement.
Constant yellow smile	Winner, do you feel the happiness?	**SYMBOLIC METAPHOR** It symbolises Marinos' appetite for game and interaction with his classmates. The yellow colour combined with the smiley face is associated with joy and excitement
Constant blue dot	Alone, tiny	**SYMBOLIC REPRESENTATION** The dot represents Marinos because he is always alone. It serves the narrative technique of "Antithesis" big-tiny. Big red vertical line for the bullies, because they are bigger and stronger and the small blue dot for tiny and weak Marinos. **SYMBOLIC METAPHOR** The colour represents Marinos' psychological state (weak, scared, no self-confidence)
Blue person	Marinos, he is one	**ROLE CHANGE- COSTUME** The participant is getting dressed in Marinos' "clothes". It accompanies the narration, while it reminds to the "reader" which character is speaking. **SYMBOLIC REPRESENTATION** The blue person appears on the e-textile every time Marinos' speaks. **SYMBOLIC METAPHOR** Blue colour communicates to the user the emotions of fear and sadness that Marinos experiences.
Two red people	bullies, they are many	**ROLE CHANGE- COSTUME** The participant is getting dressed with the bully "clothes". It accompanies the narration, while it reminds to the "reader" which character is speaking. **SYMBOLIC REPRESENTATION** Two red people appear every time bullies speak because they are two. **SYMBOLIC METAPHOR**

		The red colour is related to the aggressiveness and the power that bullies appear to have.
XA	Laughing and making fun of him	**INTENSITY** It flashes twice, so it creates the word XAXA. Bullies' laugh has not only been engraved in Marinos' head but also his body. The user takes the role of Marinos' since the laugh is being depicted on his body.
Red splash	mud, tight stomach	**ENVIRONMENT** It depicts the muddy place **SYMBOLIC METAPHOR** The red colour is related to Marinos' innate pain caused by the bullying incident. **SYMBOLIC REPRESENTATION** Tight stomach.
X on matrix screen and the strips on hands light-up red	It's because of my appearance!	**SYMBOLIC METAPHOR** The X symbolises the rejection of his outward appearance by his peers. It lights up on the chest, as this rejection brings innate pain, and for that reason, he fails to love and accept himself as it is. Also, the red colour is associated with pain. **INTENSITY** Red hands reinforce the sense of rejection, and in combination with the X, Marinos appears to be a bully target.
Absence of light	Loneliness, I feel so lonely, everything around me is dark.	**NARRATIVE GAP** At the beginning of the story, the absence of light allows the narration and sound effects to give a glimpse of the story's space and time. It stimulates the user's interest, and to make them guess who the narrator is, where the story takes place. The narrative gap is being used to enhance the narrative technique of "hook". Afterwards, it reinforces the sense of Marinos' experiencing a nightmare.

Flashing sad face	Sadness, upsetting feelings	**INTENSITY** It accompanies the narration of sad incidents **SYMBOLIC METAPHOR** It symbolises the emotion of sadness. It communicates to the user the emotion of sadness that was generated by the bullying incident. It also operates as an adjective that describes sadness. In the current situation, the adjective is being projected in the form of a sad face on the e-textile.
Red vertical line	They are big	**SYMBOLIC REPRESENTATION** Bullies are big. **SYMBOLIC METAPHOR** Red colour depicts bullies' innate world that is full of aggressiveness and power in contrast to the blue dot that represents Marinos' loneliness. It serves the narrative technique of antithesis big-tiny, a long vertical red line for the big and robust bullies but a tiny blue dot for the weak person that is being bullied.
Constant red on the matrix screen	strong, fearless	**SYMBOLIC METAPHOR** The constant red on the screen represents the determination and the power that bullies have. It serves the narrative technique of "antithesis" stiff – scared. Marinos' fear is presented with the picture of the flashing blue rain, which indicates weakness and fear.
Blue Strips on hands	Blood freezes	**EMBODIED REPRESENTATION** Blood appears in blue on the user's hands. Blue depicts the colour of ice and Marinos' sadness. The constant blue light on the strips and the absence of flashing represent the absence of blood flow in his body, due to emotion of fear. The innate fear is externalised "in user's body". **SYMBOLIC METAPHOR** Blue symbolises the fear and disruption of blood flow.

Constant red chain	He does not speak; he does not want to discuss it with anyone, the tree is not able to talk	**EMBODIED REPRESENTATION** The chain around the neck prevents Marinos from speaking out, as well as it underlines the tree's inability to speak to humans. **SYMBOLIC METAPHOR** The chain is as red as the pain it generates.
Breaking chain	When Marinos speaks out	**EMBODIED REPRESENTATION** It lights up in combination with a breaking chain sound effect **FORESHADOWING** It operates as a foreshadowing; it attracts the user's interest as well as it mystifies the user.
Red question mark	Follows a question	**NARRATIVE GAP** Invites the user to process and answer the questions mentally. The question mark also intensifies the dramatic aspect of the questions.
Tree	Every time the tree speaks	**SYMBOLIC REPRESENTATION** The first time it lights up, it unveils the narrator's identity. The not exact shape invites the user to guess about the narrator's identity, but this time there are more clues (green colour on the pattern). After a couple of seconds, the narrator's identity is unveiled audibly. **ROLE CHANGE- COSTUME** The user gets dressed in the costume of a tree.
Constant blue strips on hands in combination with blue on matrix screen	His body is numb and his blood freezes	**EMBODIED REPRESENTATION** Blood appears in blue on the user's hands. Blue depicts the colour of ice and Marinos' sadness. The constant blue light on the strips and the absence of flashing represent the absence of blood flow in his body, due to the emotion of fear he experiences. This time the innate fear is externalised more intensely "in the user's body" since the blood has been frozen even in the heart. **SYMBOLIC METAPHOR** Blue represents ice as well as sadness.

Owl	Every time the owl speaks	**ROLE CHANGE- COSTUME** The user gets dressed in the costume of an owl. **SYMBOLIC REPRESENTATION** The first time it lights up, it unveils the character's identity. The not exact shape invites the user to guess about the identity. After a couple of seconds, the identity is unveiled audibly.
Rainbow	Positive change that brings happiness	**SYMBOLIC METAPHOR** Bullying brought the rain in the sky. However, when bullies regret their behaviour, a rainbow appeared in the sky.
Flashing X	Scars	**EMBODIED REPRESENTATION** Innate scars are externalised in the body.
White strips- white smiley face	happiness, joy, purity, cleanness	**SYMBOLIC METAPHOR** Joy and cleanness of the soul. The "bully" regrets his past behaviour. The aggressive red transformed into the pure white.

Purpose of the study

The current study is focused on the creation of a narrative mediation tool that is able to take the user to the story's space-time by enhancing their sense of presence, as well as to operate as an empathy machine (put the user in someone else's shoes) by enabling them to feel the emotions of the narrative characters and understand their minds. More specifically, the current research has been designed based on the results of previous research (Palaigeorgiou, G., Vroikou, G., Charoumenou, N. & Bratistis, T., 2019) which had been contacted by students of UOWM for the exploration of the wearable e-textile use in Storytelling about bullying. The current research is focused on the creation of a "digital dictionary" for the effective use of the wearable e-textile as a narrative mediation tool. With the creation of the "digital dictionary", the study aims to find out mediation types that transform the wearable e-textile into a narrative mediation tool.

Aims of the study

This exploratory study investigates whether the use of wearable e-textile technology can be utilized in Storytelling as a narrative mediator that enhances empathy. We wanted to be able to put the user in

narrative characters' shoes, by presenting visual stimuli on their body, while they listen to a narrative about bullying. Visual stimuli on their body are accompanied with narrations, sounds or absence of sounds and light aiming to create a mediated environment that triggers students to feel and understand the emotions of the narrative characters.

The main goals of this explorative study are to investigate:

- Can the e-textile operate effectively as a narrative mediation tool?

- Can the darkroom and the use of the e-textile as a narrative mediation tool enhance the user's sense of presence in the narrative?

- Can the e-textile as a narrative mediation tool, contribute to the promotion of cognitive and affective empathy in students?

- Can the e-textile as a narrative mediation tool, contribute to the moral learning about bullying?

- Can each visual mediation type on the e-textile operate effectively in combination with the narrative?

We assume that the e-textile will operate effectively as a narrative mediator. More specifically, we assume that the wearable e-textile will help students to:

a) feel that they are part of the story they are listening to,

b) understand the story

c) understand and experience emotions about the characters of the story

We also assume that the darkness in the room in combination with the use of the e-textile will make the user feel that they are part of the story by taking the characters' perspective. As a result, it will trigger the user's feelings, and it will enable them to feel the emotions of the narrative characters (affective empathy) and understand their minds (cognitive empathy).

Moreover, we assume that the use of the e-textile will not only promote user's affective and cognitive empathy but also will contribute to the moral learning about bullying.

Last but not least, we assume that the visual mediation types of Symbolic Representation, Role change-costume, Symbolic Metaphor, Embodied Representations, Narrative Gap will influence user's experience, will contribute to the creation of mental images and enhance the user's mental representations of the story, will give emotional content and interaction to the narrative, and they will increase the user's sense of presence.

Methodology

Participants

In order to evaluate the proposed "empathy machine", 10 students (6 boys, 4 girls) of the Greek Community School at St Cyprian's in London, aged 11 (6 students) and 12 (4 students) watched and listened to the narrative. The participants were fluent in both Greek and English. Of the 10 participants, 7 stated that they had been bullied in the past, while they claimed that for them it is not possible at all to bully someone in the future. The rest of the participants claimed that had not been bullied in the past and that for them it is very little possible to bully someone in the future (2 of them) and not possible at all (1 of them).

Procedure

A convenience sample was used with the aim for the researcher to have easy access, as well as for the participants to be able to understand the story, which was written in Greek. The participants were students of the Greek Community School at St Cyprian's in London, where I work as a teacher, so it was easier for me to come in touch with the Head of the School, as well as with the parents.

In the first step, the researcher discussed with the Head of the School about the purpose of the study and the procedure that would be followed. Afterwards, an informed consent explaining the purpose of the study and the procedures to be involved in the research was given to parents of students who were both fluent in Greek and English. Participants and their parents/guardians had given their consent to participate in the research.

In the second step, the study took place at the Greek community school, in a classroom that is possible to have absolute darkness. Every session was contacted with the participation of just one student, the one who was wearing the e-textile. Each participant was first given brief instructions about what is going to happen, where they would be standing and what they were going to do. After that phase, they completed the first part of the questionnaire, where they had to state if they had faced a bullying incident in the past and what their reaction was. Also, they had to answer the question about the probability of them bullying someone in the future. During this phase, they also had the chance to familiarise themselves with the e-textile. They had a closer view of it, and I explained to them how it works. They were also informed that a doughnut would be given to them at the end of the session as a treat.

Afterwards, they wore the e-textile and the lights turned off. The participant was standing opposite of a mirror in order to watch his own body as it was transformed by the illuminations. The narrative screen was the "reader's" own body which mediated the oral narrations.

The mediated narration lasted for about 10 minutes. After participants experienced the mediated narration, they completed the questionnaire, and a short interview was conducted to identify the various perspectives of their experience. The average time taken to complete each questionnaire was 10 to 15 minutes. The average time allocated for each interview is estimated 8 to 12 minutes.

Questionnaire

As part of this study, I developed a questionnaire that seeks to measure e-textile value as a potential narrative mediation tool that enhances empathy since no other similar research has been done in the field. Specifically, the construction of the questionnaire aimed to establish students' evaluation of how important, how interesting and how useful the e-textile was, as well as to assess whether the e-textile as a narrative mediation tool in combination with the story, narration and darkness in the room was able to activate empathic responses and promote moral behaviour. The empathy question group was created based on the scales of the EQ (Zoll & Enz, 2010). Last but not least, the questionnaire also included a scale that assessed the effectiveness of the interactions (visual mediation types) used on the e-textile.

