STELA DIGITAL STORIES PORTFOLIO

Intellectual Output IO3
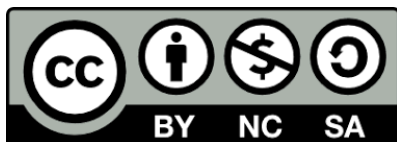
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Storytelling in education: development and methodologies based on contemporary theories of learning - parameters that affect application

Stories and traditional storytelling

According to Strahovnik et al. (2009, p. 3), a story is (emphasis added):

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

Regarding predicaments, they have been with dealt by humans through stories and tales, with the introduction of heroes who experience similar situations as the audience at the given time. In that way, people learn how to deal with and surpass their problems. Gallie (2001) elaborates on the meaning of predicament (as stated in Strahovnik et al., 2009, p. 3) (emphasis added):

> "The predicament is usually sustained and developed in various ways that bring out its significance for the main characters. ***Whether or not the main characters respond successfully to the predicament,*** their response to it, and the effects of their response upon the other people concerned, bring the story to within sight of its conclusion".

Concerning the definition of storytelling as a practice, according to the National Storytelling Network, storytelling is (emphasis added):

> "The ***interactive*** art of using ***words*** and ***actions*** to reveal the elements and **images** of a story while encouraging the ***listener's imagination***".

Various authors consider different most important characteristics of storytelling. Lugmayr et al. (2017) refer to the following: narrative flow, time–space, structure, characters, plot, content, interactivity, and cause–effect. In Figure 1, predicament has been added to the eight mentioned by these authors.

Figure 1 *Basic characteristics of storytelling (adjusted from Lugmayr et al., 2017).*
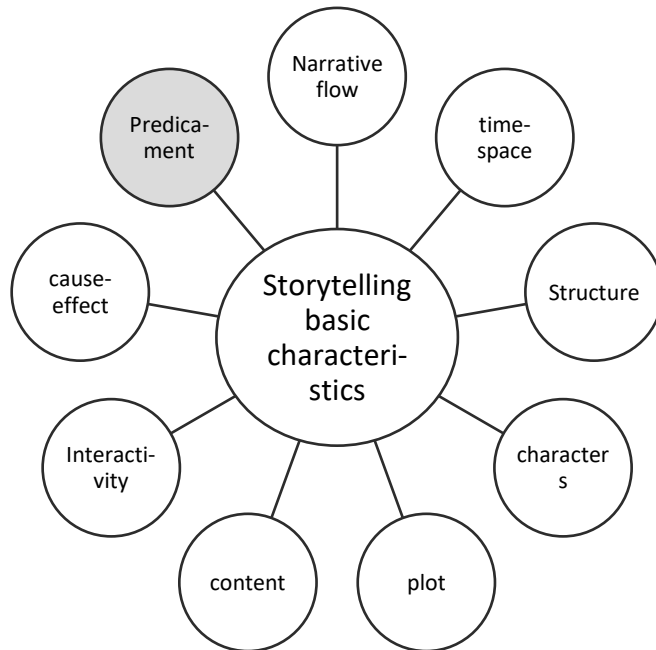
Stories have a cognitive dimension and an affective dimension. Emotions refer to "a feeling and its distinctive thoughts, psychological and biological states and range of propensities to act" (Goleman, 1995, Appendix A). The emotional intelligence is very important and can be defined as "the combination of cognitive, affective and conative domains that enable the intellect to turn into action and accomplishment" (Kumar, 2013, p. 1). In such a way, stories make abstract concepts more concrete and understandable (Robin, 2008).

Concerning the type of narratives that can be used in stories, according to Robin (2006) these can be:

- Stories that are personal and include aspects of significant incidents in a person's life.
- Historical documentaries that examine dramatic events that assist humans understand the past.
- Stories that inform or instruct the listener on a particular concept or practice.

Traditionally, some characters used in stories and storytelling might be larger-than-life (Craig et al., 2001). In any case, attention should be drawn to the structure of the story. As for today's storytelling, that can be digital, storytelling can be associated with game playing.

Digital storytelling in education

Digital storytelling in education is a way of using "new technologies for education" (Yasar-Akyar, 2022, p. 94), in a multimodal way. Its' purpose is to align technology with meaningful context for learning, in a "meaningful technology-integrated approach" (Sadik, 2008, title of the article).

A definition of digital storytelling, as stated by Bratitsis & Ziannas (2015, p. 233) is:

> "The combination of traditional, oral narration with multimedia and communication tools" (Lathem, 2015), "including images, text, video clips, audio narration and music to tell a short story on a particular topic or theme" (Robin & McNeil, 2012).

In education, an interactive digital story is a means of teaching intervention and a supplementary powerful learning tool (Riga et al. 2021) since stories allow deeper understanding of abstract issues and notions. According to Baron-Cohen (2001), these stories provide children with story frames supports and facilitate engagement by allowing experiencing, rather than training in the form of tutorial instruction, and they are often used with station-teaching strategies.

Curriculum adaptations, based on linguistic simplification/structuring and the provision of multimodal information, fulfills one of the fundamental principles of the Salamanca Statement (United Nations, 1994), namely that students with and without disability should be learning together, possibly owing to especially designed software that can counterbalance lack of skills. Thus, digital storytelling becomes a framework to analyze and highlight the importance of context and strengths of the student, as opposed to focusing on the disability condition. Digital storytelling can help turn what at first is seen as a deficit or a challenging behavior into "building blocks for the class to use in a collective, creative process" (O'Neill).

iPads having been "traditionally" used as a support tool for this scope, with the holistic procedure allowing knowledge remixing, sharing of knowledge and stories, and interacting with them (Smeda et al., 2012).

