



STORIES: foSTering early childhOod media liteRacy competencIES
Erasmus+ KA2 - Cooperation for innovation and the exchange of good practices
Strategic Partnerships for school education
2015-1-IT02-KA201-015118

MANUAL BOOK OF BEST PRACTICE ABOUT DIGITAL STORYTELLING IN EARLY CHILDHOOD

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APPENDIX A. Description forms collected by the research group

(We are not succeeded in include the Appendix A because of technical problems. We will put it as soon as possible)

APPENDIX B. The STORIES Exploitation Plan

(We are not succeeded in include the Appendix B because of technical problems. We will put it as soon as possible)

Introduction

This Manual Book is part of the Erasmus+ STORIES project (forSTering early childhOod media liteRacy competencIES). It is the first product of the research project and also a tool that the research team and teachers will be able to use later in the project.

Children are now born into a media-dominated society. From very early infancy, they use and interact with technology so much that they are often referred to as "digital natives". Nevertheless, such early exposure to and familiarity with technology does not necessarily translate into digital competency. The STORIES project explores this context, aiming to provide an opportunity to promote media literacy in kindergartens. In particular, the objective is to contribute to the development of digital competency through digital storytelling which, as the name suggests, combines digital tools with narration. Man has been handing down knowledge since the beginning of time. Stories continue to be a way of teaching children. By telling children stories, adults create an experience and invite the child into an exchange.

And that's not all. According to Bruner (1990-1992), both adults and children are capable of narrative thinking. This means that we tend to organise and explain our experiences by narrating them.

Inviting children to make up stories (storytelling) means nurturing their narrative thinking as well as a variety of other skills, including linguistic and creative ones. Digital storytelling also stimulates digital competency.

The STORIES project aims to carry out an action-study involving a large number of infant school teachers and children. Drawing on the experience and guidance of the researchers, the teachers will plan and present digital storytelling projects to children. The aim of the projects is to encourage media literacy and narrative skills. Several partners are engaged in monitoring the effects of the experiences on language learning and creativity.

Four countries (IT, DE, TK, FI) and six partners are involved in the project.

- Coopselios (IT) is the project coordinator. It is a cooperative of services to the person and to infancy, leading body in pedagogical innovation, leveraging on and originally reinterpreting the well-known Reggio Emilia Approach. Coopselios ECEC services (infant-toddler centres and preschools) have many

teachers already trained on the storytelling paradigm/techniques, and participated in several projects introducing digital media at kindergartens.

- University of Modena and Reggio Emilia (IT). It has experience in national projects about text comprehension / storytelling with preschool children, using visual and audiovisual materials. Furthermore, it participated in the previous EU project CREANET for developing a creativity framework in ECEC, particularly valuable for the work with media.
- Computer Learning (IT). It is a Cooperative society expert in following any organisation (especially school institutions) in the process of acquiring and introducing new media technologies and devices according to their everyday life needs and practices.
- Jyvaskylan Yliopisto (FI). The research team, from Agora Centre, has both coordinated and participated in many national and international projects dealing with educational technologies. The team already worked in partnership with University of Modena and Reggio Emilia within the aforementioned EU project Creanet, investigating the relation creativity and technology
- Mimar Sinan Fine Arts University (TK). The research group has competence in EU projects; ranging from Educational Sciences (allowing cognitive science observations) and Graphic Design. It collaborates with University of Modena and Reggio Emilia in projects with local schools aimed at promoting and assessing children creativity at all levels.
- Pädagogische Hochschule Karlsruhe (DE). The research group is specialised in language learning in ECEC and has experience on the use of media in education (e.g., doctoral programme “Performing Media”). The university is currently involved in a project focusing on the use of DST for foreign language learning (English), in partnership with local schools, working in strong synergy with educators and external cooperation partners for the design of training practices.

This Manual Book is split into two parts.

The first part reconstructs the theoretical framework around the stories. In particular, it defines the pedagogical background to conventional and digital storytelling. A definition of digital storytelling is provided and the main teaching strategies

presented, namely those which would be useful in digital storytelling for pre-school children.

The second part examines 19 different digital storytelling practices for pre-school groups used in European and non-European contexts in order to outline the key factors.

The information sheets for the 19 digital storytelling practices and the stakeholders map are provided in the appendix.

PART 1.
STATE OF ART

CHAPTER 1. Pedagogical premises of DST or ST

1.1 Overview of Constructivism as Learning Theory

Constructivism as an approach to teaching and learning has evolved from psychology and information processing theories and in recent years has increasingly incorporated ideas from linguistics, anthropology, and sociology. In recent decades, it has emerged as a dominant paradigm in education: the emergence of this paradigm has coincided with a shift in pedagogy away from teacher-centred information transmission models toward knowledge-centred and learner-centred approaches that focus on cognitive and social processes in learning.

Constructivism in education is rooted in notions from cognitive and social constructivism: the former is grounded in the work of Jean Piaget and accentuates cognitive development and individual construction of knowledge; the latter emphasises social construction of knowledge and is generally attributed to the work of Lev Vygotsky.

Piaget's view about learning is based on his theory of intellectual development, for which the child is constantly creating and re-creating his own model of reality, achieving mental growth by integrating simpler concepts into higher-level concepts at each stage. Piaget argued for a "genetic epistemology," a timetable established by nature for the development of the child's ability to think, and he traced four stages in that development. He described the child during the first two years of life as being in a sensorimotor stage, chiefly concerned with mastering his own innate physical reflexes and extending them into pleasurable or interesting actions. During the same period, the child first becomes aware of himself as a separate physical entity and then realises that the objects around him also have a separate and permanent existence. In the second, or preoperational stage, roughly from age two to age six or seven, the child learns to manipulate his environment symbolically through inner representations, or thoughts, about the external world. During this stage he learns to represent objects by words and to manipulate the words mentally, just as he earlier manipulated the same physical objects. In the third, or concrete operational stage,

logic in the child's thought processes and the classification of objects by their similarities and differences occur. During this period the child also begins to grasp concepts of time and number. The fourth stage, the period of formal operations, is characterised by an orderliness of thinking and a mastery of logical thought, allowing a more flexible kind of mental experimentation. The child learns in this final stage to manipulate abstract ideas, make hypotheses, and see the implications of his own thinking and that of others.

Learning therefore becomes a dynamic process that involves change, self-generation, and construction, each of them building on prior learning experiences occurred through reading, listening, exploration and other experiences. Piaget used the concepts of *assimilation*, *accommodation*, and *equilibrium* in order to explain how new information is shaped to fit with the learner's existing knowledge, and the same existing knowledge is modified to accommodate the new information. New experiences are assimilated and integrated into existing schemas or into schemas under construction through the process of accommodation; the outcome of these processes is equilibrium – the achievement of new understandings, coherence, and cognitive stability.

The new conception of learning requires a new idea of teaching as well. If the development of certain processes of thought was on a genetically determined timetable, it follows that simple reinforcement is not sufficient to teach concepts; the child's mental development would have to be at the proper stage to assimilate those concepts. Thus, the teacher becomes not a transmitter of knowledge but a guide to the child's own discovery of the world.

On the other hand, Vygotsky insists on the aspect that children's thinking and meaning-making is socially constructed and emerges out of their social interactions with their environment: children's learning is thus facilitated by parents, peers, teachers, and others around them in the community. Vygotsky's "zone of proximal development" is the level at which learning takes place: it comprises cognitive structures that are still in the process of maturing, but which can mature only under the guidance of or in collaboration with others. Active engagement, pursuit of diverse paths to discovery, and external and internal scaffolding are central to the learning process: namely, external scaffolding supports learners' acquisition of knowledge by breaking down tasks into comprehensible components, modelling, coaching, providing feedback, and appropriating responsibility for learning to learners; internal

scaffolding engages the learner in reflection and self-monitoring to enhance acquisition of concepts. Teachers too are learners in this context: they observe and identify students' zone of proximal development (ZPD); design appropriate, authentic, and meaningful learning modules through problem solving tasks; and provide instructional support and scaffolding to propel students to construction of higher levels of understanding.

Another key contribution to constructivism in education is provided by Jerome Bruner. According to Bruner, important outcomes of learning include not just concepts, categories, and problem-solving procedures previously invented by culture, but also the ability to "invent" these things for oneself. Cognitive growth involves an interaction between basic human capabilities and "culturally invented technologies" that serve as amplifiers of these capabilities. These technologies include language itself: like Vygotsky, Bruner argues that language serves to mediate between environmental stimuli and the individual's response.

The mediation by language is one form of the third mode of representation. In his research on the cognitive development of children (1966), Bruner proposed three modes of representation: *enactive representation* (action-based information), *iconic representation* (image-based), *symbolic representation* (language-based). Modes of representation are the way in which information or knowledge are stored and encoded in memory. Symbolic mode is the most adaptable form of representation, for actions and images have a fixed relation to that which they represent, while symbols are flexible in that they can be manipulated, ordered, classified, etc. Among symbols, language is important for the increased ability to deal with abstract concepts: the use of words can aid the development of the concepts they represent and can remove the constraints of the "here and now" concept.

Rather than neat age related stages (like Piaget), according to Bruner the modes of representation are integrated and loosely sequential only as they "translate" into each other. Bruner's work suggests that a learner even of a very young age is capable of learning any material so long as the instruction is organised appropriately.