The questionnaire consisted of affirmative statements. All questions were answered using a five-point Likert scale, with five being the most positive score.

To measure this construct, fifteen Likert-type question groups were added onto the questionnaire:

- E-textile assessment,
- Darkness,
- Tiredness,
- The most important variables that attracted user's interest
- User's interest in the story's stages,
- Concentration
- Behaviour with bullying,
- Cognitive Empathy,
- Affective Empathy,
- Visual mediation types for Symbolic Representation,
- Visual mediation types for Role Change- Costume,
- Visual mediation types Intensity assessment,
- Visual mediation types for Symbolic Metaphor,

- Visual mediation types for Embodied Representation,
- Narrative Gap

Validity and reliability test

In this study, the reliability coefficient of each question group for the survey instrument was above 0.70, and it well exceeded the minimum criteria to demonstrate internal consistency. To measure cognitive and affective empathy, Likert type items were adapted from Zoll's and Enz's (2005) Empathy Questionnaire (EQ) and adjusted to the needs of the research. The items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted (see the Table). The Cronbach alpha for the variable "User's interest in the story's stages" was less than 0.70. Still, it was kept in the questionnaire since the information it gives concerns the level of interest in the different story's stages.

VARIABLE	QUESTIONS	Cronbach's (Alpha)
E-textile	2a, 2b, 2d, 2e, 2f	**0.763**
Darkness	14e, 14f	**0.792**
Tiredness	6a, 6b, 6c, 6d, 6e	**0.732**
Variables of interesting experience	4a, 4b, 4c, 4d, 4e, 4f, 4g	**0.709**
Users' interest in the story's stages	5a, 5b, 5c, 5d, 5e	**<0.70** **It is kept because we examined their interest in different stages**
Concentration	2c, 14c, 14g	**0.745**
Behaviour with bullying	7a, 7b, 7c, 7d	**0.808**
Cognitive Empathy	15a, 15b, 15c	**0.727**
Affective empathy	16a, 16b, 16c, 16d, 16e	**0.701**
Visual mediation types for Symbolic Representation	8a, 8b	**0.889**
Visual mediation types for Role Change-Costume	9a, 9b	**0.889**
Visual mediation types for Intensity	10a, 10b	**0.789**
Visual mediation types for Symbolic Metaphor	12a, 12b	**0.810**
Visual mediation types for Embodied Representation	13a, 13b	**0.892**
Narrative gap	11a, 11b	**0.713**

The interview

After participants answered the questionnaire, a short interview was conducted to identify the various perspectives of their experience. The interview was mainly focused on investigating the most important reasons to use an e-textile in the narrative, the most intense moments of students' experience, the emotions the experience with the e-textile evoked, as well as the reasons they would like or not to participate again in a similar project. Specifically, participants were asked to answer the following questions:

1. Was the **e-textile** important in the **narration**? Why?

2. What were the most **intense moments**, while you were wearing the e-textile and listening to the story?

3. What **emotions** did the e-textile evoke?

4. Would you like to **participate again** in a similar project in the future? Why?

Findings

The research question of this study was: Can the use of a wearable e-textile as a narrative mediation tool affect moral behaviour in students (bullying behaviour, empathy)? To answer the research question, we explored different aspects of the e-textile experience. This includes:

QUESTIONAIRE

a) The use of the e-textile in the narration

b) The darkness in the room

c) Tiredness during the experience

d) Interest during the experience

e) Concentration during the experience

f) Factors that made the experience more interesting

g) Future Students' behaviour with bullying after their experience with the e-textile

h) Cognitive and Affective Empathy after the experience

i) Effectiveness of the visual mediation types

INTERVIEW

j) Reasons to use the e-textile in the narration

k) The most intense moments

l) Emotions

m) Reasons to participate or not in a similar project in the future

Questionnaire

Results reveal that participants enjoyed the experience with the e-textile and they had a positive attitude towards the use of the e-textile in the narration since the Mean of the 14 out of 15 question groups is above 4. The only variable with a Mean below 4, is the one of the "Embodied Representation". More specifically, it seems that the "Symbolic Metaphor" variable was the most important part of the overall experience (Mean=4.80, SD=0.48). The "Symbolic Metaphor" mediation type includes the effective use of colors and patterns that function as symbols of concepts such as sadness and joy. The second most important finding is that the experience with the e-textile promoted the participants' affective empathy (Mean=4.68, SD=0.34). Moreover, the results indicate that the e-textile experience promoted an anti-bullying future behavior to students. We should also highlight that the "Embodied Representation" mediation type was the weakest one (Mean=3.95, SD=0.86).

Table. Results for every question group (Questionnaire).

	Minimum	Maximum	Mean	Std. Deviation	Cronbach's (Alpha)
symbolic_metaphor	3.50	5.00	4.8000	.48305	0.810
affective_empathy	4.00	5.00	4.6800	.34254	0.701
behaviour_with_bullying	3.75	5.00	4.6750	.40910	0.808
symbolic_representation	4.00	5.00	4.6500	.47434	0.889
tiredness	2.60	5.00	4.6000	.72419	0.732
users_interest	4.20	5.00	4.6000	.26667	<0.70
Intensity	4.00	5.00	4.6000	.45947	0.789
etextile	3.20	5.00	4.4800	.52662	0.763
role_change	3.00	5.00	4.4500	.72457	0.889
narrative_gap	3.50	5.00	4.3500	.52967	0.713
cognitive_empathy	3.00	5.00	4.3333	.56656	0.727
concentration	3.67	4.67	4.2667	.34427	0.745
darkness	3.50	5.00	4.2500	.54006	0.792
interesting_factors	3.43	4.86	4.2286	.47237	0.709
embodied_representation	2.00	5.00	3.9500	.86442	0.892

E-textile Effectiveness, Darkness Effectiveness

Regarding the effectiveness of the e-textile as a narrative mediation tool, as well as the darkness in the room, the participants answered five-point Likert scale questions (1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree).

Table. Results for the variable "e-textile effectiveness as a narrative mediator".

QUESTIONS	Mean	SD
Wearing the e-textile helped me to imagine that I am part of the story.	4.50	0.52
Wearing the e-textile helped me to understand the story	4.50	0.52
Wearing the e-textile evoked emotions and feelings about the characters.	4.50	0.70
I would like to use the e-textile in the future while I listen to a story.	4.60	0.69
My experience would not be that good without the use of the e-textile.	4.90	0.31

The results reveal that for the participants the e-textile was used effectively as a narrative mediation tool, and the user's experience would not be that good without it (Mean=4.90, SD= 0.31). The participants would like to use it again in the future (Mean= 4.60, SD=0.69), since it evoked emotions and feelings about the characters (Mean=4.60, SD=0.70). A participant underlined that in the beginning, the e-textile evoked negative emotions, like sadness, but in the end, the emotions were positive. It also enhanced users' feeling of being part of the story (Mean= 4.50, SD =0.52) as well as their understanding of the story (Mean=4.50, SD=0.52).

All in all the answers show that the e-textile was influential in the narration since almost every participant (9 out of 10) agreed that their experience would not be that good without it and they would love to use it again in combination with a narrative, since it made them feel mediated presence in the story they were listening to, understand it, as well as to experience emotions.

Table. Results for the variable "Darkness".

QUESTIONS	Mean	SD
The darkness in the room helped me to imagine that I am part of the story.	4.30	0.48
The darkness in the room did not make me feel scared.	4.00	0.66

The results reveal that the darkness in the room **affected users' experience positively**, since it enhanced their feeling of being part of the story (Mean=4.30, SD= 0.483), and they did not find the darkroom scary (Mean= 4.00, SD= 0.667). One of them noted that in the beginning, before the e-textile lighted up, he felt a bit scared, but afterwards he felt that he is moving to another world because he could not see anything else than the lights on the jumper and listen to the story.

The darkness in the room, as well as the use of the e-textile, appear to contribute to the creation of a strong mediated presence. As it is evident though, the e-textile (Mean= 4.50 SD= 0.52) seems to be slightly more important for creating the sense of being in the story than the darkness in the room (Mean= 4.30, SD=0.48)

Results for variables "Tiredness", "Variables of interesting experience", "User's interest in story's stages."

As regards the Tiredness, Variables of Interesting Experience and User's interest in the story's stages, the participants answered five-point Likert scale questions (1. Extremely Tired, 2. Very tired, 3.Moderately tired, 4. Slightly tired, 5. Not tired at all for the variable Tiredness, and 1. Strongly Disagree, 2.Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree for the variables of Interesting experience).

Table. Results for the variable "Tiredness."

QUESTIONS	Mean	SD
Circle the extent of tiredness you felt in the stages below: The tree introduces the story-time and place.	4.80	0.63
Marinos is being bullied in the school playground while he is playing football with his friend.	5.00	0.00
When Marinos sits under the tree, the bullies find him again, and they laugh at him.	4.60	1.26
Marinos speaks out for the first time against the bullies.	4.40	1.26

The bullies change their mind, decide to become friends with everyone in the school and regret their past behaviour.	4.20	1.22

The results reveal that the **tiredness slightly increased** between the first and the last stage. However, the tiredness users felt **fluctuated between the answers "not tired at all" and "slightly tired"**. At the beginning of the story, the users were not tired (Mean=4.80, SD=0.63), when the first bullying incident happened, users were not tired at all (Mean=5.00, SD=0.00). Similar are the results for tiredness during the second bullying incident (Mean=4.60, SD=1.26). During the "Marinos' speaking out stage" (Mean= 4.40, SD=1.26) and "Bullies' behaviour change stage" (Mean= 4.20, SD=1.22), users' tiredness increased with a tendency to "slightly tired". All in all, the results show that participants felt a slightly increased tiredness at the end of the story, which suggests that the **duration of 10 minutes is probably slightly tiring for students of that age.**
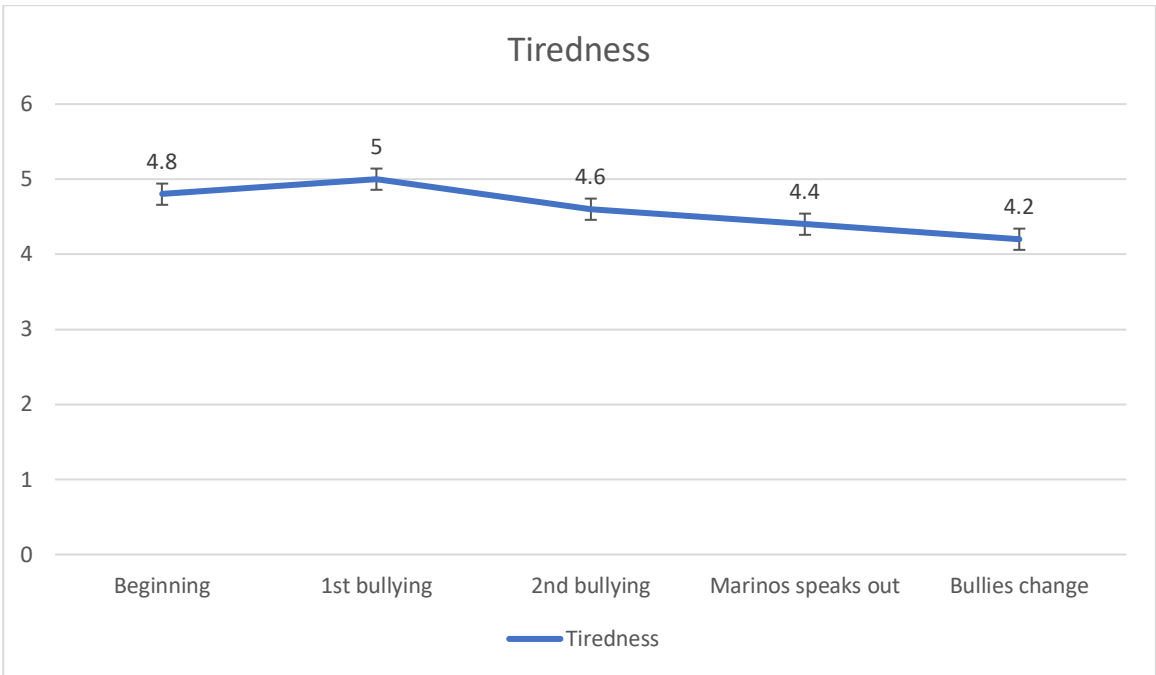
Table. Results for the Variables of Interesting experience