An important notion is also the evolution of a story-centered curriculum in education, especially during early years inclusive education. In this context, students are challenged by authentic situations that are specifically designed to motivate them to apply knowledge and learn new skills of a curriculum in which all students deserve to participate (O'Neill). Emphasis is generally given on the importance of children's active roles as participants and developers, the empowerment of children's strengths and creativity, and the modifiability and transformability of technology solutions. According to Robin (2016), digital storytelling capitalizes on the creative talents of students, who can start to take control of their

learning, while behaving better in class, having increased self-confidence, and displaying greater interest in the subjects they are learning.

Lugmayr et al. (2017) argue that Web 2.0 based stories can be stored or published on the internet, allowing people to review, critique and discuss upon them, thus enhancing their educational value and their sustainable use. They also consider the feasibility of self-evaluation through a cloud-based system of storytelling that allows students to assess their experience in comparison with previously made experiences of stories. Lastly, they mention 3D digital narratives that integrate education, entertainment and social commitment.

At this point, it is important to consider some of Lugmayr et al. (2017) comments on what digital storytelling is, and what it is not:

Figure 2 *What digital storytelling is and what it is not (adapted from Lugmayr et al., 2017)*

It is about creating meaning

not about creating media

It is about contributing and collaborating

not only about telling a story

It is about sharing and connecting

not about telling an isolated story

It is about the amplification of knowledge

not only about the transfer of knowledge

it is about transforming stories

not about substituting analog stories

Craig et al. (2001) attest that, as the pedagogies for values and priorities in education can be ambiguous and lack clear guidelines, it is largely incumbent on teachers' views, backgrounds, and pedagogical dispositions to instigate effective teaching and learning in this area. At this point, it is crucial to consider some of the needs of the teachers using digital learning, that need to be taken into consideration.

The teacher who uses digital story telling

Needs of the teacher who uses digital storytelling

Nowadays, teachers need to be prepared to work with an increasingly diverse student population, where difference (cultural, social, or concerning disabilities) is a normal and expected reality within the whole spectrum of education, and a resource of knowledge.

For that purpose, teachers need continuing professional development opportunities, which are even more important for mid-career teachers (Yasar-Akyar, 2016). Some of them need to be trained in the use of emerging technologies, in the frame of a broad stakeholder dialogue. The teachers' understanding of these concepts is very important, so that they decide to pursue the enhancement of their professional development concerning the promotion of inclusive education. They need systems that they consider usable, thus, step-by-step and short workshop-based trainings is suggested as an excellent educational strategy for that purpose.

This training strategy can be enhanced with the establishment of trust while telling inclusion-related personal stories in small groups. Work-related stories are also deemed important since the work environment is part of their daily knowledge and allows for dialogic interactions and identification with other people's stories. For this kind of training events, efficient tools and facilitators are very important, so that teachers can see the development of their knowledge, consider new technologies "nourishing" and capable of building meaningful learning and increasing awareness.

Digital storytelling can be a way of enjoyment of expressing, listening and learning, also for the teachers. It can be a driving change for the creation of more inclusive environments, subsequent to the development of the teachers' emotional intelligence. According to research conducted by Yasar-Akyar (2016), all the teachers (secondary education) were optimistic about the digital storytelling practice.

For that purpose, teachers need to become aware of their knowledge deficits in a safe environment and gain the capacity to act purposefully and constructively to direct their professional growth and contribute to the growth of their students and colleagues. At the same time, they should remember that due to the social elements inherent in narrative formation, there is a possibility that some children will not be willing to attend to or engage with it, so, this course will be challenging. Certainly, during this course, they also need help to solve technical problems that may arise.

Most importantly though, teachers need to "willingly renounce" their practices in terms of classroom procedures, student grouping, assessment and teaching, and to adopt recent teaching techniques. They also need to commit to school/community transformations and to strategies of difference-based pedagogy and organizational structures (Ioannidi, 2020).

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According to Michalski et al. (2005), when working also with children with developmental disabilities, adaptations for storytelling need to be more extensive. These adaptations concern mainly input, output, time, and level of support. The teacher needs to orchestrate these activities, thus, they should be willing to invest significant amounts of time, with the creation of detailed plans, entailing flexibility and creative problem solving. Most importantly, they need to invest a great amount of energy, so that they and their students are able to reap the fruits of their effort. The above mean that there is also a need to respond to teachers' longstanding reports that feel challenged in developing curriculum and accommodations for children with disabilities. Expectations for teachers to embed and foster values without adequate guidance makes their role in this process is ambiguous and overburdens them.

Tyrrell & Logan (2017, p. 57) as stated in Gross (2013) remind that "however busy we are, we need to carve out time to talk" and thus remind the need for communication between colleagues and having examples of best practices from them.

Practical suggestions for the teacher who uses digital storytelling

According to Craig et al. (2001), a teacher should, in any case, need to recognize the linguistic diversity present in their classroom, and demonstrate extremely clear pronoun usage in relevant dialogues, to make clear who has said or done what. Also, the teacher should remember that it is important to explore all narrative forms, while students become acquainted with the rules associated with each of them. In addition, they ought to remember that they are a model for their students during observational learning and it is important to even let children "overhear" their thoughts. Also, they need to supply the children with a suitable platform, other resources (digital or not) and dialogues when necessary.