As a consequence of this view, according to Bruner the purpose of education is not to impart knowledge, but instead to help children constructing their own coding system for knowledge and becoming "autonomous learners". This is possible through the concept of the *spiral curriculum*: this holistic model involves information being structured so that complex ideas can be taught at a simplified level first, and then re-

visited at more complex levels later on. Therefore, subjects would be taught at levels of gradually increasing difficulty (hence the spiral analogy). “Spiral organisation” identifies one of the principles of constructivism provided by Bruner: instruction must be concerned with the experiences and contexts that make the student willing and able to learn, as well as instruction must be structured so that it can be easily grasped by the student. Moreover, it is to be considered that instruction should be also designed to facilitate extrapolation and or fill in the gaps, going beyond the information given as well: Bruner believed in fact that the most effective way to develop a coding system to build one’s own knowledge is to discover it by your own rather than being told it by the teacher. Therefore, the role of the teacher should be to facilitate students discovering the relationship between bits of information, without organising for them.

It can be noticed that Bruner, like Vygotsky, claims for a social nature of learning, citing that other people should help a child develop skills through the process of *scaffolding*, whose concept is very similar to Vygotsky's notion of the zone of proximal development: it involves helpful, structured interaction between an adult and a child with the aim of helping the child achieve a specific goal.

In brief, according to Bruner’s constructivism learning becomes a process of discovery where learners construct their own knowledge with the active dialogue of teachers, building on their existing knowledge and pursuing the aim of “learning to learn” and becoming “autonomous learners”.

Increased attention in recent years to the science of learning, knowing, and developing understandings has brought constructivism - with its emphasis on the combined cognitive and sociocultural impact on learning - to the forefront in education. Constructivism has placed the learner’s individual development at the focus of instruction and learning and has acknowledged the critical role in the learning process of endogenous factors and internal schema combined with exogenous social and cultural variables. When the combined role of endogenous and exogenous variables is taken into account, a common misconception that constructivist learning emerges from learners’ knowledge without direct instruction from teachers is refuted: learners benefit from multiplicity of approaches and learning experiences as they extract salient information in acquiring new knowledge; they also benefit from assistance by teachers who attend to their interpretations and provide relevant guidance and scaffolding to promote meaningful learning.

The constructivist experience creates opportunities for learners to engage in hands-on, minds-on manipulation of raw data in quest of identifying new and increasingly complex patterns, acquisition of novel concepts and construction of new understandings. The benefits of constructivist-based educational settings for learners' academic, social, and affective growth have been widely documented (see for example Brooks, 2002).

1.2 Multiliteracy and Media Literacy

1.2.1 New educational needs: Multiliteracy

The multiplicity of communications channels and increasing cultural and linguistic diversity in the world today call for a much broader view of literacy than portrayed by traditional language-based approaches. Multiliteracies overcomes the limitations of traditional approaches by emphasizing how negotiating the multiple linguistic and cultural differences in our society is central to create access to the evolving language of work, power, and community, and fostering critical engagement.

The term “multiliteracies” was coined by the New London Group, a group of ten academics from different countries (US, Australia, United Kingdom) who met at New London (New Hampshire) in the United States in September 1994. They intended to give a response to two significant changes in globalised environments:

- the proliferation of diverse modes of communication through new communications technologies, such as the Internet, multimedia, and digital media;
- the existence of growing linguistic and cultural diversity due to increased transnational migration.

Due to those changes in the world, a debate has arisen about the way students are instructed and learning in school. The New London Group (1996) proposes the formulation of “A Pedagogy of Multiliteracies” to replace the existing monolingual, monocultural, and standardised literacy pedagogy. The pedagogy of multiliteracies expands the focus of literacy from reading and writing to an understanding of multiple discourses and forms of representation, including visual, audio, spatial, and gestural,

subsumed under the category of *multimodal*. Its approach thus requires the involvement of Media Literacy, which provides a framework to access, analyse, evaluate, create and participate with multimodal messages. Moreover, Media Literacy builds an understanding of the role of media in society as well as essential skills of inquiry and self-expression necessary for citizens of a democracy.

1.2.2 The four keys of the multiliteracies pedagogical approach

The Multiliteracies pedagogical approach of the New London Group (1996) involved four key aspects: **Situated Practice**, **Critical Framing**, **Overt Instruction**, and **Transformed Practice**. *These four orientations were subsequently translated by the Australian “Learning by Design” project into the “Knowledge Processes” of “Experiencing”, “Conceptualizing”, “Analysing” and “Applying”.* Learning by Design can be considered as a reflexive approach: it is based on the synthetic combination of the diverse knowledge processes as well as of elements of didactic and authentic pedagogy¹.

Here it is a brief description of the original keys-schema:

- **Situated Practice** involves learning that is grounded in students’ own life experiences. It connects with the tradition called ‘authentic pedagogy’, first formulated as a direct counterpoint to didactic pedagogy in the twentieth century, initially through the work of John Dewey in the United States and Maria Montessori in Italy. Situated Practice involves situating meaning making in real-world and everyday lives contexts and takes account of the affective and sociocultural needs of learners who are culturally and linguistically diversified. This aspect of the curriculum needs to draw on the lifeworld experiences of students, as well as their out-of-school communities and discourses, as an integral part of the learning experience.

In order to apply Situated Practice to curriculum realities, Cope & Kalantzis (2009) reframed it as “experiencing” (p. 184). Experiencing takes two forms:

² McKeough (1997) splits the development of narrative skills in young children into the following age levels: sequences of events as a single event sequence (age two); sequences of events in which the physical world is related to the mental states of the individuals involved (age 3-4); sequences of events in which the mental states are linked to the psychological characteristics of the individuals (age 5-6).

- Experiencing the known: it involves showing or talking about something familiar-listen, view, watch and visit, reflecting on learners' own experiences, interests and perspectives (Cope & Kalantzis, 2015).
- Experiencing the new: learners are immersed in new situations or information, observing or taking part in something that is new or unfamiliar, but within the zone of intelligibility and close to their own life-worlds.

However, the New London Group (1996) points out limitations to Situated Practice. First, it does not necessarily lead to awareness of what one knows and does not even lead to critique reflection on historical, cultural, political, or value-centred relations about learning objects. Moreover, learners might be incapable of reflexively enacting their knowledge in practice. Therefore, they clarify that Situated Practice must be supplemented by other components.

- **Critical Framing** helps students to derive their own meanings from classroom activities, which encourage them to think, understand, and negotiate their ideas, realizing and respecting diverse knowledge perspectives.

Different prospects of critical framing are crucial to include students' pleasure and experience from family, friends, popular culture, social media, and language in the process of making text. Critical Framing in multiliteracies thus requires an investigation of the socio-cultural contexts and purposes of learning and designs of meaning, but it also helps to acknowledge increased socio-cultural contextualisation and diversification of text-types. The traditional curricula operate on various rules of inclusion and exclusion in the hierarchical ordering of textual practices, often dismissing text types such as picture books or popular fiction. Similarly, items like blogs, emails, websites, and oral discourses as well may often be overlooked as "inferior literacies". Multiliteracies pedagogies are instead aimed at critically framing and reconceptualising traditional notions of writing: it discusses the varying affordances of different modes and how writing become just one part of the multimodal ensemble.

- **Overt Instruction** is the direct teaching of "metalanguages" in order to help learners understand the components of expressive forms or grammars: for example, teachers can provide systematic instructions about classroom tasks towards the explicit explanation of different modes of meaning. However, Overt Instruction is not direct transmission, drills, and rote learning: it includes the kinds of collaborative

efforts between teacher and student in which the student can do a task that is much more complex than the task s/he can do it individually.

The original view of Overt Instruction includes the teachers and other experts supporting students through scaffolding and focusing on the important features of their experiences and activities within the community of learners. Teachers allow the learner to gain explicit information at times by building on and using what the learner already knows and has achieved.

This dimension of literacy pedagogy was reframed and translated in the Learning by Design project into the Knowledge Process of “Conceptualizing”. Conceptualizing involves “the development of abstract, generalizing concepts and theoretical synthesis of these concepts” (Cope & Kalantzis, 2015, p. 19). Using these knowledge processes, learners can categorise terms, and collect these into interpretative framework: they include, for example, drawing a diagram, making a concept map, or writing a summary, theory or formula which puts the concepts together.

Both teachers and students can explore possible pedagogies for classroom activities. For instance, teachers can suggest that students use ‘graphical concept map features’ for creating an interactive concept-map of their classroom learnings. Afterward, teachers can guide students to clarify what, why, and how these techniques improve their learning processes in technology-integrated environment.

- **Transformed Practice**, originally framed by the New London Group (1996)⁴, is embedded in *authentic learning*, where activities are re-created according to the lifeworld of learners. It involves applied learning, real-world meanings, communication in practice, and applying understanding gained from Situated Practice, Overt Instruction, and Critical Framing to a new context.

Transformed practice might encourage students to connect their learning experiences with their daily classroom tasks. Teachers can help students engage in reciprocal conversations that transfer ideas from one cultural situation to another. Learners can reflect on what they have learned while they engage in reflective practice based on their personal goals and values in new contexts.

Technology-aided educational tools can be used to transform information into knowledge and fulfil diverse language learners’ styles and needs (Egbert, 2004): for instance, combining text with graphics, arts, music, and other visual elements in classroom activities can encourage students to comprehend the learning process.

Transformed Practice subsequently underwent reformation and was renamed “Applying” as part of “Knowledge Processes”. Applying is considered as the typical focus of the tradition of applied or *competency-based learning* (Cope & Kalantzis, 2015). While learners actively learn by applying experiential, conceptual or critical knowledge in the real world, learners act on the basis of knowing something of the world, and learning something new from the experience of acting. That is, applying occurs more or less unconsciously or incidentally every day in the lifeworld, since learners are usually doing things and learning by doing them.