QUESTIONS	Mean	SD
Which of the variables below do you think made your experience in the room more interesting: The e-textile	4.80	0.42
The sound effects	4.40	0.51
The voice of the characters	4.30	0.67
The story	4.90	0.31
The darkroom	3.90	0.99
When the narrator was asking questions	4.40	0.84
When the narrator was asking you to move parts of your body	4.00	0.66

The results reveal users had an interesting experience because of the story they listened to (Mean= 4.90, SD=0.31), the use of the e-textile in the narration (Mean= 4.80, SD=0.42), the sound effects (Mean=4.40, SD= 0.51), as well as because of the second person questions the narrator used in the narrative (Mean=4.40, SD=0.84). Also, the character's voice in the narration (Mean=4.30, SD=0.67), as well as the fact that they were asked to move parts of their body (Mean=4.00, SD=0.66), made their experience more interesting. The two most important variables that made their experience interesting were the story and the use of the e-textile in the narration. The sound effects and the second person questions were chosen as the third most important variable, while the characters' voice and the body movements appeared to be in the fourth and fifth place, respectively. The results also reveal that for users, the darkness in the room did not play such an essential role for their experience (Mean=3.90, SD=0.99).

Results for the variables "User's interest in story stages" and "Concentration."

As regards the variables "User's interest in story stages" and "Concentration", participants answered five-point Likert scale questions (1. Not interested at all, 2. Slightly interested, 3. Moderately interested, 4. Very interested, 5. Extremely interested for the first variable and 1. Strongly Disagree, 2. Disagree, 3. Neither agree or disagree, 4. Agree, 5. Strongly Agree for the second variable).

Table. Results for the Students' Interest in Story's Stages

QUESTIONS	Mean	SD
Circle the extent of interest you felt in the stages below: The tree introduces story time and place.	3.70	0.94
Marinos is being bullied in the school playground while he is playing football with his friend.	4.60	0.52
When Marinos sits under the tree, the bullies find him again, and they laugh at him.	4.80	0.63
Marinos speaks out for the first time against the bullies.	4.90	0.32
The bullies change their mind, decide to become friends with everyone in the school and regret their past behaviour.	5.00	0.0

In response to the question about Students' Interest in the story's stages, participants indicated that their interest was fluctuated between **"moderately interested" and "extremely interested".** In the beginning, they were "moderately interested" in the story, but their interest got increased up to "extremely interested". More specifically, In the first stage, when the tree introduces the story time and place, the participants reported that they were moderately to very interested (M=3.70, SD= 0.94). In the second stage, when the first bullying incident happens, participants reported that they were very

interested in the story (M= 4.60, SD= 0.52). During the third stage, while the second bullying incident takes place, again, participants' interest got increased slightly (M=4.80, SD=0.63). The same applies to the fourth stage when Marinos speaks out for the first time (M=4.90, SD=0.32). All participants found the last stage, when the bullies change their mind, extremely interesting (M=5.00, SD=0). The results reveal that students' interest got increased with the story's succession. All in all, they found their experience interesting, and the final stage was the most interesting.
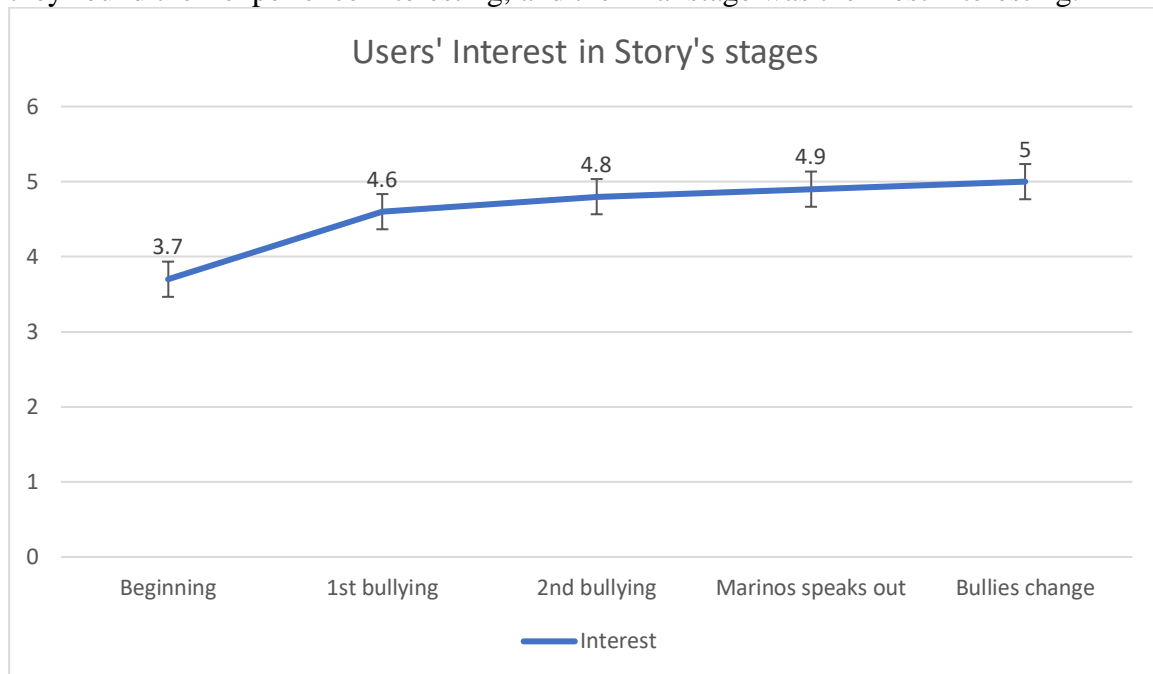
Table. Results for the variable "Concentration".

QUESTIONS	Mean	SD
Wearing the e-textile helped me to concentrate on the story.	4.50	0.52
The mirror helped me to concentrate on the story.	4.50	0.52
The darkness in the room helped me to concentrate on the story.	4.40	0.51

The results reveal that the e-textile enhanced participants' concentration on the story (Mean=4.50, SD=0.52) and the same results apply for the use of the Mirror (Mean=4.50, SD=0.52). The darkness in the room also enhanced their concentration (Mean=4.40, SD= 0.51).

Results for the variables "Behaviour with bullying", "Cognitive Empathy", "Affective Empathy."

As regards the variables "Behaviour with bullying", "Cognitive Empathy", "Affective Empathy", participants answered five-point Likert scale questions (1.Strongly Disagree – 5. Strongly Agree).

Table. Results for the variable "Behaviour with bullying".

QUESTIONS	Mean	SD

The experience with the wearable changed the way I think about or deal with bullying.	4.40	0.69
After my experience with the wearable, it is more unlikely to bully someone.	4.70	0.48
After my experience with the wearable, if I witness someone being bullied, I will help them.	4.90	0.31
After my experience with the wearable, before I act, I will think of how my behaviour will influence other people.	4.70	0.48

The results reveal that their experience in the mediated environment contributed to a more defending behaviour when they witness a bullying incident in the future (Mean= 4.90, SD= 0.31). Participants also claimed that it also helped them to realise that in the future before they act they need to think how their behaviour will influence other people (Mean= 4.70, SD= 0.48) and that it is more unlikely now for them to bully someone (Mean= 4.70, SD= 0.48). The experience with the wearable also changed the way they think about or deal with bullying (Mean= 4.40, SD= 0.69).

Table. Results for the variable "Cognitive Empathy".

QUESTIONS	Mean	SD
By wearing the e-textile, it helped me imagine what Marinos was thinking.	4.60	0.69
By looking at the visuals (LEDs) on the mirror, it helped me predict how the characters will react or feel in the story.	4.10	0.73
By listening to the characters' voice in the narrative, I could tell if Marinos was happy or not by the tone of his voice.	4.30	0.67

Results reveal that wearing the e-textile helped the users imagine what the protagonist was thinking (Mean= 4.60, SD=069) and by listening to the character's voice in the narrative, they could tell whether he was happy or sad (Mean= 4.30, SD= 067). Also, the visuals on the mirror helped them predict how characters would react (Mean= 4.10, SD= 073). Two participants explained Marinos' way of thinking by giving as an example the reason of Marinos not speaking up at the beginning of the story " *when the bullies talked to him; he was thinking that he is alone and was scared of them*", *the bullies were many. They were against him, but he was alone, that is what he was thinking*". Moreover, some of them noticed that "Marinos' voice was an adult's voice" and that there were changes on the tone of characters' voice depending on their emotional state, "*Marinos changed the tone of his voice when he spoke*

up". All in all, it seems that their experience with the e-textile contributed to the promotion of their Cognitive Empathy.

Table. Results for the Variable "Affective Empathy".

QUESTIONS	Mean	SD
It made me sad to listen that Marinos could not find anyone to play with.	4.80	0.42
When Marinos was being attacked by his peers, it made me feel sad.	4.50	0.70
I got upset when I heard Marinos being hurt.	4.50	0.52
It upset me when Marinos was being laughed at.	4.70	0.48
By wearing the e-textile, it made me feel how Marinos was feeling.	4.90	0.31

Results reveal that the fact that the participants wore the e-textile helped them feel how the protagonist was feeling (Mean= 4.90, SD= 0.31). Participants also answered that it made them sad to listen that the protagonist could not find anyone to play with (Mean= 4.80, SD=0.42) and they got upset when the protagonist was being laughed at (Mean= 4.70, SD=0.48). Moreover, they also got upset when the protagonist was being hurt (Mean= 4.50, SD= 0.52) and it made them feel sad when he was being attacked by his peers (Mean= 4.50, SD= 0.70). Some participants explained that the e-textile helped them feel how Marinos was feeling, because "*I could see the smiley and sad faces and the chain around my neck made me feel that I could not talk*", "*His heartbeat was beating like my heart, I felt how he was feeling*". To conclude, results suggest that their experience with the e-textile contributed to the promotion of their Affective Empathy.

Results for the variables Visuals for "Symbolic Representation", "Role Change- Costume", "Intensity", "Symbolic Metaphor", "Embodied Representation", "Narrative Gap."

Findings suggest that the visual mediation types were effectively used to mediate the narration since the Mean of almost every type (5 out of 6) was above 4. The only visual type with a Mean below 4, was that of the Embodied Representation (Mean=3.95, SD=0.86).

Table. Results for every visual mediation type.

	Minimum	Maximum	Mean	Std. Deviation
symbolic_metaphor	3.50	5.00	4.8000	.48305
symbolic_representation	4.00	5.00	4.6500	.47434
Intensity	4.00	5.00	4.6000	.45947
role_change	3.00	5.00	4.4500	.72457

narrative_gap	3.50	5.00	4.3500	.52967
embodied_representation	2.00	5.00	3.9500	.86442

Table. Results for the variable "Visual mediation types for Symbolic Representation".

QUESTIONS	Mean	SD
The shape of the heart on the e-textile helped me understand that Marinos' heartbeat increases because of running or the fear he was experiencing during break time at school.	4.70	0.48
The red line was underlining that the bullies were bigger than Marinos.	4.60	0.51

Results imply that both the visual of the heart shape (Mean= 4.70, SD= 0.48) on the e-textile and the red line (Mean= 4.60, SD=0.51) operated as a symbolic representation mediation type in the narration.