As O'Neil has stated, a challenging suggestion is to look at anything a student has to say, does, or brings to a situation, as an "offer", since, in the context of early childhood classroom, it is advisable for the teacher to consider anything anyone says or does as an offer, on which the class can build meanings. These offers could be children's uninvited offers, invited offers that fit the teachers' expectations, or invited offers that don't fit the teachers' expectations. The challenge is to always say "Yes", or "And" (Figure x).

Furthermore, also according to O'Neil, asking students what they think about a probability can be very powerful, when incorporating the children's ideas without necessarily altering the outcome or plot of the story. Also, an invitation for repetition of things being said is very motivates students who need to be more encouraged in order to participate.

To complete this section, it is important to point to some of Craig et al. (2001) suggestions on questions that a teacher using storytelling can ask themselves. These can be seen in Figure 4 (blue colour), to which we have also added a few elements concerning specifically digital storytelling (green colour) (see also Figure 2).

Figure 3 *Questions a teacher might ask themselves concerning their storytelling practices (adjusted from Craig et al., 2001).*

Are my students attentive and involved?	Which kinds of stories do I feel more comfortable with, and why? How about my students?	Are my students learning to ask what, when, who, and why questions?
How many of my students seem to enjoy changing stories around?	Are my students able to adapt stories to the needs of various audiences?	Can my students explain why various people have different perspectives?
Are my students able to talk about feelings of being misunderstood?	Are my students able to access digital media allowing them to practice storytelling?	Do I always remember that technology is only an element of digital storytelling?

Auxiliary educational materials and methods

Since technology does not exhaust all necessary material (let alone teaching strategies) for a successful storytelling experience, other materials are also necessary for the discussions that are related to this teaching tool.

- Photographic visuals that incorporate topics and objects of interest to the child can be used after being photographed or scanned, as well as illustrated books and plastic figures (e.g., of animals) can be used as visual material (Bratitsis & Ziannas, 2015).
- It needs to be stressed that pictorial records encourage children with language difficulties to "reminisce" about shared school events and a variety of materials can be used for that purpose(Gross, 2013, as stated in Bratitsis & Ziannas, 2015).
- Other activities, such as role-playing experiential games (e.g. "Do as I do", "The mirror of emotions") and painting in combination can be used (Bratitsis & Ziannas, 2015), with "show and tell" being another potential method.

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- The teacher should collaborate with the families and find out some kinds of things each child likes at home is responsible for at home and ask for the respective photographs, before giving specific assignments (Michalski et al., 2005).

Pedagogical implications concerning digital storytelling in Education

Digital storytelling supports all learners rather than "most and some" (Florian, 2007) and promotes the need for accepting each other's uniqueness with no barriers. Children and teachers are assisted to understand that all these differences are just "things of life" (Yasar-Akyar et al., 2022). Diversity of stories can also be considered an essential characteristic that allows participants to increase awareness about inclusive education, where children become learners with active, respectful, and critical perspective. Trust built is possible, through working in a space where they can collaborate, share obligations and gain various understandings in a safe environment, and get inspired to improve their practices and grow, without feeling insufficient. Also, digital storytelling is indicated for both individual and group intervention, under the condition of some practical guidance by a coordinator.

There is also an opportunity to use content highly adjustable to the context of the situation and the preferences of the children, where the uniqueness of each person is celebrated. Digital story creation makes a course fun and attractive as it increases participation (allowing for more entry points), motivation and interaction, and provides better learning and permanence of knowledge and empowerment (O'Neil). Some children specifically prefer technology-based tasks, and this should be taken into consideration for the completion of activities. Thus, according to Chen & McGrath (2003), retaining individuals' engagement in a task, while working on a specific learning skill, is more feasible.

Peer learning is definitely a sought-out option, since in this condition, children are becoming effective co-agents. Thus, learning becomes interactive, in a constructivist environment of collective knowledge construction is possible, that is based on children's prior knowledge. This is extremely important for students with different levels of skills, who also have the chance to become active learners and creators of memorable learning experiences, rather than passive consumers (Kieler, 2010).

The above-mentioned opportunity is given by the diversity of formats used, multimodal communication, and the opportunity to publish the created stories and share final versions of the story that others can alter according to their needs. In fact, the use of story circles and digital processes like sound and image merging constitute active promotion of mechanisms that promote dialogue, that, according to Yasar-Akyar et al. (2022) can trigger students' affective centres of the brain.

Also, according to Bratitsis & Ziannas (2015), in digital storytelling, children make use of the direct visual (or through other senses) feedback of their choices. This constitutes a tool for a constructivist approach

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in knowledge building and also reflection that is highly effective and provides an ongoing focal point that facilitates the child consider proper behaviour and make connections with real experiences.

In addition, digital story telling offers personal evolution through self-regulation, promotes competences, and allows explaining or practicing specific topics in a way that is more enthralling (Hume & Reynolds, 2010). It also promotes child self-initiatives that are likely to trigger radical and widespread changes in behavior, whereas Koegel (1999) attests that it can have a positive impact on areas such as memory and attention span. Craig et al. (2001) also note that during storytelling (in general) children should be provided with frequent opportunities to give details in the story that relate to their own life or try to interpret character's reasons for doing what they did.

It should be noted that the stories that involve responding to narrative inference questions and those that require cause-and effect relationships are more demanding. Also, the number of children for a storytelling session is important, in order to have learning outcomes that are high in number and quality.