Applying can occur in two ways:

- *Applying appropriately* concerns how knowledge is perceived in a typical or predictable way in a particular situation. For instance, meanings are expressed in a way that corresponds to the conventions of a semiotic or meaning-making setting. Examples of activities include writing, drawing, solving a problem, or behaving in the usual and expected manner in a real-world situation/simulation (Cope & Kalantzis, 2015).
- *Applying creatively* involves the way learners transform knowledge they have learned from a familiar context and use it in a different context, unfamiliar to learners. As applying creatively is related to being active in the innovative and creative world, learners’ interests, experiences, and aspirations can be promoted. Examples of activities are: taking an intellectual risk, applying knowledge to a different setting, suggesting a new problem, and translating knowledge into a different mix of modes of meaning (Cope & Kalantzis, 2015).

To sum up, multiliteracies have a potential to adopt new ideas and overcome the limitations of traditional learning approaches in the 21st century. Teaching Multiliteracies opens new pedagogical practices that create opportunities for future literacy teaching and learning. Multiliteracies can also help teachers provide equal access to learning for all students. Moreover, through Media Literacy students learn to collaborate by sharing their thoughts with others in online spaces where they can engage in different form or modes (texts, video, image, rhymes, and poetry) of learning processes. Consequently, we can expect students to become more confident

and knowledgeable in their learning context through participatory and collaborative practices.

1.2.3 Early childhood and Media Literacy

In the last years, dealing with the role of new technologies in early-years settings, some have argued that new technologies are a distraction from more “natural”, “healthy” and “developmentally-appropriate” activities, or raised concerns that young children may access inappropriate content, risk personal safety through developing online relationships or engage uncritically with information (Miller, 2005). Other studies, for example Latour’s work (Latour, 2005), are instead used to prompt hypotheses about how children and technologies may be interacting: many young children engage in digital practices at home and such experience needs to be recognised as a resource for their current and future meaning-making.

Various initiatives over the last decade have begun to search for how best to facilitate use of ICT (Information and Communication Technologies) to support and enrich children’s learning. Moreover, it has been argued that educational contexts should provide children with opportunities to explore digital environments, and develop their critical evaluation of digital texts and critical participation in digital worlds.

In order to recognise the educational opportunities of ICT for early childhood, it is first required to de-stabilise existing assumptions relating to early-years literacy education.

Critics have long argued for the need to review schoolbased literacy practices, believing the definition of literacy should be broadened. The term “multiliteracies”, as just stated in our first paragraph, embraces the notion that there are multiple “modes of representation” which are much broader than language alone (Cope & Kalantzis, 2000, p. 5), and values diverse ways of knowing, thinking, doing and being.

It is underpinned by multimodal theory, that from birth a child actively seeks to make and understand messages and meanings in accordance with their interests and using available resources. Multiliteracies pedagogy can support children in communicate effectively using their preferred languages of communication. It also invites teachers to reflect critically on how their teaching approach enables different sorts of learning, and how they can support “new forms of communication which are

necessary to participate fully in our dynamic and culturally diverse society” (Mills, 2009, p. 10). Teachers must look beyond the dominant paradigms of literacy education and their teaching strategies that can marginalise students.

What about ICT and multiliteracies? Whilst some practices involving ICT replicate those associated with print texts and “old literacies”, others are associated with multiliteracies indeed, patterned by distributed relationships, multiple identities, multimodality and global participation (Lankshear and Knobel, 2006). ICT can support multiliteracies learning during short and long-term child-initiated, teacher facilitated, and open-ended project investigations.

There are multiple opportunities for children’s ‘hands-on’ experiences to design personal meaning and express cultural and linguistic diversity using a wide range of ICT resources. For the effective integration of ICT in educational programs that facilitated multiliteracies expression, the teacher is required to support child-initiated project work, where *constructional* aspects and new learning possibilities are explored.

ICT help children observe, fix, memorise, describe and share children impressions with other people, and to find answers to their questions. ICT shift and sometimes dissolve and eliminate borders between oral and written, between textual and pictorial, and even between internal and external. They use the possibility of a computer to exploit: a) the relations among objects (or actions, events, etc.), pictures (realistic fixation), icons (symbolic picture), oral names, and written names: b) the opportunity to use one of these entities instead of another and to interchange them when it is needed and possible as well as to connect them with internal speech.

This way, these instruments can support speech and literacy development of a child. For instance, an ‘active reading’ session of a short book could be based on playing with words in order to give a child a pattern of written speech and communication before s/he will really know how to read and write correctly. ICT can thus bridge the gap between oral and written enhancing children’s experience with linguistic objects (vocalised and written) and can increase motivation in writing. This approach is naturally supporting various types of ‘whole language learning’: it can be used also with children having learning difficulties and other types of special needs. In considering the significance of this approach for early years, it is also worth noting that studies of children’s interactions with digital texts in informal settings have

highlighted the playfulness, agency and creativity with which very young children may engage with digital texts.

ICT could be also oriented to help a child develop psychological instruments of literacy not for formal reading and writing only, but for creation, understanding, and thinking. These tools should give a child an opportunity, for example: to listen to any written word or story; to link a picture, a written word, and a recorded sound of the word; to create ('write') a sentence with words, attached to corresponding pictures, or mixing words and pictures; to listen to a sentence and then 'write' it – reconstruct it placing words in the proper order -; to input (draw, scan) new pictures, and type or assemble from letters on the screen new words, and so on.

The effective use of ICT to enable creativity is dependent upon careful consideration of the human–computer interface. As Cook and Woollard point out in (Hayes and Whitebread 2006, p. 107), less well-designed icons can impede ICT-based creativity and the development of ICT capability. It is also important that the ICT activities are embedded in physical experiences to ensure that the relationships between functions and 'real' activities are appreciated.

Moreover, it is observed frequently that children's creativity grows rapidly, if they are not isolated. Most children by their nature want to share, show and use technologies together with others. Digital technologies thus are a kind of strong icebreaker (Druin 1999) which helps bring children of different natures and interests closer or give them opportunity to get to know each other. Activities with ICT can significantly support communication and collaboration among children as well as their development in the social domain.

1.3 Using Stories for Instruction: Storytelling

1.3.1 Narrative thinking

"We live in a sea of stories, and like the fish who (according to the proverb) will be the last to discover water, we have our own difficulties grasping what it is like to swim in stories."

Jerome Bruner, *The culture of education*, p. 146.

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Narrative is conventionally defined as “the representation in art of an event or story; also: an example of such a representation” (Merriam-Webster, 2008). In philosophical terms, however, there is a great deal more to be said: narrative is a practice involving knowing, identity and rationality. In other words, narrative is one of the ways in which agents construct their knowledge of the world around them, their understanding of themselves, and their interlocution with other persons.

The educational psychologist Jerome Bruner was very influential in the narrative, specifically in relation to education and educational theory. Especially his theory of narrative as a specific ‘mode of knowing’ was very important for this ever-growing body of work.

In *Actual minds. Possible worlds*, published in 1986, Bruner started from a confrontation between two modes of knowing, two modes of cognitive functioning, each rendering different and distinctive ways of constructing reality and ordering experience: the logico-scientific mode and the narrative mode. For Bruner, the two modes are complementary though irreducible to one another and both have different operating principles, different criteria of wellformedness and different procedures for verification. The main difference is that logico-scientific arguments need to convince by applying procedures for establishing formal and empirical proof, and that narratives need to convince of their lifelikeness by verisimilitude. The logico-scientific mode of thinking looks for general and empirically tested truths, and the knowledge that it produces should not be contradictory. The narrative mode looks for the intentionality of human actions (what and why?) and the context in which these actions took place (where and when?). From the narrative perspective, truth is approached as situated or contextual.

1.3.2 Making sense of the world / making sense of ourselves

Bruner’s theory of narrative is an important part of his general theory of culture, mind and education (Bruner 1996, 2006). *The culture of education* (1996) especially concerns with the subject of cultural psychology and its implications for education. Cultural psychology deals with how individuals make sense of the world, how they engage with established systems of shared meaning, with the beliefs, values, and symbols of the culture at large. It concentrates on how individuals construct "realities"

based on common cultural narratives and symbols, and how reality is "intersubjective" — cultivated through social interaction — rather than "external" or "objective."

This idea differs sharply from the assumption that the mind is simply a mechanism for information processing. The nine central tenets or "motifs" underlying cultural psychology include the idea that the meaning of all facts, propositions, or encounters depend on the perspectives or frames of reference by which they are interpreted. Therefore, to understand what something "means" requires some awareness of the alternative meanings that can be attached to it; requires to belong and refer to a cultural frame.

To support this claim, Bruner (2006, p. 231–232) turns to the work of Claude Levi-Strauss (1962) who explored what is involved when we learn the standard practices of our culture. According to Levi-Strauss, a culture is foremost sustained by conventionalised exchange systems, such as systems for the exchanging of goods and services, forging marriage bonds, measuring esteem and information. However, because there are many different, complex and conflicting exchange systems within a culture, people are often confronted with changing expectations and uncertainties about the way to act in a given situation. This implies that “living in a culture requires not only knowing what’s conventionally expected, but having some sense of the unexpected troubles that the conventional can produce” (Bruner 2006, p. 232).

According to Bruner (2005, p. 56–58) (starting from one of many definitions of narrative), a story begins by presuming and creating the ordinary and conventional in some world, what is described as the initial canonical state, or a “stable ordinariness” (p. 56).

The next step, described as the engine of the narrative, is something questioning or violating this taken-for-granted state of things and undermining the “self-evident ordinariness” (p. 57). Bruner (2005) uses Aristotele’s term ‘peripeteia’ to refer to these “violations of the expected and the ordinary” (p. 57). The following part of this definition of a narrative is the action which can be described as “the efforts to undo the peripeteia, to restore the canonical state of things” (Bruner 2005, p. 57). When the initial canonical state is restored or when there is a new canonical state which resembles or replaces the one at the beginning of the narrative, we come to the resolution of the story, which “may take many shapes or, indeed, remain ambiguous”

(Bruner 2005, p. 57). Finally, a well-formed story also has a stated or implied coda, which refers to the normative stance, the moral of the story.