Table. Results for the variable "Visual mediation types for Role Change".

QUESTIONS	Mean	SD
The shape of the tree on the e-textile helped me understand that the tree is talking	4.60	0.69
The shape of the owl helped me understand that the owl is talking.	4.30	0.82

Results suggest that both the visual of the tree (Mean= 4.60, SD= 0.69) on the e-textile and the owl (Mean= 4.30, SD= 0.82) operated as a Role change- Costume mediation type.

Table. Results for the variable "Visual mediation types for Intensity".

QUESTIONS	Mean	SD
The right and left arrows on the e-textile made more intense the moment of Marinos looking to the right and left side in order to make sure he is safe.	4.50	0.52
The red hands, in combination with the X on the e-textile, made more intense the feeling of rejection that Marinos was receiving from his peers.	4.70	0.48

Results suggest that both the visual of the red hands (Mean= 4.70, SD= 0.48) and the arrows (Mean= 4.50, SD= 0.52) made the moments of narration more intense.

Table. Results for the variable "Visual mediation types for Symbolic Metaphor".

QUESTIONS	Mean	SD
The red colour on the e-textile was representing power, aggressiveness and pain.	4.70	0.67
The blue colour on the e-textile was representing fear.	4.90	0.31

Results suggest that both the blue colour on the visuals (Mean= 4.90, SD= 0.31) and the red colour (Mean= 4.70, SD= 0.67) operated as Symbolic Metaphor.

Table. Results for the variable "Visual mediation types for Embodied Representations".

QUESTIONS	Mean	SD
The chain around the neck was underlining that the characters were not able to speak out.	3.90	0.87
The breaking chain around the neck underlined that Marinos' spoke out and supported himself against the bullies.	4.00	0.94

Results suggest that the visual of the breaking chain around user's neck operated as an embodied representation "*I could see the chain around my neck, and it made me feel that I could not talk",* (Mean= 4.00, SD= 0.94). However, some users did not feel that the visual of the chain was a clear embodied representation.

Table. Results for the variable "Visual mediation type Narrative Gap".

QUESTIONS	Mean	SD
The absence of light at the beginning of the story attracted my interest to find out who the narrator is and where the story takes place	4.40	0.69
The absence of light in the middle of the story gave me some time to think about the characters' situation.	4.30	0.48

Results suggest that the absence of Light during the narration at the beginning of the story attracted users' interest to find out who the narrator was (Mean= 4.40, SD= 0.69), as well as the absence of light in the middle of the story, gave them some time to think about characters' situation (Mean= 4.30, SD= 0.48).

Interview

Thematic analysis was used for analysing interview's qualitative data, and a six-step process was followed, including 1. Familiarization with the data by transcribing the recordings, reading through the

text and taking initial notes. 2. Coding phrases or sentences by giving them labels. 3. Generating themes by combining codes. 4. Reviewing themes. 5. Defining and naming themes. 6. Writing up the analysis of the data.

Generally, participants reacted positively to the wearable e-textile experience.

Reasons to use the e-textile in the narration (Question 1)

- When participants were questioned on the reasons to use the e-textile in the narration, nearly all, 9 out of 10, claimed that the e-textile operated as a **mediation tool**, which was illustrating Marinos' emotions and feelings and this fostered in them a **sense of identification** with the characters. Feelings of sadness and fear were underlined as some of the emotions the use of the e-textile helped them identify with. Participant also associated colours of the e-textile with characters' emotions.

"...it was showing the sad face and how Marinos was feeling and it helped me understand when he was feeling sad or happy and strong... ",

"...I understood more intensively how Marinos felt...",

"...I liked how it expressed the emotions and helped understand how they were feeling... "

"...I liked that the e-textile showed faces of what they felt and other things involved in the story, like blue colour for fear, red colour for pain. I wouldn't understand how they were feeling.."

"...I wouldn't understand how Marinos was feeling when he was being bullied...",

"...it helped me experience Marinos' feelings."

"...When the wearable was flashing, I felt like I was in his place, and could feel the same things with him somehow. If I wasn't using the e-textile, I could not feel all those emotions..."

"Yes, it helped me to imagine the story and think about what could happen to me if I was experiencing Marinos' situation."

- Every participant agreed that the use of the e-textile was influential in the narration. **5 out of 10 participants** noted that the use of the e-textile was vital since it helped them to get a deeper **understanding** of the story by **creating** mental representations and **images**. Some of them noted that they were impressed by the **atmosphere** in the room. 2 out of 10 also claimed that the e-textile brought the story to life. They also claimed that the **combination** of light on the jumper, darkness, sound effects, colours, and the story made their experience more **realistic.**

"...it helped me understand the story and take in what it was..."

"...and I found it very interesting because it made the story more lively",

"It would be harder to understand the story; it would be like as listening to any other story."

"Yes, because without that, I don't think I would understand the story as much as I understood when I was wearing it."

"The e-textile, the sound effects, the story, and the darkness in the room, as well as the colours and shapes, have made the story look more realistic. Without the e-textile, it wouldn't be so easy to visualize the story and the characters' emotions."

- 4 out of 10 also underlined that the use of the e-textile made their experience more **entertaining** and fun. For that reason, they would like to use it again in combination with a narrative.

" Yes, because it was fun, and I wanted to see what will happen next in the story... ",

"The e-textile was important; without it, I would be bored."

"I would get tired more easily, and I wouldn't like to listen to the story...",

"I prefer wearing a t-shirt like this every time I listen to a story, rather than reading the story because this is a more effective and entertaining way to understand the story..".

- 2 out of 10 mentioned that the e-textile drew their **attention** and helped them concentrate on the story. One participant also underlined that the fact that he had not wear an e-textile before attracted his interest.

"The wearable e-textile was a special experience for me since I had not experienced something similar before. It drew my attention...".

"Yes, because it kept me focused on the story."

Reasons to use the e-textile in the narration (Question 1)

Bar chart values:
- illustrated emotions and feelings: 9
- understanding of the story: 5
- fun: 4
- attracts their attention: 2

Legend: Reasons to use the e-textile in the narration
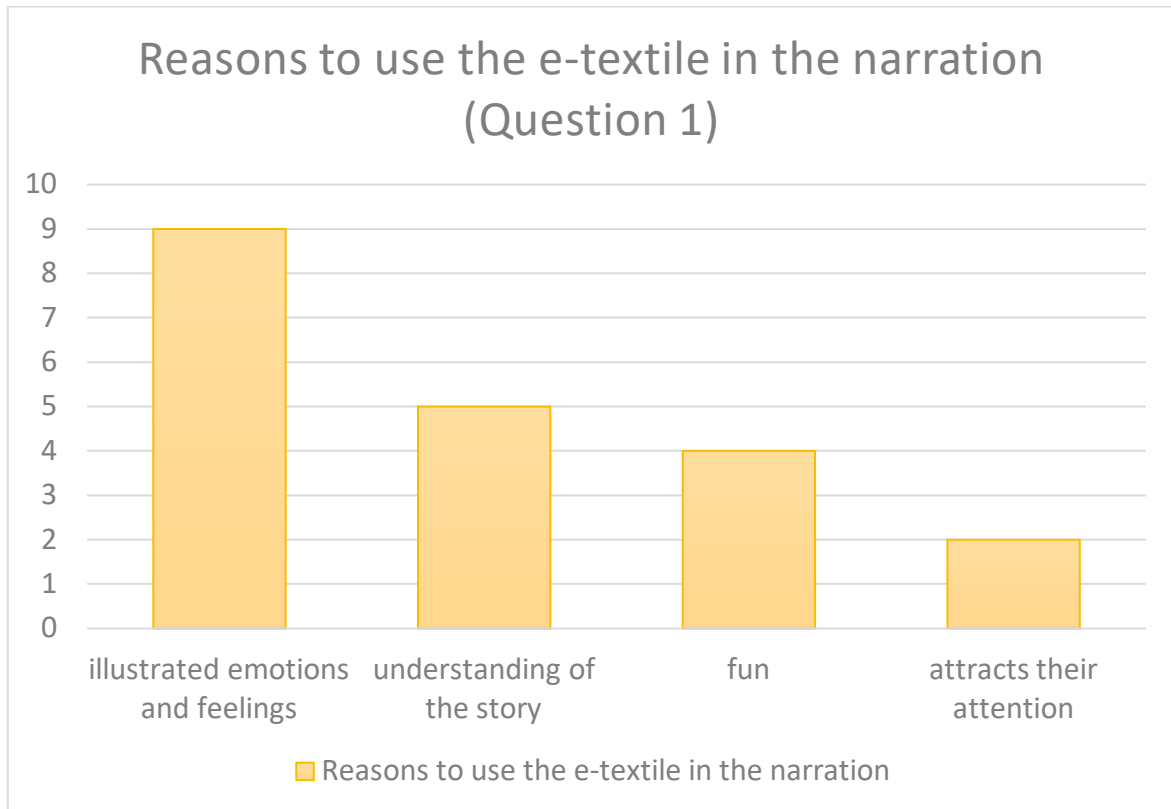
The most intense moments of users' experience (Question 2)

- 4 out of 10 participants underlined that the **flashing heartbeat** was one of the most intense moments of their experience. They recognized that the flashing heart was a symbolic representation of Marinos' heartbeat, which was getting faster and faster because of his anxiety and fear. They also noted that the flashing heart, in combination with the sound effect of a heartbeat, made them identify with the character and take his place. The flashing heartbeat gave emotional content and interaction to the narration.

"Marinos heartbeat every time he was trying to escape from the bullies",

"When Marinos run away to hide from the bullies, and I felt his heartbeat",

"The flashing heartbeat and the sound of the heartbeat made me feel that it was me feeling anxious and scared."

"The heartbeat ".

- 3out of 10 noted that the **red visuals on the e-textile**, especially the **visual X** flashing on the matrix screen, were also some of the intense moments of their experience. The red colour on the e-textile made the narrative experience more intense.

"The flashing red x and the red lines on my hands when Marinos was being bullied and felt bad about his appearance".

"The red colour and the x on the e-textile",

"When everything was like flashing red, the x and everything."

- Moreover, moments, where the visual of the **sad face or smiley face** appeared on the matrix, were described as intense. 2 out of 10 participants underlined that the sad and smiley faces brought intensity into their experience. The sad and smiley faces in combination with the tone of the character's voice, appeared to be an effective way of creating an intense moment that catches their eye and mind.

"The sad and the smiley faces",

"When Marinos was sad because he had been laughed at, I could see his sad face on me... and listen to his sad voice.."

- It is of great importance to note that 2 out of 10 also underlined that some of the visuals in **combination with the sound effects** gave intensity to the moment and made them identify with the characters and take their role.

"The sad and the smiley faces, the magical sound effect and the rainbow on the jumper",

"The flashing heartbeat and the sound of the heartbeat made me feel that it was me feeling anxious and scared."

- Another intense moment was when the visual **chain** around their neck **broke (1 out of 10)**. The chain appeared to be a part of their body and not just an external object on the jumper (in my neck).

"When Marinos spoke up for the first time, and the chain in my neck broke."