Process of digital storytelling in Education

The following steps apply when the students are going to participate in the corresponding step of the process. Otherwise, the teacher can adjust accordingly. In any case, the teacher ought to adopt a scaffolding and gradual approach, providing proof of the level of achievement, so that students can progress smoothly through the various stages and gradually take more responsibility within a series of lessons. Also, the teacher should devote sufficient time to initial planning and drafting before progressing onto revision and publication.

Creating the story

- The teacher sets some ground rules (Yasar-Akyar et al., 2022).
- The central idea of the narrative is chosen.
    - This could be a means of combining content area knowledge with social awareness (Gunawardena & Brown, 2021). The use of authentic problem cases that need to be solved by students is highly preferred. Nevertheless, these stories could be stories that really happened, make-believe stories, stories a family member has told them, or funny stories about a sibling or friend (Craig et al., 2001).
    - The students can also create different versions of the same story (Craig et al., 2001).
    - One of the above-mentioned ground rules might be the choice of the central idea by the teacher, otherwise, the students may be the ones who will select the central idea. In any case, the topic should be of interest to the students, providing stimulus for initial engagement (Kieler, 2010).

- Students, being assisted by the teacher (as in all steps), plan the narrative (which might or might not have been selected by them) by organizing it using pictures.
  - The narration can be first person narrative (Robin, 2016).
  - The teacher needs to provide a format for students to put their thoughts together, visually or aurally, and also kinesthetically (Michalski et al., 2015).
  - The narrative can be organized initially with the use of pen and paper storyboard (Figure 5), or the use of a drag-and-drop software and timeline (Robin, 2016). In any case, a summary web (Figure 6) or graphic organizer is considered necessary. A storyboard is "a written or a graphical overview of all the elements you plan to include in the digital story. It serves as a blueprint or an advanced organizer as you plan to construct your digital story. Storyboards can help you visualize your story before it is created when it is easier to make changes or add new content" (Robin, 2016, p. 24).
  - Use of a graphic organizer for the generation of ideas in the beginning of the writing process, such as Cosner's Formula Writing, is important (Michalski et al., 2015).
  - The important questions are what, when, who and why (Craig et al., 2001). Verbally describing their photos, as they share them with each other, helps them determine what could be written. These words should be written, and this is the scripting.
  - Information included might be descriptive, directive, perspective, or affirmative (Gray & Garand, 1993).
- Students can also draw their own pictures, including their emotions.
- The children revise what has been written, and that requires learners to provide feedback to their classmates using their interactive functions and decide upon activity choices. Thus, students learn how to interact appropriately with the chosen materials and their classmates. The collaborative nature of the digital storytelling process strengthens students' interest in editing, revising, and expanding their work, in a "community of inquiry" approach (Michalski et al., 2015).

Figure 4 *Storyboard example*

Number of scene:	Title of scene:	Dialogue:
Background: describe or use a picture	(Object$_x$ – describe or use a picture)	Action and feedback: for action 1 or action 2

Figure 5 *Summary web (Michalski et al., 2015).*

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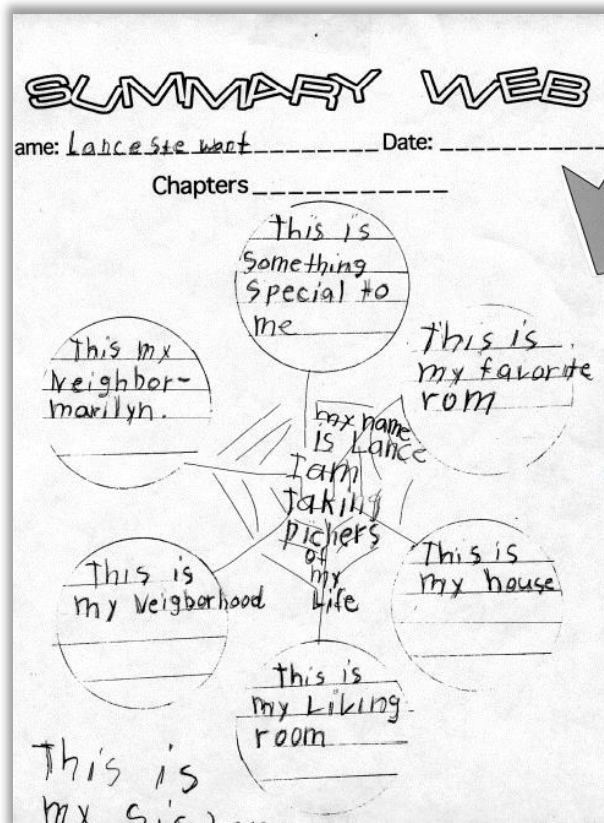
Producing the story

- The children digitize the story elements, meaning that they scan or photograph the images needed, or record short element of dialogue, addressing to what is at that time (according to Craig et al., 2021) a "faceless audience". This process might take several weeks. Since their writing became more public, students are motivated to polish and perfect their speech, by speaking in an appropriate pace and loudly into the microphone (in the case of audio recording) (Michalski et al., 2015).

- They create their own digital visual images, take photographs for their stories, add colors and transitions when using presentation software (Robin, 2016).

- The story, after completion, is uploaded to the teacher's server (Michalski et al., 2015) or produced to a Web 2.0 application (Lee, 2014).

Watching the story

- The children will need to watch and live the story at least twice. Continually revisiting stories is helpful. During that, the teacher can use story probes and do what is called "discussion" (Bratitsis & Ziannas, 2015; Craig et al., 2001).