This definition of narrative forms the background to Bruner's theory of how we 'learn' to participate in a culture through narratives, because they help us to get acquainted with canonical states and with the possible trouble that can redefine or renew the initial canonical state. Furthermore, "narrative is also our simplest mode of imposing a moral structure on experience ... [because] the peripeteia is a disruption of the valued customary and a story's action is a stance with regard to such disruptions" (Bruner 2005, p. 58).

It follows that narrative is also something we need to make sense of ourselves. Every culture manages "to shape our minds in such a way that we become 'typical' Danes or Frenchmen, or for that matter, 'typical' professors or bank managers" (Bruner 2006, p. 230). Narrative helps to construct one's identity in the world by providing models of identity and agency through the stories of one's cultural context. To say that one is a teacher, for instance, is to invoke a particular sort of character that is defined at least partially by the cultural understanding of that character one's community shares. Teachers have certain characteristics, in the public imagination, and one's life as a teacher is importantly impacted by these expectations (some of which one might very well internalise). This conception posits narrative as a form of identity construction hence his use of the term *narrative identity*.

1.3.3 What consequences for education?

In *The culture of education* (1996) Bruner explores an "emerging thesis" in educational theory. This view holds that the way teachers instruct their students is determined to a great extent by the lay theories or implicit assumptions they have about how children learn. These intuitive theories are reflected in many of the common assumptions teachers have about children — that they are wilful and need correction, that they are innocent and must be protected from a dangerous or vulgar society, that they are empty vessels to be filled with knowledge that only adults can provide, that they are egocentric and in need of socialisation, etc. According to Bruner, once we realise that a teacher's conception of a learner shapes the instruction he or she provides, then equipping teachers with the best available theory of the child's mind becomes crucial.

He says that there are four dominant models of pedagogy today. The first views the student as an imitative learner and focuses on passing on skills and "know-how" through example and demonstrative action. This approach emphasises talent, skills, and expertise, rather than knowledge and action. The second views students as learning from didactic exposure: it is based on the idea that learners should be presented with facts, principles, and rules of action which are to be learned, remembered, and then applied. The third sees children as thinkers and focuses on the development of intersubjective interchange: this model revolves around how the child makes sense of his or her world. It stresses the value of discussion and collaboration. The fourth model views children as knowledgeable and stresses the management of "objective" knowledge. This perspective holds that teaching should help children grasp the distinction between personal knowledge, on the one hand, and "what is taken to be known" by the culture, on the other.

Modern pedagogy is moving increasingly to the view that the child should be aware of his or her own processes of thought (models three and four) and that achieving skills and accumulating knowledge (models one and two) are not enough. "What is needed," Bruner stresses, "is that the four perspectives be fused into some congruent unity, recognised as parts of a common continent" (1996, p. 65).

In order to achieve this aim, Bruner insists that the narrative mode of thinking and organizing knowledge must become a more integral part of public education. While the narrative approach has always played a key role in the teaching of literature, history, and other interpretive subjects, it can also be useful in science education, in order to emphasise the process-oriented nature of science: the goal would be to shift the focus from an exclusive concern with "nature-as-it-is" to a concern with the *search* for nature — how we construct our model of nature.

According to Bruner, narrative construals are not simply accounts fitted to specific occasions, but they indeed follow a number of universal principles. For example, they are structured around an unfolding series of events; the characters are motivated by real beliefs, desires, and values; their meanings are always open to interpretation; and they run counter to expectations or somehow deviate from what is considered legitimate.

Therefore, as the narrative construals work for participation in a culture and identity construction, in the same way they constitute models for the kind of awareness required by this educational view. "Surely," writes Bruner, "education could provide

richer opportunities than it does for creating the metacognitive sensitivity needed for coping with the world of narrative reality and its competing claims." (Bruner 1996, p. 149).

1.4 The Narrative Understanding

To determine whether children have acquired the appropriate comprehension skills, teachers and reading educators have used six basic tasks that are considered to be good indicators of narrative understanding.

These tasks include the following skills:

1. finding the main or the most important ideas in a narrative;
2. detecting or inferring cause and effect relationships among events;
3. ordering narrative events in the correct temporal sequence;
4. constructing coherence interpretations of the stories;
5. making inferences from the information given in a text and using this inferential information to make judgments about the text;
6. paraphrasing or summarizing the events depicted in a narrative.

An additional and less frequently used indicator of narrative comprehension is the child's ability to produce or write stories.

1.4.1 The Story Grammar

Narratology has put forward that a grammar of stories exists. According to this model (Stein and Glenn, 1979), even the most simple narrative involves two moments: the *Setting* (the physical, social, or temporal environment in which the remainder of the story occurs) and the *Episode*. The Episode can be divided up into five categories: the *Initiating Event*, the primary factors that induce a transformation in the protagonist's environment; the *Internal Response*, which in addition to the goal of the protagonist may also include an emotional reaction to the Initiating Event, and thoughts or plans about how to achieve the goal; the *Attempt*, the set of overt actions carried out by the protagonist; the *Consequence*, the positive or negative result of the Attempt; and finally the *Reaction* of the protagonist. More recently, Herman (2009, 2013) has defined the story as the prototypical member of the category of narrative, and has argued that stories are narratives that include all of the following elements: 1) *events*; 2) conscious

experiencing of events by agents; 3) tension to create events; 4) occasion for telling by a narrator. According to Herman, the analysis of making sense of stories should be coupled with the analysis of stories as sense-making. People use narrative as a problem-solving strategy in many contexts. Narrative functions are a powerful, basic tool for thinking and for reacting, a primary resource for building and updating models for understanding the world.

The story grammars (Johnson & Mandler, 1980; Mandler & Johnson, 1977; Stein & Glenn, 1979; Thorndyke, 1977) can also account for structural variation in multi-episode stories containing more than one protagonist. As illustrated previously, each episode in a story contains one goal plus an attempt and a resolution through goal attainment. The grammars specify the way in which multiple-goal-based stories are structured by describing the permissible ways in which an individual episode can be linked to another episode in a story. These rules are an attempt to illustrate how various goal structures of one or more characters can be logically related to one another. We illustrate these rules with the following descriptions. In the existing grammars, any two episodes in **a story structure can be connected by one of three relationships: And, Then, or Cause.**

The And relationship describes an episode structure where two episodes occur in a temporal sequence, according to narrative time, but where the episodes may have occurred in any order, or may have occurred simultaneously in real time. For example, many stories relate how two characters desire to pursue the same goal, e.g., a good, kind knight wants the hand of a beautiful princess, and an evil, villainous knight desires the same. In the beginning of the story, a description containing two episodes may be given, explaining why each knight desires the hand of the princess, showing the plan of each knight to attain his goal, and relating the initial attempt to each one to win the princess. These two episodes occur in a sequence in the story line, but there is no a priori reason to believe that one episode occurred before another. In fact, many of the rhetorical markers in the story (e.g., meanwhile, at the same time, etc.) allow the reader to infer that the two episodes were occurring simultaneously. After the two episodes occur, each of them is usually related to a third episode by a Then relationship.

The Then relationship is used when one episode follows another and is meant to convey two types of logical relationships. The first is where one episode sets up the necessary preconditions for a second episode to occur, but does not directly cause the second to occur. The second usage of the Then relation is where one episode occurs before another but has no causal relation to the second. An example of the properties of the Then relation is where the good knight goes on a quest to prove his valour and worth. After an episode in which he succeeds in his quest, he can now present himself to the king as a person worthy of the princess. The episode in which he seeks and obtains his quest does not directly cause him to present himself to the king, for he might have chosen an alternative course of action to prove his courage. However, the events in the first episode set up the necessary preconditions for the goal and attempt to be accomplished in the subsequent episode. As an example of the strictly temporal properties of the Then relation, consider the following sequence. Suppose the knight had to perform two unrelated quests, and that these could be done in any order. In the first episode, he obtains a golden fleece and in a second episode a golden egg. The success of the first episode neither causes nor enables the occurrence of the second episode. However, the two episodes do occur in a temporal succession.

The third type of connection, the Cause relationship, implies a direct connection between two episodes such that the first episode directly ensures the occurrence of the second episode. Certain problems arise in deciding whether episodes are connected by the Then or Cause relation, because the perception of a direct causal link depends upon the comprehender's knowledge about the events in the story. If more than one alternative episode can be generated after the occurrence of the first episode, the connection between the two episodes might be a Then relation. However, if the subject perceives that only one type of episode could result as a function of a previous episode, then the connection between the two episodes is likely to be a Cause relation. The types of relations connecting two episodes are strictly dependent upon the inferences made by a reader during the process of organizing the story information. The decision about the type of relationship connecting two episodes remains at an intuitive

level, taking into account our naive notions of physical and psychological causality including notions of multiple, sufficient, and necessary causes.

One question remains unresolved, a question that was addressed by narratology, but which has not yet received a response satisfying: Why can we attribute these powers above all to fictional stories? Shouldn't fiction distance us from the real world, from scientific knowledge and practical experience? In order to answer this we will synthesise some thoughts of the philosopher Paul Ricœur.

1) Ricœur starts out from the definition that Aristotele gives of *mythos* (translated as story) as *mimesis práxeos*, the representation of actions through the creation of a storyline. The understanding of the plot entails a preliminary familiarity with the conceptual mechanism of the action. Before beginning a story we are aware that actions have endings/results, motivation, and agents. We know that these agents react and experience and that they are responsible for consequences of their actions (Ricœur, 1983-1985, vol. 1). What does fictional narrative add to this basic narrative mechanism? It adds order and connection through the plot. Events causes and consequences are gathered together in the temporal unity of a total complete action (Gestalt).