The most intense moments of users' experience (Question 2)

A bar chart titled "The most intense moments of users' experience (Question 2)" with a y-axis ranging from 0 to 4.5. The bars show:
- flashing heart beat: 4
- red visuals: 3
- sad/smiley face: 2
- visuals in combination with sound effects: 2
- the broken chain: 1

Legend: The most intense moments of users' experience
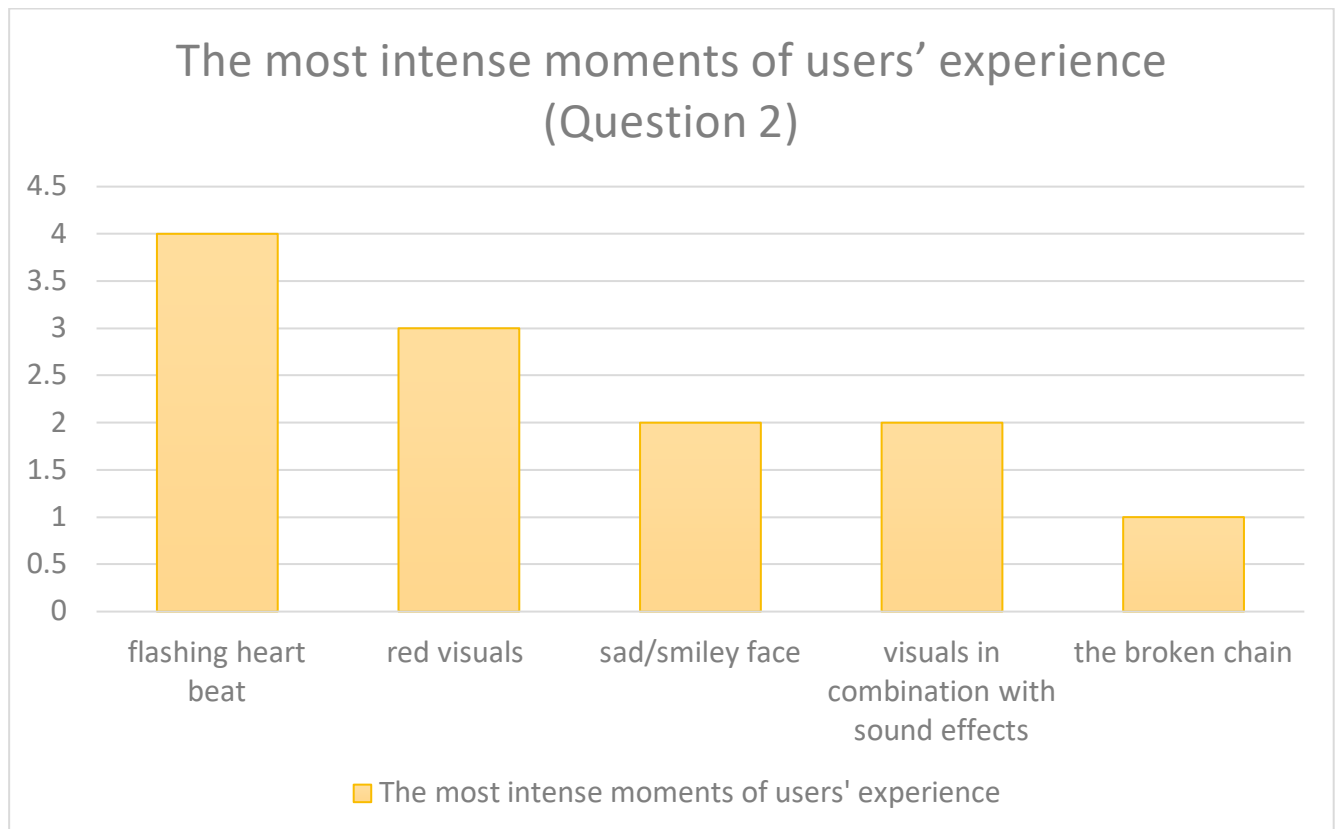
Emotions evoked the experience with the e-textile (Question 3)

- 8 out of 10 participants underlined that they experienced the emotion of **Sadness** and **Upset**. They could recognize the emotion of sadness in characters, but also identify with it.They felt sad because Marinos was getting bullied, and he was left alone. "Seeing" one of the characters to experience loneliness and bullying at school made them feel sad. The sound in combination with the colours also promoted sadness. Their answers imply that the "symbolic metaphor" mediation type with the use of colour communicated emotions to the participants. The blue colour was related to sadness.

"Sadness when Marinos was being bullied and feeling lonely",

"The emotions that characters were feeling...When the character was sad, I felt sad because he was feeling lonely and scared...",

"The sound effects in combination with the LEDs evoked sad emotions...",

"Marinos' emotions, sad, lonely...",

"Sad when Marinos was being bullied and when he wanted to speak out, but he felt that he couldn't...",

"Sadness...",

"...I felt his sadness when the bullies laughed at him...",

"I think that the light and the colours depicted emotions. When the blue lights turned on, Marinos was feeling upset and scared ".

- 5 out of 10 also noted that another emotion the e-textile evoked was that of **Joy**. The visual of the rainbow, as well as some sound effects and the story's succession, brought happy emotions into the surface. Also, Marino's pride in the end of the story, made them feel happy.

"The sound effects, in combination with the LEDs evoked sad and happy emotions. Like the rainbow in combination with the magic sound effect evoked happy emotions."

"The emotions that characters were feeling…When he felt pride for standing up for himself, I felt happy and proud of doing that",

"Marinos' emotions, sad, lonely, happy",

"…but also happy when he spoke out".

- 2 out of 10 experienced the emotion of **fear,** because they identified with characters' situation. Also, they recognized that blue was communicated the emotion of fear.

"The emotions that characters were feeling fear because you are getting laughed at…"

"I think that the light and the colours depicted emotions. When the blue lights turned on, Marinos was feeling upset and scared ".

- 2 out of 10 participants also experienced the emotion of **anger** across other emotion**.**

"Sadness, anger, and suspense."

"Sadness, anxiety, anger".

- 2 out of 10 participants experienced the emotion of **anxiety**.

"It caused me a lot of anxiety when it started to talk about Marinos trying to find a place to hide",

"Sadness, anxiety, anger".

Emotions the experience with the e-textile evoked (Question 3)

A bar chart titled "Emotions the experience with the e-textile evoked (Question 3)" with the following values:

- sadness/upset: 8
- joy: 5
- fear: 2
- anger: 2
- anxiety: 2

Legend: Emotions the experience with the e-textile evoked
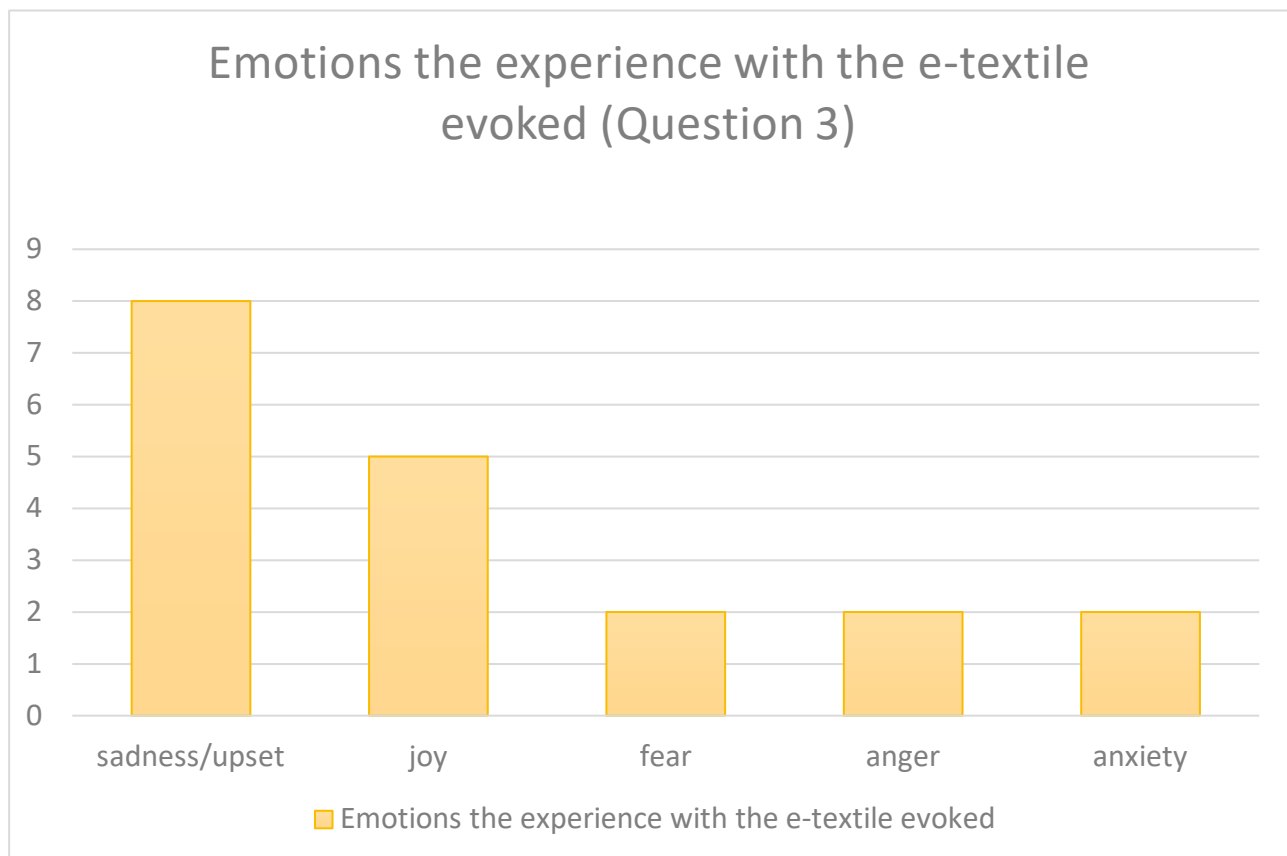
Reasons they would like or not to participate again in a similar project (Question 4)

Every participant stated that they would like to experience the whole process again.

- The main reason was the story. 4 out of 10 participants said that they would like to participate again in the same project because they liked the **story**. They found the story comprehensible and reminded them of real life situations.

"Yes, the wearable is very cool, and I liked the story."

"I really want to participate again in this project. It's fun! The story's not one of those stories that you don't understand."

"Yes, I want to listen again to Marinos' story",

"Yes, the wearable is very cool, and I liked the story. It reminded me of how my friend felt when she got bullied."

- 3 out of 10 explained because they want to wear the **e-textile** again. They found the wearable e-textile exciting and they would like to use it in combination with other narratives too.

"Definitely! I liked the jumper, the sound effects!"

"Yes, I would love to listen to a different story by using this e-textile."

"Yes, the wearable is very cool, and I liked the story."

- One of them underlined that she liked the **environment.**

"yes, the mood in the room, the darkness, made you feel like you are entering a new world...".

- 1 out of 10 because the project was **different** to any other experiences they had .

"Sure! I enjoyed the project; it was something different!"

- Also, a girl noted that the reason she wanted to participate in a similar project was the fact that she understood how someone else was **feeling**.

"Yes, because I understood how someone else was feeling ".