Discussing the story

- After the first time they watch the storytelling, there must be a more detailed discussion with the children so that they will be able to better understand the specific concept. It is at this stage that the children can reflect upon their choices and their consequences on the evolvement of the story (Bratitsis & Ziannas, 2015).

- The teacher should be allowed to make interruptions while a story is being told and summarize what has been heard or ask a student to do that (Craig et al., 2001).

- The children identify central themes and formulate hypotheses by speculating about outcomes (Craig et al., 2001; Bratitsis & Ziannas, 2015).

- The teacher should ensure that children fully understand a set of events in a meaningful way, in order for them to effectively grasp the connectedness of events within the narrative. The use of images, and actually digital images, provide less complex stimuli than those represented by verbal or facial expressions, and thus are more appropriate for some children (Reid, 2002).

- According to Craig et al. (2001), children should be assisted in paying attention to other student's points of view, concerning maybe exactly the same situation, and conceive the message intended to be transported. In that way, they might end up with a particular point of view that might be different from the initial and possibly the one held by their families. This view might be an emotional one.

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- Children should be encouraged to ask one another questions about the similarities or differences they can identify between their perceptions (Craig et al., 2001).
- Also, depending on the children's needs, the teacher can use drama and role playing to help them express how characters in stories might feel, using their face and body (Craig et al., 2001; Yoon et al., 2016).
- According to Craig et al. (2001), another option is to blindfold children and let them feel different parts of an object. Then, they can be asked to tell a story about what they touched and even talk about how knowing how the parts fit together in a whole can change the evolvement of the story.
- Teachers engage students to analyze experiences (Gunawardena & Brown, 2021).
- The teacher should use circle times for the participation of all children and encourage them to think carefully and build on what has been said before (Bratitsis & Ziannas, 2015).

Presenting the story
- The class might decide that they want to publish and present the story to others (e.g., peers of other class or parents) and thus evaluate their work and start also obtaining a cultural definition of a good story (Craig et al., 2001).
- According to Craig et al. (2001), children should also be encouraged to check out audience understanding and give more explanations, if needed.
- This is the stage where children will be highly motivated and engaged, demonstrating pride (Michalski et al., 2015)

Next steps
- Some children may continue to reflect upon the issue under discussion (Bratitsis & Ziannas, 2015) and it would be useful for the teacher to observe in the future possible differences in children's behavior and expressed stances, during their interactions with their classmates (if the topic of the storytelling could produce such results).
- The children's attention can be attracted during this procedure, and they can be motivated to participate in the next, related and carefully designed activities.
- The class might decide to reconstruct the narrative for different and authentic audiences, or they can be simply encouraged to talk about the very same experience with two different audiences (Craig et al., 2001).

Purposes of digital storytelling use in Education

Digital storytelling in general stimulates cognitive development, facilitates language acquisition, and promotes social interaction, whilst offering enough flexibility. More specifically:

Introduction of social empathy, moral consciousness, ethics and values

General notes on introducing social empathy

It is a fact that children with autism spectrum disorder or other disorders that affect communication and adaptation, need to face their own persistent shortfalls in social perception and cognition in social interaction, since this is often characterized by lack in flexibility regarding their thinking. At the same time, they need to face social exclusion by other members of their environment. This often results in isolation and the enhancement of social difficulties that are already being faced, especially in the case on inclusive classrooms, where children with very diverse skills can meet. Bratitsis & Ziannas (2015) investigated the social skills of 3 to 5 year-old children and considered their research useful for the extrapolation of conclusions about children with disabilities and similar cognitive development. Social cognition and pro-social behavior are associated with empathy and storytelling, as an optimal way to best describe social schemata and situations and provide guidance for socially appropriate attitudes and behaviors.

Storytelling could be a coaching approach for fostering social empathy and at extension, by decoding social concepts and situations, emotional intelligence, with the exploitation of the interactive digital storytelling approach. This is very important also for the children without disabilities since they need to be trained on how to socially interact with persons with disabilities (Bratitsis & Ziannas, 2015). That leads to being able to understand another person's needs and provide help when needed and respond with empathy and prosociality (behaviours that are intended to benefit others), Theory of Mind and emotion understanding. Young children can indeed take part in the suffering of other people, and they should be encouraged to realize that their feelings might be a reaction to something that happened to another person. Thus, mental sensitivity, compassion, solidarity, sympathy, honesty, resilience and respect for others are enhanced. All the above can be practically exhibited in instances such as sharing objects, or even assisting in emergency situations. There is also a positive correlation of students' acquisition of positive values to their level of educational achievement and motivation.

According to Bratitsis & Ziannas (2015), in storytelling of this targeting, the central character (either a child or an animal) is usually presented in a rather unpleasant emotional condition, which can be projected in the social part of their life (this might be school life). They suggested that the reason for the emotional condition be intentionally not mentioned, so that children can identify with the character. In such a case, the listener of the story is prompted to think and decide on two things: 1) Whether they would act and 2) In what way they would act. Thus, depending on the decision they make, the evolvement of the story can be different, creating a nonlinear story.