We are no longer dealing with synchronic terms (agent, ends, means, etc) which only have a virtual meaning, or action sentences of the type X does A in this or that circumstance, rather with syntactic and diachronic relationships where individual terms receive a meaning through a sequential connection which the intrigue confers on the agents, their reactions and what they undergo. What's more the construction of the intrigue is a process where a simple sequence of events acquires a configuration, a synthesis of the miscellaneous: in fact we can always ask ourselves what is the "theme" of the story. All in all, since the causal link prevails on the succession of facts/actions, we are no longer dealing with simple contingencies but with universal types and processes (Ricœur, 1983-1985, vol. 1).

2) The act of reading is the vector of the ability of intrigue to model experience. This act expresses itself in the dynamism of the configurative act which it extends and brings to an end (Ricœur, 1983-1985, vol. 2). In the act of telling a story the imaginary world of the text comes face to face with the real world of the reader/listener. In consequence of this meeting, the narrative representation

produces a refiguration of reality both in the discovery of hidden dimensions of human experience and by transforming our vision of the world. (Here we can also refer to Morgan (2001) who demonstrates that using models and relating them to the world is a narrative activity). Narrative fiction has an heuristic value since it simulates an experience which is neither within nor outside a text but in between (its epistemological status is that of an intentional object).

3) The act of reading refigures in particular three spheres of human experience: a) the sphere of events and actions, b) the temporal sphere, c) the sphere of personal identity. According to Ricoeur, a narrative's characters only rise to the status of persons – fictional or real – who can initiate action when one evaluates their doings and sufferings and imputes them to the person as praiseworthy or otherwise. "The narrative constructs the identity of the character, what can be called his or her narrative identity, in constructing that of the story told. It is the identity of the story that makes the identity of the character (Ricoeur, 1990).

1.5 Play and Narration

1.5.1. From Exercise play to Symbolic play

According to Piaget (1945), the first two years of the child's life would be characterised by the practice play which manifests itself in making "empty" actions, in order to obtain pure functional pleasure, to use 'action plans' fully acquired. At about eighteen months, it would be the transition from practice play to symbolic play. In symbolic play, children pretend that something is something else, that is, they use an element to represent an element physically absent (for example, using a pencil as if it were a spoon to eat). In the sixth stage of sensorimotor stage (from eighteen to twenty-four months) the "symbolic scheme" appears. It means that the child wakes in the memory an "action scheme" in connection with an inappropriate subject for the sheer pleasure of it (for example, supports the head on a toy that reminds him of his pillow, closing his eyes as if asleep).

The symbolic schema then evolves into more complex behaviours, as can be seen by analysing the three stages elapsing from eighteen months to four years: 1) allocate their behaviour to others (for example, pretend to spoon-feed themselves and then a doll); 2) assimilation of an object to another (for example, use a pencil as if it were a spoon) or assimilation of themselves to someone else (for example, pretend to be a mother); 3) appearance of playful scenes in which the preceding stages behaviours are weaved together in wider narrative plots that compensate for, accept or anticipate reality.

1.5.2 Symbolic play and representational thinking

Piaget (1945) and Vygotsky (1966) both recognised that symbolic play signalled the beginning of representative thinking although they differed in the role they attributed to play in developing this ability.

Piaget saw symbolic play as a consequence of the transition from the sensorimotor stage to preoperational representative intelligence, based on a progressive assimilation of action schema; symbolic play does not contribute, therefore, to intellectual development, it is merely a symptom of it. Vygotsky, on the other hand, believed that play was the main driver of the development of representational thinking in pre-school children, allowing them to separate their behaviour from the perceived context and to act on the basis of a mentally-represented or imaginary situation. Children who use a stick during play to represent a horse are separating the meaning (horse) from the concrete reality around them. Through pretend play, children learn to take their first few steps in the world of meaning.

The relationship between symbolic play and representational thinking has been the object of attention in a recent group of studies entitled, "theory of the mind." According to Leslie (1987), symbolic play is the first sign that a child has developed such mental awareness, meaning that they are able to attribute mental states to themselves and others, and to predict behaviour on the basis of these states: the emergence of this ability, at around age two, also signals the emergence of meta-representational skills. Moreover, Leslie considered symbolic play, more or less in agreement with Piaget, the consequence or a symptom of cognitive maturity. Subsequent studies (such as Neilsen, Dissanayake, 2000)

suggested that symbolic play provides a developmental context for mental awareness.

1.5.3 Symbolic play and narrative thinking

Based on the distinction between logical-scientific thinking and narrative thinking, as described by Bruner, a series of studies carried out in the United States from the 1980s underlined the very close relationship between symbolic play and a child's ability to tell stories. Both pretend play and storytelling feature the activation of a narrative structure in which the imaginary world prevails over the perceived one; moreover, the narrative structure underlying symbolic play and storytelling by children is said to share the same evolutionary past: from the expression of individual actions to the combination of several actions to represent an event involving people, and an initially unproblematic event later developed around a dramatic nucleus. According to Bruner, the principles regulating the construction of a child's narrative interpretations of the world are established in the aforementioned cases; for example, the passing of time, marked by critical events which develop around actions caused by intentional mental states.²

According to Bondioli (2004), narrative thinking initially emerges through symbolic play, especially in the more advanced versions of the social form, namely where roles and themes develop around a problematic event.³ Subsequently, with the emergence of language and the ability to use it in a de-contextualised way to create narrative versions in an imaginary world, the stories children tell take on a life of their own, often distinct from their symbolic play. In other words, the child can use the albeit embryonic narrative thinking

² McKeough (1997) splits the development of narrative skills in young children into the following age levels: sequences of events as a single event sequence (age two); sequences of events in which the physical world is related to the mental states of the individuals involved (age 3-4); sequences of events in which the mental states are linked to the psychological characteristics of the individuals (age 5-6).

³ Piaget (1945) places collective symbolism (namely the social version of symbolic play) in the second developmental stage of symbolic play (age 4-7). The emergence of pretend play in a social context, with the progressive differentiation of and interaction of play roles would be the result of the revolution from egocentric to reversible and decentralised thinking.

Many of the subsequent studies have nevertheless shown a correlation between symbolic play, especially of a collective kind, and role-taking ability. Symbolic play between peers presents as a facilitating context for practising and consolidating decentralised thinking: playing with peers offers the opportunity to practice the abilities needed to adapt to a social world; in collective role-playing games, the first kind of collective intention begins to emerge, something which requires the sharing of rules and the ability to negotiate conflict situations.

that he already possesses by means of primarily non-verbal form of communication (such as acting out jumps with a stick between their legs) and with no need to use complex verbal expressions. After all, it is in social symbolic play that narrative thinking finds an important stimulus: interacting with peers to agree the type of game to play together requires the child to elaborate and specify his or her exact narrative contribution.

In summary, symbolic play is the first context in which the narrative thinking described by Bruner is fully exercised: to make sense of the world.

1.6 Narrative skills

When we ask children to make up a story we are also stimulating their narrative skills which comprise several different abilities.

Making up stories requires the ability to construct cohesive, coherent texts. Cohesiveness concerns the surface level of the text. A text is cohesive when there is agreement between the linguistic components, e.g. number, gender, verb tense, etc. It is also cohesive when the sentences are joined together by conjunctions, adverbs and connectors.

A narrative text, on the other hand, is coherent when it comprises a sequence of connected events. In other words, when there is a thread running through the contents, linking them together. This happens when the stories children tell, for example, have a beginning, a middle and an end. In the stories of older children, the grammar of the stories has a structure.

Furthermore, narrative competency allows children to build stories in which the events are well organised and spread across time. The links between events must also be causal.

Lastly, narrative competency requires the ability to weave together the concrete realm of fact and actions with the internal dimension, i.e. at the level of emotions and intention. To construct stories also requires children to have a theory of the mind which allows them to attribute internal mental states to different people.

1.7 Storytelling, creativity, metaphor

Contemporary studies into creativity insist that creativity does not come from or take place in a vacuum, but emerges from known facts and elements which are recomposed in a new and original way. In this regard, two expressions of the cultural life of man make emblematic examples: language and play.

Both language and play must obey given sets of rules, without which they would not exist as such; nevertheless, in both cases the rules can be applied in a variety of ways, either creating new messages or original, new play situations.

Poetic language, rich as it is with original and innovative metaphors, seems to be a significant example of artistic creativity. In effect, we can see this if we look at a verse by Mallarmé: "The sky is dead." The phrase breaks no grammatical or syntactical rules, nor does it use strange or unusual terms; nonetheless, it produces something innovative in semantic terms, giving *the sky* a predicate (*is dead*) that we would normally only use for humans.

By breaking semantic rules (whereby a given predicate is associated with the members of a particular category), the metaphor breaks predefined logical boundaries and links different domains in a creative way. It was no coincidence that Rodari, in his *Grammatica della fantasia* (1973), wanted to encourage creativity in children by asking them to make up stories starting from unusual combinations (i.e. the strange and unusual coupling of two words, such as "song" and "prison"). The concept of fantasy grammar implies that there is a degree of logic in creativity which, as it happens by example in the fantastic combination, frees words from the "verbal chains they are normally part of" (same, p. 21) and allows new semantic relations to be created.

Creativity then becomes a continuing dialectic between dissociation and recombination, the protagonists (words) of which become increasingly unstable because each can be replaced with another, in accordance with the general rules governing language.