Reasons they would like or not to participate again in a similar project (Question 4)

Category	Value
liked the story	4
wear the e-textile	3
the general environment	1
it's a different experience	1
feel someone else's feelings	1
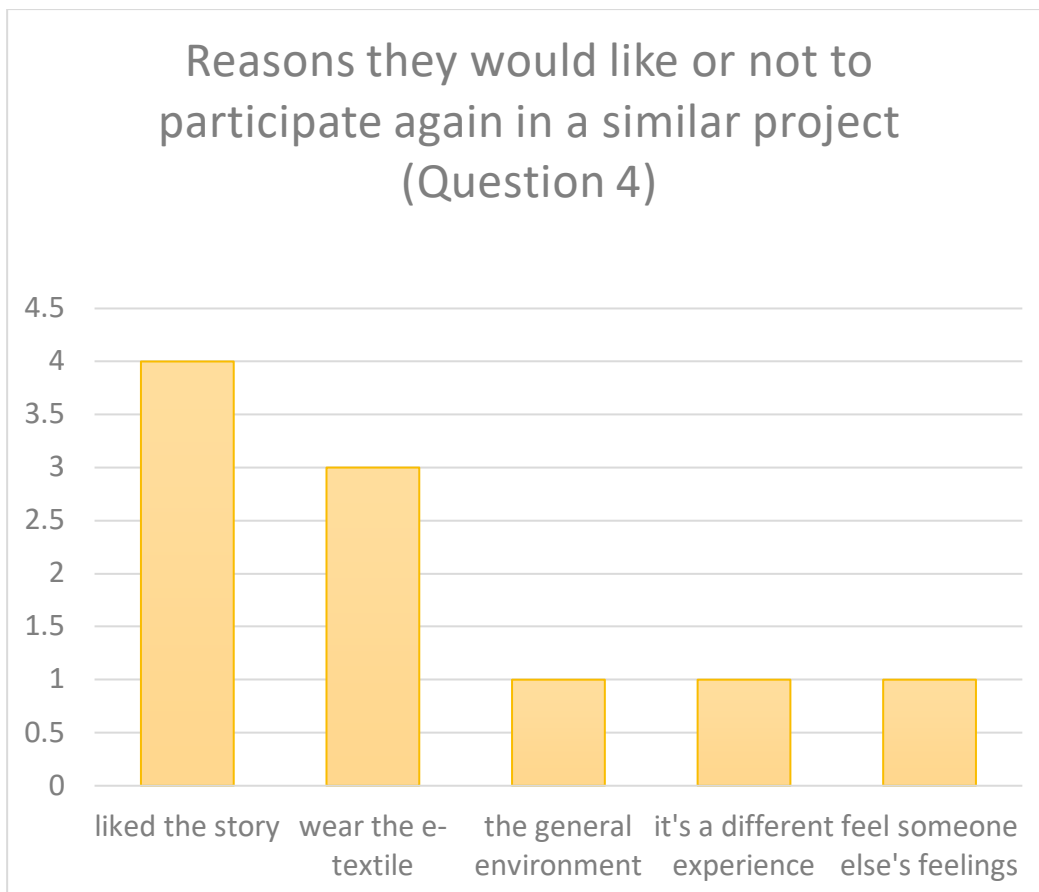
Discussion and Future Considerations

Previous research has noted that empathy might be negatively associated with bullying (Gini, Albiero, Benell & Altoè, 2007). For that reason, several Prevention Bullying Programs aim to prevent or reduce bullying, as well as to achieve better peer relations at school by building empathy (Malti T. et al. 2016). Stories might have both a cognitive and emotional impact since they can evoke empathy and a sense of identification with the characters (Oatley K., 1994). For that reason, in this research, the use of a narrative about bullying was combined with the use of the e-textile as a narrative mediator aimed at increasing the user's empathy by activating the user's embodied experience in the mediated world. By encouraging children to empathize with fictional characters, we aimed at developing their empathic skills and their ability to empathize with people in real life. Overall, the results indicated that the participants enjoyed their interaction with the wearable e-textile. Almost every participant (9 out of 10) agreed that their experience would not be that good without it, and they would love to use it again in combination with a narrative. The study revealed the following findings.

First of all, the results suggest that the e-textile operated effectively as a narrative mediator, since it made them feel present in the story they were listening to (*"the mood in the room, the darkness, made you feel like you are entering a new world...you become a part of the story"*), helped them understand the story (*"It would be harder to understand the story without it, it would be like as listening to any other story."*), as well as to experience emotions (*"If I wasn't using the e-textile I could not feel all those emotions..."*) while listening to the story.

Participants seemed to understand the characters' thoughts and feelings by taking their perspective (*"...I liked that the e-textile showed faces of what they felt and other things involved in the story, like blue colour for fear, red colour for pain. Without it I wouldn't understand how they were feeling..."*), and emotionally identify with what the characters were experiencing in the story (*"...When the wearable was flashing, I felt like I was in his place, and could feel the same things with him somehow. If I wasn't using the e-textile I could not feel all those emotions..."*). In particular, some of the main emotions they experienced were those of sadness, joy, fear, anger, and anxiety. These evidence point towards the idea that the use of the e-textile as a narrative mediator, might promote not only the cognitive empathy of the students but also their affective empathy. It is essential to highlight, though, that the story, in combination with the e-textile were the two most important factors that made their experience interesting. Taken together would seem to suggest that the e-textile, in combination with a non "eye-catching story," would not achieve the same results.

Regarding the results for "Behaviour with Bullying," it is important to highlight here that the majority of the participants had stated that they had not bullied anyone in the past and that is very little possible (2 of them) or not possible at all to bully someone in the future. However, after the experience with the e-textile the two participants who had stated that it was very little possible to bully someone in the

future, stated that they strongly agree that it is more unlikely to bully someone. Participants seemed to benefit from their experience with the e-textile. Also, results suggest that in the future, participants will have a more defending behaviour when they witness a bullying incident, they will think how their behaviour will influence other people.

Also, it is essential to underline that students' tiredness increased between the first and the last stage of the story. Their tiredness fluctuated between the answers "not tired at all" and "slightly tired", which suggests that the duration of 10 minutes and the length of the story (1887 words) were only slightly tiring for students of that age. Their slightly tiredness might have been due to the conditions in the room since the weather was hot, and the students were wearing the long sleeve jumper. However, the results reveal that their tiredness did not influence their interest in the story since their interest got increased between the first and the last stage of the story. This finding indicates that the study used the right combination of factors (story, e-textile, sound effects, prompting questions, voice, darkness) that made the participants keep their interest in the story alive.

Moreover, the narrative use of Visuals seems to be of great importance for the effective use of the e-textile as a narrative mediator. The Visual mediation types (Symbolic Metaphor, Symbolic Representation, Intensity, Role Change – Costume, Embodied Representations, Narrative Gap) were married up to stimulate participants' curiosity and attract their attention, a critical element to supporting narrative understanding. The chosen shapes and colours of each visual mediation type seemed to provide character insight and intentionally sent cues for the audience to partake in understanding the perspectives of different characters, along with the embodied experiences the audience developed. Most participants recognized that the use of colours and smiley or sad faces on the e-textile were linked to emotions (*"…I liked that the e-textile showed faces of what they felt and other things involved in the story, like blue colour for fear, red colour for pain. I wouldn't understand how they were feeling.."*) and they made the narrative experience more intense. Taken all together, the findings underline that the visual mediation types supported the creation of mental images and enhanced the user's mental representations of the story, by giving emotional content and interaction to the narrative and increasing the user's sense of presence. This lends support to previous findings that the way the tangible technology interacts with the user and their environment is remarkable (Pantouvaki, 2014). In tangible technology, the body becomes an emotional object that focuses on human experience beyond the conventional styles of expression. Embodied experiences create the sensation of personally having the experience. In addition to the embodiment, people can understand and empathize more when they comprehend another person's subjective experience and environment.

It is plausible that a number of limitations may have influenced the results obtained. To begin with, the small sample size does not allow us to generalize the results of the study. The research took place in London, where it was not feasible for the researcher to have access to more students who were fluent in both Greek and English language. However, it is important to highlight that it was an explorative

research, and its contribution lies in setting the first step at the exploration of the current topic. Future studies on the current topic are, therefore suggested in using a larger sample in order to be able to generalize the results. An additional limitation might have been the fact that the researcher was one of the teachers teaching in the school. Further data collection from students of different schools would be needed to determine the effectiveness of the e-textile as a narrative mediator that promotes empathy. Also, the use of pre and post-tests about bullying behaviour would give more precise insights into any behavioural change about bullying. Also, future research could focus on exploring the use of the e-textile in a classroom after a bullying incident occurred.

The suggested dictionary was a first attempt to find ways in which the e-textile can communicate meanings and concepts of a narrative. Future research could examine the use of the suggested mediation types in different stories and different age groups. Also, an important aspect of future research could be the invention of more visual mediation types that communicate same or different meanings and concepts to the ones we introduced. Moreover, the wearable e-textile could be utilised in a mixed reality environment as a costume that transforms the user into a character of the mixed reality environment.

Moral development is as vital as physical and intellectual development. Building moral lives and having moral values integrated into daily thoughts, feelings, and actions is essential to any democratic society. An important moral issue education and parents have to deal with is that of bullying. Bullying is an important issue because it affects lots of young people and happens in many schools. This study suggests that wearable e-textile technology, in combination with the narrative can be used in prevention bullying and empathy training programs. The prospect of being able to promote empathy in students and prevent or reduce bullying with the narrative use of an e-textile serves as a spur to future research. The findings of this study support the idea that by introducing new technologies to subtly help children identify and understand the emotions of others, we could promote their empathy and moral understanding as a result (Stern & Cassidy, 2017).

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Appendix

The story "Facing my biggest fear" - "Αντιμέτωπος με τον μεγαλύτερό μου φόβο»

Μέλλον

(Ακούγονται φωνές παιδιών που βγαίνουν έξω για διάλειμμα- στο ρούχο σκοτάδι)..

- Κοίταξέ τους πόσο χαρούμενοι είναι όλοι! Είμαι τόσα χρόνια σε αυτό το σημείο. Κάθε μέρα παρακολουθώ τα παιδιά όταν βγαίνουν στην αυλή. Τα βλέπω να τρέχουν, να χορεύουν, να παίζουν. Δεν τους έχω δει ποτέ πιο χαρούμενους! Τα πράγματα όμως δεν ήταν στο παρελθόν έτσι… Όλα άλλαξαν πριν έξι μήνες...θυμάσαι; *(Ακούγεται ο ήχος που σηματοδοτεί την μεταφορά στο παρελθόν).*

Ο Μαρίνος από την προοπτική του δέντρου

- *(Ακούγεται το κουδούνι του σχολείου και ακολουθεί σιγή για λίγα δευτερόλεπτα. Στη συνέχεια, ακολουθεί το πρώτο άναμμα της μπλούζας με σχήμα καρδιάς, ενώ παράλληλα ακούγονται βήματα να τρέχουν και λαχανιασμένη φωνή για κάποια δευτερόλεπτα)*

- Να τος πάλι ο Μαρίνος τρέχει σαν κυνηγημένος. Κοιτάει δεξιά *(ανάβει βελάκι δεξιά)*, κοιτάει αριστερά *(ανάβει βελάκι αριστερα)*. Ευτυχώς, αυτή τη φορά κατάφερε να ξεφύγει. Για ακόμα μία φορά βρίσκει καταφύγιο στην αγκαλιά μου και ξεσπά σε κλάματα *(εμφανίζεται στο ματριξ το μοτίβο βροχή)*. Την ώρα της Γυμναστικής είναι τόσο διαφορετικός όμως. Πριν λίγες ώρες έπαιζε ποδόσφαιρο *(εμφανίζεται στο ματριξ κίτρινο χαμόγελο)* και γελούσε με τους συμμαθητές του. Έβαλε μάλιστα και 2 γκολ. Είναι αστέρι στο ποδόσφαιρο όλοι το λένε!! Μόλις χτυπάει το κουδούνι για διάλειμμα όμως *(ακολουθεί σιγή για κάποια δευτερόλεπτα, ενω παράλληλα εμφανίζεται στο μάτριξ το μοτίβο βροχή)*. Το σώμα του κυριεύεται από φόβο και τρέχοντας (*εμφανίζεται στο μάτριξ το μοτίβο καρδιά να αναβοσβηνει)* βγαίνει πρώτος από όλους στην αυλή και έρχεται εδώ, γιατί δεν θέλει να τον δουν οι "μεγάλοι".

- (Εκφοβιστές) Τρέξε τρέξε ασχημόφατσα, όπου και να πας θα σε βρούμε χαζούλιακα!