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According to Bratitsis & Ziannas (2015) and Yoon et al. (2016), levels of emotion recognition and empathic attitudes can be enhanced, with the children being able to:

- Recognize the fundamental emotions of the heroes within the digital story, based on the visual information (illustrations) they were presented with.
- Connect the emotions of the story-characters and the interchange between them with the story plot and the narration evolvement.
- Project themselves on the visual representations and justify their choices in matters of emotions formulating hypotheses about the characters' actions and the possible causes for their emotional state.
- Understand the significance of empathy on a higher level, by connecting their perceptions from the story and the reactions of the characters to their own experiences from their everyday school and family life.
- Provide experiential examples of situations similar to the ones they decoded from the digital story.
- Make evident their emotional background and then and support their decisions and actions.
- Have the chance to collaborate with children without disabilities who can understand what people with disabilities feel, how they perceive behaviors and why they react in specific manners.
- Correlate emotion recognition to behavioral patterns, in an attempt to enhance social interaction and the sense of belonging.
- Develop their curiosity. This "curiosity" assists them in better realizing the consequences of high or low empathic behavior in everyday life.
- Make reasoned ethical decisions informed by core values.
- Though children may have some initial knowledge of responsible behavior, they are assisted to execute them in their play, beginning to find it is important to support children in "social emotional reasoning".
- A sense of belonging is developed, which is highly associated with empathetic feeling. Thus, children can become members of a group and have friends, establishing new social ties at nowaday's schools.

A constructivist proposed pedagogical model for values education

Gunawardena & Brown (2021) have developed a useful framework that can be used with storytelling and reflecting on one's own ethical behavior, values, and actions. This takes effect by giving children the opportunity to understand *themselves* through mirrors and *others* through windows. This is a use of storytelling that influences students' behaviour as opposed to only developing students'

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understanding. In this case, a mirror provides an opportunity for students to reflect on their own behavior and understand how they react to situations. On the other hand, a window provides an opportunity to view someone else's experience (Figure7).

Figure 6 *Mirrors and windows: for reflecting on one's own behavior (mirror) and understanding others (window) (adapted from the framework by Gunawardena & Brown, 2021)*
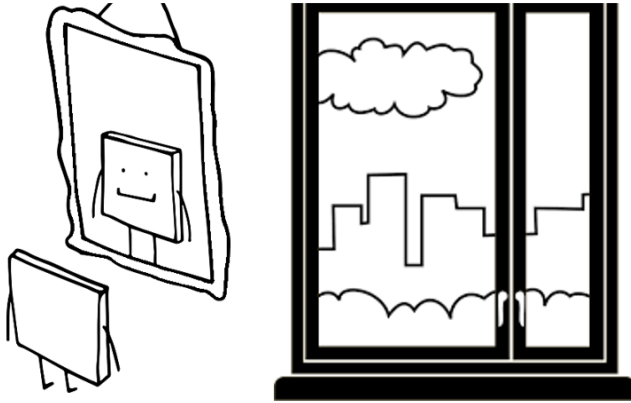
The early years of education are crucial for developing attitudes, self-regulation and a growth mindset, and enhance emotional and social competence, since the class is small society and children need to be morally responsive. There can be commonality and universality in values structures, though they are labelled or interpreted differently by different groups of people. Community values such as respect and tolerance of other viewpoints are important in the context of a pluralist democratic society. Values education in curriculum is complex, and though it can occupy a prominent role, it can be obscured in the given and the hidden curriculum. Gunawardena & Brown (2021) suggest some basic principles when reflecting on one's own behavior. It needs to be remembered that these steps are not necessarily linear or systematic, but occur as students develop their intellectual depth further, with an appropriate action being reflected in real life circumstances.

Figure 7 *Taxonomy of values and authentic storytelling (Gunawardena & Brown, 2021)*
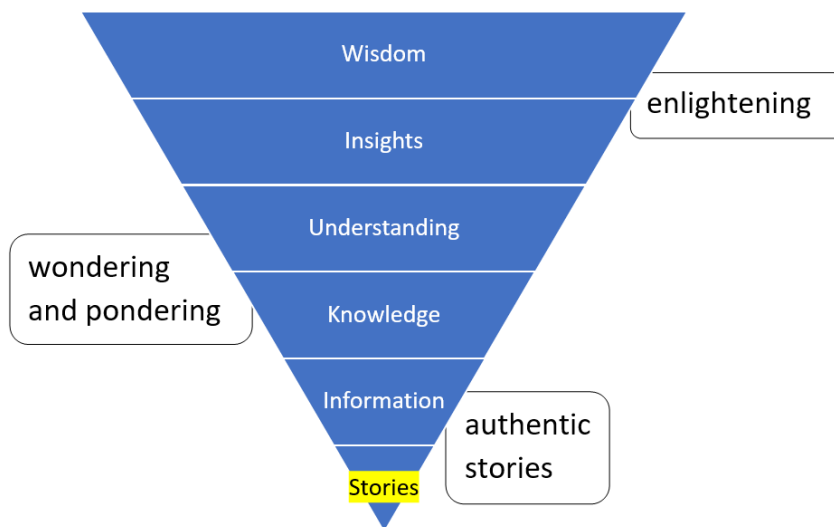
Authenticity

Gunawardena & Brown (2021) attest that storytelling should dramatize real encounters, and perspectives should be challenged. Stories can be intersubjective and at the same time purposeful, in order to encourage children's creativity. Potential trouble spots such as aggression in stories can be used, as well as ways in which storytelling can enhance home-school relationships.

Wondering (questioning and curiosity)

Effective communication requires inter-relational capacity, with discovery of new perspectives and viewpoints. The sequence in which stories are presented along with appropriate prompt questions enables and activates students' executive functioning skills as they are thinking while listening to the stories. Also, the teacher should pause at times, to get students to wonder and give them time for thinking (Gunawardena & Brown, 2021).