We could also ask if activities like storytelling could also stimulate linguistic creativity in children, namely the creation of original metaphorical expressions. Over the past twenty years, developmental studies have started to describe children as "competent metaphor makers" (Gardner, Winner, 1982), bringing the

age the ability emerges much further forward. In pre-school years children already use language in unconventional ways, producing expressions which they can't possibly have heard from adults. American psychologist Ellen Winner (1988) analysed children's spontaneous utterances, advancing the theory that several early misuses of words may actually be metaphorical, thereby drawing the distinction between these uses and simple lexical mistakes. She reported four types of relationship between the early literal use of words in children and their corresponding use by adults:

- *overextensions*, i.e. generalisation, so using "ball" for everything round, including apples, knobs, etc.
- *underextensions*, when they are used in an overly specific way: saying "shoes" only for a specific kind of shoe, like trainers;
- words in which the meaning attributed by children overlaps partially with the meaning given by adults: "dog" may be used for large dogs or any large animal, but not for small dogs and puppies;
- words in which there is no relationship between the meaning attributed by children and the one used by adults: this is classed as an anomaly.

Of the aforementioned relations, one in particular -overextensions- is important because, being based on a similarity, it may be confused with metaphor. The problem, Ellen Winner pointed out, is to distinguish between and recognise misuses and unintentional uses which occur when children try to decipher the meanings of words from their metaphorical uses and end up misusing a word even when it is part of their lexicon. There is a discriminant however: overextensions are used to fill a lexical gap and will therefore gradually disappear once the right word has been found. Metaphorical uses, on the other hand, do not serve this purpose. In order to classify an expression as metaphorical, we need to be certain that children know the literal name of the respective object.

Winner describes two types of metaphor:

1) *Symbolic play metaphors*: used mainly around age two, emerge as a development of pretend play based on dynamic, functional grounds. Rather than perceiving a similarity, children rename objects on the basis of what they are in

the pretend play (for example, placing their feet in the waste-paper basket and saying, "boot");

2) *sensory metaphors*: emerge from the perception of a physical similarity and not from any pretend play. The perceived physical similarity very often concerns form (like when the letter "j" is called a walking stick). This type of metaphor occurs most frequently around age four.

It emerged from Winner's research that children's early use of metaphor derives either from pretence in symbolic play or from the perception of sensory similarities. Sensory properties are extremely important for small children who may not know much more about a particular object: for example, unlike children, adults know much more about the sun than just its shape and colour; they know why it exists, what it does, its position in the solar system as well as the many associations around it. For the same reason, it is much easier for children to understand sensory metaphors than those requiring knowledge about the structure of things.

CHAPTER 2. The DST paradigm

2.1 Why use technology at school?

In the first chapter of this Manual Book, we discussed the importance, the meaning and sense of narrative for humanity.

Always, in fact, the man told stories to pass on knowledge and culture. He is telling stories orally. This is the origin of the practice of storytelling. Then, it began to feel the need to support the oral narrative to the images. Much more recently, it was born on digital storytelling (Petrucco & De Rossi, 2009).

This chapter aims on the one hand explore what is meant by storytelling and digital storytelling and on the other provide teaching suggestions for activities of digital storytelling in school.

But first of all, we ask ourselves about the 'reasons'. Why do we propose teachers to use digital storytelling, rather than storytelling? This question implies a previous question: why are technologies used in school?

The answers are many and at different levels.

First, because the teaching that uses technology is able to promote the motivation and the significant learning. The motivation is also connected to the fact that students think that technologies are engaging and fun. Furthermore, the technologies put the student at the centre. The use of technology requires an active involvement of the child (Boase 2013). Even when asked to invent and tell stories that have as their theme an external object, call stories, we have the tendency to become personal, through the connected processes of reflection that require students constantly to put themselves (rather than the content) at the heart of their studies. Arguably, this means that learning through this method inevitably becomes "personal" and centred on the learner and their experience, rather than primarily content-driven (Boase 2013).

According to de Corte (2011), the technologies in schools promote learning:

- Constructive, because it allows children to build the knowledge, rather than to acquire them;
- Situated, because it creates a specific context of learning in which children produce an artefact that can be shared with others;

- Self-regulated, because children are invited to confront and resolve a problem by acting actively and using their prior knowledge;
- Collaborative, because children learn together, also thanks to many opportunities for discussion and debate.

The storytelling methodology as a resource for education and training takes on the various features of a method intended to promote a generative development of the experience, the observation of the same and the insights derived from it (Petrucco & De Rossi, 2009).

In the second instance, use of technologies in schools should not be accepted 'a priori', just because we think that the technology produces development. Conversely, it is not even to be demonised a priori because it is believed that technology can determine alienations and disorders in those who use them. The technologies are not in themselves neither good nor bad. In schools, the employment effects of technology depends on 'how' it is used (Galliani et al., 2000). Technologies become important tools for school when teachers use them with reflectiveness and intentionality. This happens when the use of technology is intentional and functional to the achievement of learning objectives, when technology is used within a design teaching. (Guerra, 2002).

Thirdly, because children are born in a technology-filled environment. From a very young age, they meet, they interact and use technology in everyday life. However, they are not born competent in the use of technology (Prensky, 2010). Forming digital competence in the young generation is a strategic goal/aim of the school, because this competence flows into the wider competence of active citizenship (European Union 2006). The school has therefore required to teach children to use technology in a critical and responsible way, to solve problematic situations, to carry out the tasks effectively (Prensky, 2010). Teachers should accompany children to an adequate and effective use of technology (Pacetti, 2013).

Finally, because the use of technology allows for effective classroom management. It is, also, in order to achieve the education innovation and improving the learning (OECD, 2001).

2.2 Definition of digital storytelling:

When we speak of storytelling, we must immediately distinguish two forms: the experience of **listening** to stories and that of **invention and storytelling**.

In general, in this Manual Book we deal with this second form.

According to the Digital Storytelling Association (2002),

“Digital Storytelling is the modern expression of the ancient art of storytelling by using digital media to create media- rich stories to tell, to share, and to preserve.”

In a similar way, Garrett (2008) states that the Digital storytelling is born of the combination of the art of storytelling and digital tools.

“Digital storytelling combines the art of telling stories with digital tools such as graphics, audio and video” (Garrety, 2006, p. 6).

There are many definitions of digital storytelling, but in general terms, digital storytelling is defined as **telling stories and sharing information with multimedia tools and resources** (Yuksel, 2011).

A digital story is a media artefact. It is a story told using - in an integrated and combined way - the sound channel (verbal language, sounds ...) and visual channel (images, videos, graphics ...). Moreover, it is a story that is recorded and shared to digital media (Boase, 2013; Garret, 2008). According to Robin (2008 Yuksel 2001), it is the practice of using digital tools to tell a story.

According to Boase (2013) and Yuksel (2011), the power of digital storytelling derives precisely from the combined use of different forms and channels of communication. Moreover, the final product that is obtained has the advantage of being more durable in time, more accessible and more easily transferable. Digital storytelling is a very powerful communication tool, as new digital technologies have become less expensive and more widely available to larger numbers of people (McLellan, 2006 in Yuksel 2011).

Garrety (2008) distinguishes five kinds of Digital storytelling employed and employable in school, from primary to higher education:

1. *Traditional digital storytelling*: in which the students tell a story about personal events and experiences of their lives. In this sense, Meadows (2003) describes the digital stories like: “Short, personal multimedia tales told from the heart”.
2. *Digital stories of learning*: in which the student describes a content-knowledge. Digital storytelling becomes a tool that supports learning, because it forces students to deal in non-superficial content: to synthesise it, to turn it into a story, to tell not only with words but also with pictures and sounds. The product of this process can be understood as the *story of an individual's learning* (Garrety, 2008). In this 'kind of DST' the content that is told is not so much important, rather the process necessary for the construction of a story about the content is more interesting.
3. *Digital stories of project-based learning*: the digital storytelling can be thought and intense as a project-based learning. Both project-based learning and digital storytelling adventures call for complex learning environments that focus on meaningful engagement with real-life problems (Season 2005, in Garrety 2008 p. 19)
4. *Digital stories of social justice and culture*: where the student builds and tells stories on issues concerning justice, community development and culture.
5. *Digital stories of personal reflection*: in this case, the digital storytelling is to be intended as a tool to support reflective practice.

In our opinion, more effectively, Robin (in Yuksel 2011) categorises digital stories in three types, including

- (1) personal stories telling about one's own experiences, memories, or events,
- (2) informative or instructive stories, that teach specific subjects to an audience,
- (3) stories which examine historical events.

In light of this, digital storytelling can be considered as a **method**, a strategy that can be used in a variety of ways and with many different possible outcomes. According to Boase (2013), it's one method for using these digital devices **to support the educational process**.

2.3 Main contexts where DST can be used

Yuksel, Robin and McNeil (2011) have made an exploration of the aims with which the practice of digital storytelling is used in 26 different countries.

In 14 of these countries⁴, survey respondents stated that they are actively engaged in digital storytelling for educational purposes. The survey results demonstrate that those using digital storytelling in different countries have many different occupations. Most of the participants identified themselves as working in some type of educational endeavour, including college instructors, college students, school teachers, researchers, and instructional technologists, while a few respondents state that they were involved in the area of health, community development, media arts or video.

The findings also suggested that digital storytelling can be used in multiple subject areas including language arts, social studies, the arts, and science. In addition, some respondents use digital storytelling in teaching for technology literacy (Austria), healthcare education (the United Kingdom), and communication (Norway) (Yuksel, 2011)

This Manual Book aims at exploring the practice of digital storytelling in an educational perspective, with particular interest in the pre-school.

2.4 Why use digital storytelling in educative context? What potentiality?

The intent of this paragraph is to explore, through a review, what might be the reasons and aims to employ digital storytelling, in particular in educational context.

In general, Moon (1999) suggests that digital storytelling can offer a *“vehicle to facilitate learning”* (in Boase 2013, p. 10). Also Barret (2006) in his meta-analysis emphasised the DST capacities to support learning. He underlined also its ability to promote the learning of all students, taking the path of inclusion.