- Προτιμάει στο διάλειμμα να μένει μόνος *(εμφανίζεται στο μάτριξ το μοτίβο τελεία)*. Δεν παίζει ποδόσφαιρο με τους συμμαθητές που τόσο πολύ το αγαπάει. Μερικές φορές μέσα στο παράπονό του μου μιλάει…

Η εξομολόγηση του Μαρίνου

(Εμφανίζεται στο μάτριξ το μοτίβο Μαρίνος- μπλε άτομο)

- (Μαρίνος) Κάθε φορά που βγαίνω στο διάλειμμα και με βλέπουν ο Γιώργος και οι φίλοι του από την Έκτη τάξη με φωνάζουν

(Εμφανίζεται στο μάτριξ το μοτίβο εκφοβιστές- δύο κόκκινα άτομα)

- (Εκφοβιστές) έι ασχημόφατσα με σιδεράκια, , είσαι ένας χαζούλιακας, ένας άχρηστος..)))

- (Μαρίνος) ...Με κυνηγούν *(εμφανίζεται στο μάτριξ το μοτίβο καρδιά να αναβοσβήνει)* και θέλουν να με πιάσουν για να με κοροϊδέψουν *(εμφανίζεται στο μάτριξ το μοτίβο λυπημένο πρόσωπο)*.

- (Εκφοβιστές) Άνοιξε το στόμα σου να δούμε την μασέλα του παππού.

- (Μαρίνος) *(Εμφανίζεται το μοτίβο Μαρίνος)* Εχθές έπαιζα ποδόσφαιρο με τον συμμαθητή μου τον Αντρέα στο διάλειμμα.. και...εμφανίστηκαν αυτοί πάλι…

- (Εκφοβιστές) *(Εμφανίζεται το μοτίβο εκφοβιστές)* Σταμάτα να παίζεις με αυτόν τον ασχημόφατσα, δεν τον βλέπεις πώς είναι;

- (Μαρίνος) Με έσπρωξαν και έπεσα στις λασπες κλαίγοντας *(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)*. Ο φίλος μου έφυγε τρέχοντας…Αντρέα πού πας; Μην φεύγεις. Μη μ' αφήνεις μόνο…*(Ακούγονται γέλια)*

- (Μαρίνος) Φταίω εγώ; *(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)* η εμφανιση μου; *(εμφανίζεται στο μάτριξ κόκκινο x και οι ταινίες στα χέρια ανάβουν κόκκινο)*. Γιατί επιτίθενται σε εμένα;.Φταίνε τα σγουρά μαλλιά μου, τα σιδεράκια που φοράω στα δόντια, τα παπούτσια ή τα ρούχα μου; *(εμφανίζεται στο μάτριξ κόκκινο x και οι ταινίες στα χέρια ανάβουν κόκκινο)*…. Νιώθω τόσο μόνος, όλα γύρω μου είναι σκοτεινά..μακάρι να βλέπω έναν εφιάλτη...και σε λίγο να ξημερώσει για να ξυπνήσω...Τι πρέπει να αλλάξω για να γίνω κι εγώ κανονικό παιδί…; Όπως είναι όλα τα άλλα παιδιά που παίζουν και γελούν στο διάλειμμα; Γιατί με μισούν τόσο πολύ*(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)*; Δεν θέλω να μείνω άλλο εδώ… θέλω να εξαφανιστώ…*(εμφανίζεται στο μάτριξ το μοτίβο λυπημένο πρόσωπο)*. Είναι δύσκολο να εξηγήσω πώς νιώθω..είναι δύσκολο να καταλάβεις αυτό που αισθάνομαι εάν δεν έχεις ζήσει κι εσύ τον εκφοβισμό... ο πόνος είναι αβάσταχτος… *(το μοτίβο καρδιά αναβοσβήνει και παύει όταν ακούγεται η λέξη αβάσταχτος)*.

Ο εσωτερικός κόσμος του Μαρίνου

(Ακούγεται το κουδούνι του σχολείου , ενώ το μοτίβο καρδιά αναβοσβήνει στο μάτριξ).

Από εκείνη τη μέρα κάθε φορά που χτυπάει το κουδούνι του σχολείου ο Μαρίνος τρέχει… τρέχει να κρυφτεί… Κατάντησε το σχολείο ένας αγώνας μάχης, όπου υπάρχει (εμφανίζεται το μοτίβο χαρούμενο πρόσωπο) ένας κερδισμένος και *(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)* ένας χαμένος. Δυστυχώς τις περισσότερες φορές ο χαμένος είναι ο Μαρίνος και πώς να μην είναι δηλαδή;

Αυτοί είναι πολλοί *(εμφανίζεται στο μάτριξ το μοτίβο εκφοβιστές)* και αυτός είναι ένας *(εμφανίζεται στο μάτριξ το μοτίβο Μαρίνος)*. Αυτοί είναι μεγάλοι *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινη κάθετη γραμμή)* και αυτός είναι μικρός *(εμφανίζεται στο μάτριξ το μοτίβο μπλε τελεία)*. Αυτοί είναι

δυνατοί *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινο μάτριξ)* κι αυτός είναι φοβισμένος*(εμφανίζεται στο μάτριξ το μοτίβο μπλε βροχή)*. Νομίζουν ότι είναι ανίκητοι *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινο μάτριξ)*. Νομίζουν ότι είναι ατρόμητοι *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινο μάτριξ)*.

Μόλις τους βλέπει νιώθει κατευθείαν το στομάχι του να σφίγγεται *(εμφανίζεται στο μάτριξ το μοτίβο splash)* και το αίμα του να παγώνει *(εμφανίζεται στο μάτριξ το μοτίβο μπλε χέρια)*.

Όταν πάει σπίτι δεν μιλάει σε κανένα *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινη αλυσίδα στο λαιμό)*. Ανεβαίνει τρέχοντας τις σκάλες και κλείνεται στο δωμάτιό του … νιώθει ντροπιασμένος.. δεν θέλει να το πει σε κανέναν *(εμφανίζεται στο μάτριξ το μοτίβο κόκκινη αλυσίδα στο λαιμό)*, δεν θέλει να το μάθουν οι γονείς του, ούτε οι δάσκαλοί του. Ποιος θα πιστέψει ότι όλα αυτά είναι αλήθεια *(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)*; κι αν το μάθουν οι άλλοι οι μεγάλοι *(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)*; Ποιος ξέρει τι μπορεί να του κάνουν *(εμφανίζεται στο μάτριξ το μοτίβο μπλε βροχή)*; το έχει μοιραστεί μόνο μαζί μου, γιατί ξέρει ότι …. είμαι απλά ένα γέρικο δέντρο… *(εμφανίζεται στο μάτριξ το μοτίβο δέντρο)*. Σε ποιον θα μπορούσε άλλωστε να μιλήσει ένα γέρικο δέντρο; …. Τα δέντρα δεν ακούνε *(εμφανίζεται στο μάτριξ το μοτίβο δέντρο)*. … πόσο μάλλον δεν μιλάνε *(εμφανίζεται στο μάτριξ το κόκκινη αλυσίδα)*….Δεν νομίζεις ότι πρέπει κάποια στιγμή όμως να μιλήσει *(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)*; Για πόσο θα αντέξει να νιώθει το στομάχι του σαν πέτρα κάθε φορά που περνά το προαύλιο του σχολείου; Εσύ, πιστεύεις ότι ο εφιάλτης αυτός μπορεί με κάποιο τρόπο να τελειώσει *(εμφανίζεται στο μάτριξ το μοτίβο ερωτηματικό)*.

Επίθεση στο Μαρίνο

(Ακούγεται προειδοποιητικός ήχος ότι υπάρχει κίνδυνος, ενώ παράλληλα ο λαιμός και τα χέρια αναβοσβήνουν κόκκινα, ακολουθεί σιγή στη μπλούζα και στο δωμάτιο)

- *(Εμφανίζεται το μοτίβο δέντρο)* (Εκφοβιστές) Ωχ τι γίνεται εκεί… Μαρίνε τρέξε τρέξε να κρυφτείς αλλού… βρήκαν την κρυψώνα σου και έρχονται … δεν μ'ακούς; σήκω, φύγε!

- *(Εμφανίζεται το μοτίβο εκφοβιστές)* Τι κάνεις εδώ ασχημόφατσα; Κάνεις παρέα στον φίλο σου το παλιόδεντρο; Το ίδιο άχρηστοι είστε!

- (Εμφανίζεται το μοτίβο δέντρο) (Δέντρο) Ο Μαρίνος δεν ξέρει πώς να αντιδράσει...Τον βλέπω...Το σώμα του μουδιάζει *(εμφανίζεται στο μάτριξ όλη η οθόνη μπλε και ανάβουν οι ταινίες μπλε στα χέρια)*και το αίμα του παγώνει. Πονάει η καρδιά του από τη θλίψη *(εμφανίζεται το μοτίβο καρδιά)*. Ακούμπησε τα χέρια σου στην καρδιά, να δεις πόσο δυνατά χτυπάει ... (εμφανίζεται το μοτίβο καρδιά, ενώ παράλληλα ακούγονται οι χτύποι). Μπορείς να το αισθανθείς; Χτυπάει δυνατά, σαν να θέλει να του πει κάτι. Ο φίλος μας κλείνει τα μάτια του και προσπαθεί να καταλάβει…

- *(Εμφανίζεται το μοτίβο δέντρο να αναβοσβήνει και παραμένει αναμμένο για κάποια δευτερόλεπτα)* (Δέντρο) Όχι Μαρίνε, μην τους ακούς! Είσαι φίλος μου, σε αγαπάω… και.. σε

θαυμάζω! Σε θαυμάζω για την δύναμη και την υπομονή που έχεις.. Σε θαυμάζω για την καθαρή ψυχή και τα γκολ που σκοράρεις στο ποδόσφαιρο! Μπορεί να μην το καταλαβαίνεις, αλλά εγώ είμαι εδώ για εσένα… όπως είμαι για κάθε παιδί… η αγκαλιά μου πάντα είναι ανοιχτή για να γαληνέψει τον πόνο σου…. όμως …. κάνε μου μια χάρη…. ΜΙΛΑ! *(εμφανίζεται το μοτίβο κόκκινη αλυσίδα)* ΜΙΛΑ στο δάσκαλο, ΜΙΛΑ στη μητέρα σου… δείξε τους ότι δεν φοβάσαι! Το πρόβλημα δεν είσαι εσύ… Αγάπα τον εαυτό σου… και …. ΜΙΛΑ επιτέλους!

Ο Μαρίνος αντιδρά για πρώτη φορά

- *(Εμφανίζεται το μοτίβο Μαρίνος)* (Μαρίνος) Αρκετά… *(εμφανίζεται το μοτίβο η αλυσίδα σπάει, ενώ παράλληλα ακούγεται ο ήχος από αλυσίδα που σπάει)*! Σταματήστε πια αυτό το παιχνίδι!

- *(Εμφανίζεται το μοτίβο εκφοβιστές)*(Εκφοβιστές) Α, ναι; Τι θα μας κάνεις;Είσαι και θα είσαι πάντα μόνος ασχημόφατσα!