Pondering (thinking and reflecting)

Children should have the opportunity to interrogate their own thoughts and the thoughts of others. Also, they should try to translate into their own language what they think of a situation, and discuss with other students to understand their different perspectives and raise questions about situations being faced. Hearing and discussing different perspectives is very important, as this can create broader awareness and empathy. Gunawardena & Brown (2021) emphasize that, especially at this age, the discussion processes need to be directed by a person (teacher).

Enlightening (obtaining a greater knowledge)

This happens when students experience and contextualize the messages in their own eyes and discover that there might be others values more meaningful and long-lasting than what they already thought. Gunawardena & Brown (2021) emphasize that there is a fine line between the effort of teachers to

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explicitly tell the message and students to draw the message for themselves, with teacher scaffolding their thinking

Wisdom (transferring and applying)

A synergy of the elements, such as intellectual depth, inter-relational capacity, and self-reflection are relevant to this, and assist at evaluating the consequences of actions (verbal or physical) that can inflict pain on others or be inflicted by others. Wisdom means for the student to have the strength to be mindful and rational, and at the same time conscious of their personal wellbeing and the wellbeing of others (Gunawardena & Brown, 2021).

Narrative development

Narratives can be personal (e.g., news or pictures or objects to sequence the daily schedule), or narrative (procedural) and entail verbal and non-verbal communication (Craig et al., 2001; Robin, 2016). Some children may have difficulty processing ordinarily presented auditory information and might have a specific language delay (Tyrrell & Logan, 2017). Also, according to Pennington & Delano (2012), they may lack the skill to produce brainstorming ideas, or have limited imaginative development and too much inherent literal thinking. Thus, they are less likely to use the essence of a story to later link it together (Diehl et al., 2006). Moreover, when creating stories, these children may use less content, find it difficult to create complete episodes, and use sentences with short length and weaker cohesion. Their stories might be more related to a topic rather than a main idea (Craig et al., 2001).

Storytelling, nevertheless, is a language to support all thinking and learning and narrative skills development. Photographs and other multimedia use allow children to identify, organize, chronologically sequence, evaluate and select the key points, issues and meanings of a presentation (Diehl et al., 2006). It also promotes the ability to engage with the listener, trying to be an effective communicator and presenter, to retell personal news, sequentially recap a story and show sensitivity to their needs, since communication is a two-way process. In that way, executive functions (Hume & Reynolds, 2010) and correct past tense verb usage (Diehl et al., 2006) are enhanced.

It is also important to give children the opportunity to tell and retell stories and personal and procedural narratives of increasing complexity to familiar and unfamiliar audiences. Recording and playback functions in digital storytelling assist in the development of "a sense of audience". Also, some increased occurrence of on-topic spontaneous conversations has been observed, within collaborative sessions leading to "digital technology reciprocal teaching" (Michalski et al., 2005). As Shields (2006) attests (as stated in Tyrrell & Logan, 2017), "language is not only learned: it grows".

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Through scaffolding that is guaranteed by the teacher, these activities will later promote the skills of structured writing and bridge the gap between book and oral recount. That leads to the production of more extended sentences that are more organized and express less sporadic thoughts, using correct grammar and spelling, and making use of varied and interesting vocabulary. This has also positive results in children's spoken communication. In order to achieve that, stories should be carefully designed so as to "maintain the lexical load they are predetermined to convey".

Family environment

Digital storytelling is a way to involve the family environment, in a controlled and beneficial way and the examples that can be used in digital storytelling might belong to the wider social environment of the children, including their family. Furthermore, close collaboration with family might be necessary for some projects, such as assisting the child in taking a picture of their bedroom (should they agree in such an action) (Michalski et al., 2015). There are possible scenarios for collaboration that entail, e.g., bringing in pictures from home, including projects as "My Home," "My Pet," "My Neighborhood," etc. In any case, there should be a collaborative link with the parents, to ensure that each child is not overloaded with new information. Also, this collaboration increases the probability of similar language usage across different settings such as at home or during other therapies (Petersen et al., 2014).

It is important to underline the fact that a family's discourse style defines the vision of the world that the children obtain. It is important to keep in mind that, in some cultural environments, as Craig et al. (2001) state, stories are organized around specific events, with detail given to the steps leading up to an experience, as well as what occurs after this experience. In other cultural contexts, what is important is a chronicle of relationships. In the former case, place and time are very important, as well as an understanding of how cause and effect work, and these stories manifest particular difficulties that need to be considered.

Other purposes

Digital storytelling has been recorded to be promising or already beneficial also in other cases:

- mathematics (Riga et al., 2021; Robin, 2008)
- science (Robin, 2008)
- **language (Craig et al., 2001)**
- history (Riga et al., 2021)
- arts (Craig et al., 2001; Robin, 2008)
- safety and self-care skills (Riga et al., 2021)
- digital literacy (Riga et al., 2021)

Qualities enhancing education

Activities that serve the aims of teachers for children: with teachers (language, narration, emotional expression, collaboration)

Project aims to enhance the active attitude of all students in listening, interacting and producing narratives, first, by ensuring that story listening, and interaction enhanced by TUI stimulates attention, motivation, engagement and a deeper understanding of the contents. Therefore, elements such as objects, sounds, smells and tastes could help to pay more attention and be deeply involved in history. Secondly, we want to make sure that the enjoyment of TUI-stories also stimulates their production by children, both tangible and digital production, following a constructionist and active learning framework.

The **objectives** that can be pursued through a storytelling activity are manifold, not only but specially in schools:

- Language development: the first objective may be to encourage lexical, phonetic, morphological, syntactic, as well as pragmatic development. Moreover, through the storytelling activity, it is possible to stimulate the development of the non-verbal components of language, that is the set of communicative processes that range from tone of voice, facial mimicry, gestures, gaze, proxemics, and posture.