Certainly, the DST is one additional opportunity, not the only opportunity, for people to tell a story.

-their own history or the history of other people - through technological and digital media. Telling a human story allows you to contribute to the understanding of human actions (Petrucco & De Rossi, 2009; Boase 2013).

Digital storytelling is also a tool to **support learning reflection and self-discovery**. In the past, the digital storytelling has been used as a method for therapy, in which autobiography was used as a tool for self-discovery, now in an educational perspective it is used as a tool for use in self-reflection, **to make sense of their identity and experience** (Boase 2013).

The study conducted by Myers (1990, in Yuksel 2011), for example, shows that children enjoyed and **interacted in a storytelling activity more than** in a story reading activity. Moreover, during the reading, the students show a lower level of attention to what is detected during storytelling activities (Yuksel, 2011).

2.5 Learning impacts

What are the main learnings supported by the practice of digital storytelling?

It must be assumed that the skills-competencies requested and promoted by the practice of digital storytelling are at least partly those involved in the invention and storytelling. Indeed, according to Daniels (2010) and Sessoms (2008) the process of composing a story in a digital format is like a traditional story where the process of learning is interweaving meaning-making opportunities (Yuksel, 2011).

Therefore, to identify areas that are promoted by this 'method' (DST), it is useful to ask what skills are fielded both by the task of invention of stories (storytelling) and the task of invention of digital stories (digital storytelling).

Before exploring the skills involved and promoted by DST, we analyse those implied by the storytelling.

The process of constructing a story requires numerous cognitive strategies to come into play, such as **comparing, selecting, inferring, arranging, and revising information**. The process leads to the construction of a new story based on **existing information (prior knowledge stored in long-term memory) reflection, supposition and evaluation** (Boase 2013).

Inventing stories requires the ability to use their knowledge, and combine them in a new way (for Vygotskij it is creative act and thinking) establishing temporal and causal links between the parties (Boase 2013).

We can say, moreover, that inventing stories asks students to use the causal thinking in which the narrator seeks to fit their experience into some form of **narrative schema** (to be intended as the knowledge we have of the story grammar) (Robinson & Hawpe 1986, in Boase 2013).

In the task of inventing stories, also **critical thinking skills** are involved (Boase 2013). Critical thinking is the mental process of discernment, analysis and evaluation, which should reconcile scientific evidence with common sense (Boase 2013). Inventing and telling a story is, in fact, a task that requires to monitor the process of invention and the "quality" of story: whether the story is understandable, it is interesting/fun, deciding what to leave and what to omit, in what order to place and combine information... The quality of the resulting story, is linked by the subject's ability to reviewing, to reflect and meta-reflect (metacognition) on the story and its construction process. According to Garrety (2008), storytelling is in fact primarily a tool to reflect.

Therefore, the digital storytelling skills and competences which promotes that uses it?

Certainly, it increases **students' media and technology literacy** (Boase 2013), that is the ability to use adequately the technologies to communicate, solve problems and access information.

In general, Moon (1999) suggests that stories can offer a "**vehicle to facilitate learning**" (Boase 2013, p. 10). In his meta-analysis, Barrett (2006) emphasises the potential of digital storytelling to support and facilitate learning of ALL students, in the direction of inclusion. Boase (2013, p.10) says that "digital storytelling has the potential to empower students" .

Firstly, this process increases **students' media and technology literacy**: know how to choose the most appropriate technology, to use it appropriately, combining different types of messages (visual, verbal, sound, ..) to build a new

message. Intellectually and emotionally, creating a story involves cognitive processes of reflection evaluation and creation, while technically the production of a digital story can require some degrees of new media literacy (Boase 2013).

Digitally storytelling, like storytelling, is recognised as a useful tool in the promotion of **a deep learning too**, that Ausubel (2000) called “meaningful learning” in contrast with “mechanical learning”. “Mechanical learning” takes place when the subject acquires and stores information by juxtaposition, adding new knowledge next to those already in memory. The subject collects and accumulates gradually knowledge, risking to forget the more recently acquired. “Meaningful learning”, instead, takes place when the subject acquires new information, links and makes interacting with the knowledge you already have in memory until the construction of new knowledge structures. As a result of connecting the consolidated elements of knowledge with new knowledge, the new knowledge will be held in memory permanently (Ausubel, 2000)

Findings from other studies (Yuksel, Robin, and McNeil, 2011) suggest that digital storytelling supports student **understanding of subject area knowledge**, overall academic performance, as well as writing, technical, presentation, and research skills. In addition to these skills, the results confirm that students’ thinking, social, language, reflection and artistic skills are positively affected when their teachers use digital storytelling in their classroom.

As stated by storytelling, digital storytelling also promotes the **creativity** of individuals, perhaps even more so supported (Boase 2013, Garrety, 2008).

Digital storytelling can also be an educational opportunity to promote relations among students. In particular, this occurs when the invention of the stories takes place in a cooperative way, when the children invent stories together.

In summary, generally the method of storytelling associated with digital tools offers the potential to:

- **make sense of experience**

- value emotional/personal input
- promote **deep reflection**, review, analysis and ordering of information
- encourage the building of good relations (through, for example, cooperative activity)

Specifically, within education, digital storytelling has the potential to:

- Build and use **technology/media skills**
- Develop **literacy skills**
- Provide an alternative to written-based project work
- Stimulate **critical-thinking** faculty
- Promote **Meaningful learning**
- Enhance student **engagement and motivation**
- Enhance the **learning experience**

(Alterio, 2002, in Boase 2013; Barret, 2006)

Summarising the digital storytelling promotes, firstly, **the capacity for reflection** on a topic or about oneself, and skills associated with personal development and interpersonal skills.

Secondly, it promotes the **literacy and media literacy skills** and technical skills. Finally, it promotes the **meaningful learning** which can also derive from experience with digital storytelling.

There is some research about how digital storytelling is used as a learning and teaching tool in the classroom. These studies are especially focused on K-12, higher education and adult learning (Banaszewski 2005, Butler, 2007, Dogan, 2007, Brzoska, 2009 in Yuksel 2011). However, there are **very few studies about using digital storytelling in early childhood educational settings**. The Yuksel study (2011) provides basic ideas for future studies to investigate the incorporation of digital storytelling in kindergarten classrooms by attempting to present new teaching and learning strategies using digital devices. The strategies and methods that Yuksel used in her study will be resumed in the section of this Manual Book, analysing digital storytelling practices.

As part of these few studies that have addressed the use of digital storytelling in kindergarten, the researchers say that the practice of the invention of stories allows preschoolers to consolidate their knowledge about the world and to foster the acquisition of vocabulary, fluency of language and the symbolic and metaphorical thinking (Farrell & Nessel, 1982; Collins, 1999 and 1985 Yuksel Maguire 2011).

According to Petrucco and De Rossi (2009) and Garrety (2008), the practice of storytelling in preschool also supports emergent literacy, namely it enhances the first learning in preparation to the ability to read and write.

2.6 Main characteristics and work phases

To build/make a digital storytelling, there are certain "rules" that characterise the textual genre of "digital story" (for example, a length of about two and a half minutes, an average number of words, the use of only one, author's voice), but these elements are not constrictions. They represent a series of characteristics of the text that has proven **to work** (Boase 2013).

It's clear that digital storytelling combines a number of aspects, and depending on how it is used, it requires different didactic tasks and supports different learning.

The effectiveness of a digital story depends primarily on the story it tells, enhanced by the images. Most effective digital stories are short: up to two and half minutes long only (Boase, 2013).

It's important that the practice of digital storytelling be built on and from a story: *"The Importance of having a story at heart of a digital story - with a beginning, an end and some development and interest between this points"* (Boase, 2013, p. 2).

At the heart of digital storytelling in practice there is a story, that is a text, and not a description, ruled by temporal and causal links. We can think of a story as to a chain of events (Mishler 1995 in Boase, 2013). This implies that in a story there are causal links and thematic coherence, as well as a temporal order.

The story, moreover, is characterised by having a **plot**. The plot combines the events on the whole of story (Boase, 2013).

In addition, the story must have a **general meaning**. Often, it is also the bearer of a **moral**. For this reason, when we build a story, you have **to select the information you want to tell**: you have to choose what to show. Indeed, the story does not replicate reality, depending on what you choose to tell and from what 'angle' you show different aspects, give rise also to "teachings" /different meanings (Boase, 2013).

According to Petrucco and De Rossi (2009) storytelling provides these four steps:

1. **Making sense**: identifying a problematic aspect (situation) around which to build the story
2. **Making meaning**: reflection on the meaning you want to give to the story and the elements (images, sounds, words, ...) to choose and combine the construction of the story
3. **Working with meaning**: to work on the meanings and elements (images, sounds, words, ..) to generate new ideas
4. **Transformation learning**: peer comparison on the meanings and elements to give rise to learning

These steps correspond to the more specific phases of construction of the story (Petrucco & De Rossi, 2009):

1. **Story finding**: story told for a specific purpose and using multiple languages
2. **Story expanding**: expansion of story adding data and related conceptual connections
3. **Story processing**: processing of story through collaborative thinking, (formulation of problem and problem solving)
4. **Story reconstructing**: metacognitive reconstruction of story through the debriefing method (metacognitive reflection) which enables subject to grasp and to reflect about:
 - a. the logical tools used in the experience
 - b. the reports and the assumptions that led to the modification of their behaviour in the face of a problem

c. the communication processes, emotional-relational who have influenced and pervaded the action

The Centre for Digital Storytelling (2010) has been very influential in identifying the **major components of a digital story** by breaking the creative process into **seven steps** (which are aspects that characterise the digital storytelling).