- *(Εμφανίζεται το μοτίβο Μαρίνος)* (Μαρίνος) Δεν σας φοβάμαι… και όχι δεν είμαι μόνος!Ποτέ δεν ήμουν… το λάθος μου ήταν ότι δεν μιλούσα… ως εδώ όμως ήρθε η στιγμή! Το παιχνίδι σας δεν είναι καθόλου ωραίο… αντίθετα το βρίσκω χαζό να γελάτε όταν βλέπετε άλλους να στενοχωριούνται… Δεν σε φοβάμαι πια..ούτε εσένα Γιώργο, ούτε κανέναν από την παρέα σου…Πώς θα ένιωθες εσύ εάν ήσουν στη θέση μου αυτή τη στιγμή (εμφανίζεται το μοτίβο ερωτηματικό); Πώς θα ένιωθες εάν σε έριχναν στις λάσπες (εμφανίζεται το μοτίβο ερωτηματικό); Πώς θα ένιωθες εάν έδιωχναν όλους τους φίλους σου από κοντά σου και έμενες μόνος στα διαλείμματα (εμφανίζεται το μοτίβο ερωτηματικό); Θα γελούσες τότε;

(Ακούγονται χειροκροτήματα από τα υπόλοιπα παιδιά)

- (Εμφανίζεται το μοτίβο δέντρο) (Δέντρο)Πες τα Χρυσόστομε! Επιτέλους, μπράβο αγόρι μου! Αυτή τη φορά τα χειροκροτήματα δεν είναι για τα γκολ, αλλά για το θάρρος που βρήκε ο Μαρίνος να αντιμετωπίσει τον μεγαλύτερό του φόβο! Ο Γιώργος και οι φίλοι του ντροπιασμένοι κατέβασαν το κεφάλι και έκαναν τρία βήματα πίσω… και τελικά απομακρύνθηκαν. Θαύμα! Ίσως όμως και … να μην ήταν θαύμα τελικά. Ίσως απλά τα παιδιά που φοβούνται να μιλήσουν θέλουν κάποιον να πιστέψει σε αυτούς, έναν φίλο που θα τα βοηθήσει να ξυπνήσουν από τον εφιάλτη που ζουν. Μα τι λέω; τα παιδιά δεν μπορούν να ακούσουν ένα δέντρο! Ή μήπως μπορούν;

Ο εκφοβιστής

- *(Εμφανίζεται το μοτίβο κουκουβάγια)* (Κουκουβάγια) Φτάνουν οι ερωτήσεις πια, ένα γέρικο δέντρο είσαι όχι φιλόσοφος! Εγώ είμαι η σοφή κουκουβάγια της παρέας… Τι ήθελα να πω ; τόσο πολύ που μιλάς βρε παιδάκι μου….. Α, ναι! Μετά από αυτό, ο Μαρίνος αποφάσισε ότι ήθελε να ενημερώσει τα παιδιά του σχολείου για τον σχολικό εκφοβισμό, γιατί ήταν σίγουρος ότι δεν ήταν ο μόνος που ζούσε αυτόν τον εφιάλτη… Και δεν σας είπα ακόμα και τα καλά νέα! Η δασκάλα μίλησε με τον Γιώργο και την παρέα του… και φάνηκε ότι μετάνιωσαν για όλο το

κακό που έκαναν στον Μαρίνο… μάλιστα τώρα θα τους δεις όλους μαζί να μιλάνε για τον εκφοβισμό…

- *(Εμφανίζεται το μοτίβο εκφοβιστές)* (Εκφοβιστές) Πριν λίγο καιρό κορόιδευα *(εμφανίζεται το μοτίβο ΧΑΧΑ)* και φόβιζα παιδιά… αλλά τελικά κατάλαβα ότι ήταν μεγάλο λάθος. Έχω δεχθεί εκφοβισμό στο παρελθόν , αλλά και έχω εκφοβίσει *(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)*… αλλά για να πω την αλήθεια.. τις πιο πολλές φορές έχω εκφοβίσει*(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)*..γιατί για εμένα αυτός ήταν ο μόνος τρόπος να αποκτήσω δύναμη*(εμφανίζεται το μοτίβο κόκκινο μάτριξ)* … Επίτηδες κορόιδευα τους άλλους . Ήθελα να τους κάνω να αισθάνονται πιο λυπημένοι από εμένα *(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)*… μόνο έτσι θα ήμουν εγώ ο πιο χαρούμενος από όλους… και ξέρω… αυτό ακούγεται τελείως χαζό...Αλλά εκείνη τη στιγμή δεν το καταλαβαίνεις. Αυτό πίστευα τότε… όμως όταν ο Μαρίνος μου έκανε εκείνη την ερώτηση…

- *(Εμφανίζεται το μοτίβο Μαρίνος)* (Μαρίνος) Πώς θα ένιωθες εάν έδιωχναν όλους τους φίλους σου από κοντά σου και έμενες μόνος στα διαλείμματα; Θα γελούσες τότε;

- *(Εμφανίζεται το μοτίβο εκφοβιστές)* (Εκφοβιστές)... άρχισα να σκέφτομαι… γιατί κάνω στους άλλους αυτό που δεν θέλω να μου κάνουν;...τότε έφυγα τρέχοντας.. γιατί *(εμφανίζεται το μοτίβο λυπημένο πρόσωπο)* ντράπηκα τόσο πολύ…και μετάνιωσα για όλα…

- (Εκφοβιστής 2) Κι εγώ μετάνιωσα για όλα...γνωρίζω ότι έχω αφήσει πληγές σε πολλούς *(εμφανίζεται το μοτίβο x στο μάτριξ)*….Στο παρελθόν το μόνο που με έκανε χαρούμενο ήταν να βλέπω τα άλλα παιδιά δυστυχισμένα… γιατί; … γιατί δεν ήξερα πόσο ευτυχισμένος μπορείς να νιώσεις όταν βοηθάς και μοιράζεσαι χαρούμενες στιγμές και αγάπη με τους άλλους…*(Ακούγεται χαρούμενος ήχος όμορφης μεταμόρφωσης, ενώ παράλληλα εμφανίζεται ουράνιο τόξο που ξεκινάει από το δεξί χέρι, σχηματίζεται στο μάτριξ και ολοκληρώνεται στο αριστερό χέρι)*. Ακούμπησε τα χέρια στην καρδιά *(εμφανίζεται το μοτίβο καρδιά, ενώ παράλληλα ακούγονται οι χτύποι)* και θα νιώσεις τη δύναμη που κρύβει η αγάπη...Εσύ θες να νιώθεις αυτή την ευτυχία *(εμφανίζεται το μοτίβο λευκό χαμόγελο)*;

The Questionnaire

Code: _____   Girl/Boy   Age: _____

1a) Have you ever been bullied?				Yes	No
1b)Have you ever bullied anyone?				Yes	No
1c)How possible is it to bully someone in the future?	**Not at all**	**Very little**	**Somewhat**	**To a great extent**	
1d)Have you ever witnessed someone being bullied?				Yes	No

2)Wearing the e-textile :

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree
2a)helped me to imagine that I am **part of the story**.	1.	2.	3.	4.	5.
2b) helped me to **understand the story**.	1.	2.	3.	4.	5.
2c) helped me to **concentrate** on the story.	1.	2.	3.	4.	5.
2d) evoked emotions and feelings about the characters.	1.	2.	3.	4.	5.
2e) I would like **to use the e-textile in the future** while I listen to a story.	1.	2.	3.	4.	5.
2f) My experience would not be that good without the use of the **e-textile.**	1.	2.	3.	4.	5.

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree
4) Which of the variables below do you think made your experience in the room **more interesting**:					
♦ **a)**The e-textile	1.	2.	3.	4.	5.
♦ **b)** The sound effects	1.	2.	3.	4.	5.
♦ **c)**The voice of the characters	1.	2.	3.	4.	5.
♦ **d)**The story	1.	2.	3.	4.	5.
♦ **e)**The darkroom	1.	2.	3.	4.	5.
♦ **f)**When the narrator was asking questions	1.	2.	3.	4.	5.
♦ **g)**When the narrator was asking you to move parts of your body	1.	2.	3.	4.	5.
5) Circle the extent of **interest** you felt in the stages below:					
	1.Not interested at all	2. Slightly interested	3.Moderately interested	4.Very interested	5.extremely interested
a)The tree introduces the story time and place.	1.	2.	3.	4.	5.
b)Marinos is being bullied in the school playground while he is playing football with his friend.	1.	2.	3.	4.	5.
c)When Marinos sits under the tree, the bullies find him again, and they laugh at him.	1.	2.	3.	4.	5.
d)Marinos speaks out for the first time against the bullies.	1.	2.	3.	4.	5.

	1.	2.	3.	4.	5.
e)The bullies change their minds, decide to become friends with everyone in the school and regret their past behaviour.	1.	2.	3.	4.	5.

6) Circle the extent of **tiredness** you felt in the stages below:

	1.Extremely tired	2. Very tired	3.Moderately tired	4.Slightly tired	5. Not tired at all
a) The tree introduces the story time and place.	1.	2.	3.	4.	5.
b)Marinos is being bullied in the school playground while he is playing football with his friend.	1.	2.	3.	4.	5.
c)When Marinos sits under the tree, the bullies find him again, and they laugh at him.	1.	2.	3.	4.	5.
d)Marinos speaks out for the first time against the bullies.	1.	2.	3.	4.	5.
e)The bullies change their minds, decide to become friends with everyone in the school and regret their past behaviour.	1.	2.	3.	4.	5.

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree
7a) The experience with the wearable changed the way I think about or deal with bullying.	1.	2.	3.	4.	5.
7b) After my experience with the wearable,, **it is more unlikely to bully someone.**	1.	2.	3.	4.	5.
7c) After my experience with the wearable **if I witness someone being bullied, I will help them.**	1.	2.	3.	4.	5.
7d) After my experience with the wearable, before I act, **I will think of about how my behaviour will influence other people.**	1.	2.	3.	4.	5.

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree
8a) The shape of the **heart** on the e-textile helped me understand that Marinos' heart beat increases because of running or the fear he was experiencing during break time at school.	1.	2.	3.	4.	5.
8b) The **red line** was underlining that the bullies were bigger than Marinos.	1.	2.	3.	4.	5.
9a) The shape of the **tree** on the e-textile helped me understand that the tree is talking.	1.	2.	3.	4.	5.
9b) The shape of the **owl** helped me understand that the owl is talking.	1.	2.	3.	4.	5.
10a) The **right** and **left arrows** on the e-textile made more intense the moment of Marinos looking to the right and left side in order to make sure he is safe.	1.	2.	3.	4.	5.
10b) The **red hands,** in combination with the **X** on the e-textile, made more intense the feeling of rejection that Marinos was receiving from his peers.	1.	2.	3.	4.	5.
11a) The **absence of light** at the beginning of the story, attracted my interest to find out who the narrator is and where the story takes place.	1.	2.	3.	4.	5.
11b) The **absence of light** in the middle of the story gave me some time to think about the characters' situation.	1.	2.	3.	4.	5.

	1.	2.	3.	4.	5.
12a) The **red colour** on the e-textile was representing power, aggressiveness, and pain.	1.	2.	3.	4.	5.
12b) The **blue colour** on the e-textile was representing fear.	1.	2.	3.	4.	5.
13a) The **chain** around the neck was underlining that the characters were not able to speak out.	1.	2.	3.	4.	5.
13b) The **breaking chain** around the neck underlined that Marinos' spoke out and supported himself against the bullies.	1.	2.	3.	4.	5.

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree
14c) The mirror helped me to **concentrate on the story.**	1.	2.	3.	4.	5.
14e) The **darkness** in the room helped me to imagine that **I am part of the story.**	1.	2.	3.	4.	5.
14f) The darkness in the room did not make me **feel scared**.	1.	2.	3.	4.	5.
14g) The darkness in the room helped me to **concentrate on the story.**	1.	2.	3.	4.	5.

	1.strongly disagree	2. disagree	3.neither agree or disagree	4. agree	5. strongly agree	comments
15a) By wearing the e-textile, it helped me imagine what Marinos was thinking.						
15b) By looking at the visuals (LEDs) on the mirror, it helped me predict how the characters will react or feel in the story.						
15c) By listening to the characters' voices in the narrative, I could tell if Marinos was happy or not by the tone of his voice.						
16a) It made me sad to listen that Marinos could not find anyone to play with.						
16b) When his peers were attacking Marinos, it made me feel sad.						
16c) I got upset when I heard Marinos being hurt.						
16d) It upset me when Marinos was being laughed at.						
16e) By wearing the e-textile, it made me feel how Marinos was feeling.						

Interview questions

I1. Was the e-textile important in the narration? Why?

I2. What were the most intense moments while you were wearing the e-textile and listening to the story?

I3. What emotions did the e-textile evoke?

I4. Would you like to participate again in a similar project in the future? Why?