- Cognitive skills' enhancement: another goal could be the development of story planning, the ability to order sequences of events, the understanding of cause-effect patterns, the memory processes.

- General learning: a lot of contents can be thought through storytelling, starting from school subjects contents, to knowledge of the world, people, objects, behaviours, and also their relationships and interactions.

- Promotion of social skills: during the storytelling activity, participants can learn to interact with peers during the narration.

- Pragmatic competence: pragmatic refers to the narrator's perspective on the events narrated, the context and the ability to make evaluations of these events.

- Imagination, creativity, and divergent thinking development: in narrating, the element of fantasy is crucial. Through storytelling children can invent words, stories, characters and places that increase imagination and creative power. Divergent thinking can be stimulated too, that is, the ability to get out of the box and free oneself from preconceptions.

- Self and emotional expression: to tell a story is an expressive activity itself because it brings out something that is inside the mind and thoughts. In this way, storytelling is an emotional expression tool, since children can bring out the emotions they feel or the emotions that a story arouses. Emotional development is a fundamental component to be promoted from the early childhood years.

All the previous skills are part of the narrative competence. The advantages of introducing the narrative method in the educative practices are known: mostly, storytelling is learning while having fun. Storytelling improves students' learning and creativity. Moreover, through a digital and tangible creation tool information, knowledge, contents, and personal experiences can be manipulated, created and organized in a specific format.

Digital storytelling aspects

Digital storytelling aspects are grouped in story aspects: Plot - the set of events that build up the story; Pacing and Narrative - the rate at which the events are narrated; Dramatic Question - the trigger which opens the main point of the story and moves it forward; Story Characters- characters are the actors, participant, or players that populate the events and scenes of the story; Emotional Content - the range of emotions that the author shares in the story and Learning aspects - purpose educational aims and objectives for the story; language Usage - complexity of language used in the story.

Digital creation aspects consist of Story Content - the digital elements used to create the story; Digital Competence - knowledge of the tools for the creation of a digital story; Production - the process and tools used for finalizing the digital story; Presentation - show the story to the audiences; Digital storytelling benefits - Enhancing student engagement, improving educational outcomes, creating a link between formal and informal learning and creating constructivist learning environments.

Teacher aspect (What teacher should know) present: experiences with digital sound, video, and storytelling; Knowledge of possible strategies of using digital storytelling as a medium for engaging students and improving learning outcomes; Pedagogy skills of the potential power of digital storytelling as a teaching and learning tool to be explored within the constructivist paradigm; Skills to create a digital story with the Project I'M TALES Authoring Tool.

As we already overview the variety of aspects, here is the step-by-step guide of the digital story creation.

STEP 1: Brainstorm - co-creation approach. The objective is to invent the story. Description: Educator creates working group (or groups), assign the learning topics to discuss, share ideas, and brainstorm the story in different ways. The group write down the initial story script for the assigned topic.

STEP 2: Storyboard. The objective is to define the different parts of the story. Description: Educator writes the storyboard to organize the story in sequences. Some further discussions in the team may needed to verify the adherence to the main ideas of the story.

STEP 3: Search the material. The objective is to collect the material needed to create the digital story. Description: Look for images from different sources such as books, magazines, and internet; considering the copyright and digital rights issues related to the selected material; use a digital camera, if needed.

 STEP 4: Creating the digital story. The objective is to use of a digital software (e.g. I'm Tales). Description: This step is designed to help create the digital story and explain how to import pictures and videos into the I'M TALES Authoring Tool. Moreover, educators may record their voice and use it within the story.

STEP 5: Editing and feedback. The objective is to edit and finalize the digital story. Description: This step is designed to assemble the digital story. Here is the last moment to collect feedback and to modify the story before the final version is completed.

STEP 6: Presentation and Evaluation. The objective is to share the digital story and analyze the outcome. Description: Educators presents their final digital story to the colleagues before introducing to pupils. The story will be evaluated based on the story elements, story creation and resentation.

Final considerations: Digital storytelling is a powerful tool for engaging students in deep and meaningful learning; It has the potential to involve students with interactive approach toward learning with the new digital media, exploring the pedagogical benefits of digital storytelling; After the theoretical digital storytelling creation framework, we can pass to the next lessons to focus on specific I'M IN TALES digital storytelling aspects and implementation with the project authoring Tool.

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Suggested resources for further study

- Listen to Professor Angus Fletcher (Professor of Story Science at Ohio State University "Project Narrative") talking about the Science of Storytelling: https://www.youtube.com/watch?v=AK-Efwsc1To
- Find out more about "Project Narrative": https://projectnarrative.osu.edu/
- Listen to Jim Jorstad (award-winning journalist and filmmaker) talking about the way in which digital storytelling can change people, perceptions, and lives: https://www.youtube.com/watch?v=QhJDUIQ9EzY
- Listen to Robert Rubinstein (recognized storyteller and educator) talking about the empowerment of students through storytelling: https://www.youtube.com/watch?v=TZGnxU2wz7w&t=511s
- Listen to Professor Sarah Telfer (Associate Professor of Education at the University of Bolton) talking about innovation, integration and education through storytelling: https://www.youtube.com/watch?v=ZEgyCMr7dNs
- Use some information on basic steps for digital storytelling: https://www.youtube.com/watch?v=gVFJVBcG_7Y