This process, known as “The Seven Elements of Digital Storytelling” includes the following components:

- (1) Point of View shows the purpose and author’s perspective of the story,
- (2) A Dramatic Question arouses the audience’s curiosity and will be given an explanation by the end of the story,
- 3) Emotional Content involves the audience in terms of the emotions,
- (4) The Gift of Voice is a voice (tool) that helps the audience understand the story
- (5) The Power of Soundtrack is the music which supports the story,
- (6) Economy avoids overloading the viewer with excessive use of visuals and/or audio
- (7) Pacing provides a rhythm to the story and deals with how slowly or quickly the story is told (Centre for Digital Storytelling, 2010 in Yuksel 2011, Barret, 2006).

According to De Rossi and Petrucco (2009), the construction of a digital story requires the following steps:

1. Choice of **purpose/aim** and **audience** of the story
2. Choice of the availability of human and technological **resources**
3. Implementation:
 - a. Choose the **theme** and the type of story (choice of topic on which making up a story.) Compared with the schema of the stories;
 - b. **Storyboard**: design/invention of the story;
 - c. Production video, digital photos (drawings and / or photos)
 - d. **Assembly** and processing images and audio music

- e. Spread the video and evaluation on the audience feedback to improve the product (with the class group/For other sections?/For Parents)

2.7 Main strategies in the use of digital storytelling at school

The elements that distinguish the digital storytelling practice from the 'normal' use of multimedia materials to create a video is that the technology is used to tell a story which is then shared with others. The digital storytelling, therefore, results in a **product** that is multimedia and digital. The digital storytelling, however, is also a **process**: the process necessary to build the story (Petrucco & De Rossi, 2009). The intent of this paragraph is to describe the main strategies useful for making the digital storytelling projects in the educational context, with particular attention to the preschool children.

Many authors (Boase 2013; Barret 2006) claim that the practice of digital storytelling requires the use of strategies focused on children: where children are active protagonists and the adult is the facilitator and “director”.

Barrett suggests the use of **student-centred learning strategies** facilitated by these elements (which are also macro-teaching strategies) :

- Student engagement
- Reflection for deep learning
- The effective integration of technology into instruction
- Project based learning (Barret 2006)

Ohler (in Boase, 2013) argues that in the practice of digital storytelling is important as a first step it is important to ask the children **to invent** a story, an oral one in preschool.

It should be recalled that according to Boase (2013) stories that are invented orally tend to be more personal than those that are invented in writing. The oral invented stories are more fluid, less static and have more chances to revision. On the contrary, the stories invented in written form that are more "fixed" and refer more often to a particular time or event.

Hall (in Yuksel 2011) considered three ways young children experience telling their own stories in preschool settings.

- The first way is **self-recorded stories**. In this type, children have self-recorded what they want to say in a story. The teacher **can tape record** the children telling their stories. Although young children have difficulties creating precise tales, they have the advantage of hearing their own voices when creating stories. In this technique, Hall suggests some rules for teachers. “The major rule is that children **must not listen to their story immediately**, after they have recorded it” (Yuksle 2011, p. 87). According to Boase (2013) claims that at the first time children invent the story and then teachers audio-record or write the story. Later, children hear the invented story. This listening is the basis for the next elaboration, revision and realisation of the story in digital form.
- The second way to tell the story is through **adult recorded stories**. In this type of storytelling, the adults type young children’s words and **frequently repeat the words to them** (such as reflective listening, 1951) . Hall (2001) stated: “The process of typing the stories was itself revealing about children’s ability to control their language” (in Yuksle 2011, p. 90). In this case, the adult recorded story is a procedure teachers may follow for creating their digital stories.
- The third way is **symbolic play as storytelling**. In this type, children create their stories during their sociodramatic/pretend play. This is a collaborative storytelling experience. Hall (2001) described this way of telling story as “..a complex phenomenon, and the fact that it often happens relatively spontaneously and seamlessly is a compliment to children’s intellectual and narrative abilities” (in Yuksel 2011, p. 96).

Usually, the invention of the stories is supported and facilitated by the use of **open questions**. The teacher with a few well-designed open questions can support the construction/invention of the stories (Boase 2013).

Garrety (2008), De Rossi and Petrucco (2009), Yuksel (2011) and Boase (2013) indicate that in the practice of digital storytelling it is useful to invite the children

to work in **small groups**. For example, it is effective to ask the children to invent a story together collaboratively. It is also useful to listen to the story of other children who can comment on it. This discussion may be useful to review the story. This continuous and cyclical process of "invention-discussion-revision" allows the large group of children to discuss the meanings building together. For these aspects, the practice of digital storytelling is also useful to support the quality of relations and social cohesion of the children group.

To invent stories requires children to **think and act creatively**. How can the teacher support the creativity of children? We think that the teaching suggestions that come from Creanet Research (Gariboldi & Catellani, 2013) are useful suggestions even when the teacher's aim is to support children during the educational projects of digital storytelling.

Vygotsky (1932) has already spoken a lot about creativity in the *combined sense* when **he defined it as the activity that produces something new, either material or immaterial, combining elements to achieve a goal**.

Subsequently Craft (2001) distinguishes Creativity (with a capital "C") from creativity (with a lowercase "c"). Creativity (with capital "C") refers to the great artists or genres that combining elements (materials or knowledge) that possess and then they produce something NEW ABSOLUTELY for the community. Instead, the creativity (with lowercase "c") refers to all people. Even Petter (2010) speaks about creativity with a lowercase "c." In this sense, a person is creative when it produces something NEW FOR HIM, combining elements (materials or knowledge) which already owns. It is a creativity that could be called democratic.

When we speak of children's creativity that makes digital storytelling we refer to creativity with a lowercase "c".

From Creanet research, (VVAA 2013) educational suggestions to foster creative thinking of children concern five aspects:

Educational aspects to support creativity in preschool (VVAA, 2013):

1) Organisation of time:

- a) *continuity of the proposed experiences*: the educational project must take place in a non-occasional moment. The project activities should take place on a continuous basis. The activities carried out by the children should be linked to each other not only by their common guiding aim, that is to invent a “good” digital story, but also by that *‘fil rouge’ or common thread* made of the intentionally gradual and logical order of the activities.
- b) *time for reflection*: it is important to have time for reflection. Children must have time to reflect on what we have built / invented, to discuss, to review, to redesign. According to Runco and Cayirdag (2009), this ‘relaxation’ of time that foresees even long extended moments of sedimentation and articulation of thoughts is an essential condition for the emergence of processes of recombination and creative association.
- c) *distension /extension of time*: the project must not be conducted in a short time, but rather in an extensive period of time, in which children can act and think with the times they need. The possibility of having at disposal a great length of time, that is not limited or finite in a brief amount of time, certainly encourages the emergence of creative processes which mature when the experience taking place has the time to mature due to children’s reflections and revisions.

2) The possibility of exploring and experimenting with different spaces and materials.

- a) *making adequate environments available*: i.e. environments that guarantee once again the possibility of a plurality of experiences of exploration and discovery. Teachers have to organise the space and the materials in an adequate manner. They must put in the space a variety of different materials (as for shape, colour, size, physical characteristics, ...) that can be used by children. These materials must be placed within the reach of children and well organised in space. The organisation of space, on the one hand, must allow children to act and move in autonomy and freedom. On the other side, the organisation of space and materials must support creative thinking of children.
- b) *transformability of spaces*: teachers should be aware that space is not something fixed. Teachers need to redesign and change the space during

the educational project on the basis of children's behaviour, to make the space more able to support their development and their cognitive processes.

c) *promotion of exploration/experimentation with different spaces and materials*: teachers should encourage children to explore and experiment with the different spaces and available materials. As we will see at the end of this section, according to Adams and Chen (2012), subjects act creatively when they first know very well what they will use to produce something new for them (in this sense, something creative).

3) **Interaction and Collaboration between children in open-ended problem-solving situations.** In order to encourage the creativity of children, it is useful to put children in *problem situations defined malformed*, as mentioned by Ward (2009). These problems can be addressed by following different paths of reasoning and can also give different results. Problematic situations foster creativity because children require an analysis of the initial situation, planning and verification of a solution capable of transforming a certain element from an initial state to a final (Castoldi, 2010). Moreover, creative thinking is fostered when the problematic situation is approached by a *small group* of children. The group works as a sounding board for the re-laborative and creative thinking. When the problem is dealt with collectively by the group, children compare and negotiate the different views and assumptions to build together a single solution to the problem (Arieti, 1979). Each student expresses their thoughts, suggesting ideas and suggestions to their peers; so that gradually a single type of creative resolution process takes shape (Gariboldi, 2012). In summary, the comparison and interaction within a small group seems to encourage the emergence of more complex creative processes than those of the individual, thanks to the construction of a common thought that is the result of the combination and reciprocal influence of the contribution of each individual child.

4) **Promotion of the association and combination of different symbolic languages and systems.** Vygotsky (1932) has already spoken on creativity in the combined sense, when he defined it as the activity that produces

something new, either material or immaterial, combining elements with additive ends. In this sense creativity is seen to be a thought which connects as the ability to bring out associative links connections and gather together unusual associations between ideas and objects, referring also to the different domains of consciousness (Gariboldi; 2012; Pinto, Minerva, Vinella; 2012). Perhaps, in the light of considerations made in the previous point (no. 3) it is possible to think of the combinatory character of creativity even in social terms, or rather, when it implies the connection between the thoughts of different children. By continuing to reason about this connection, it seems reasonable that creative education should include , among its various ingredients that accompany it, even intentionality to develop different symbolic systems so as to make them communicate and integrate (Pinto Minerva, Vinella, 2012).

5) Attitude of the Educator in Fostering Creativity.

- a) *habit of the teacher to propose tasks which expect open results* or rather, tasks which can be faced in different ways with a number of possible solutions. It is therefore the contexts themselves that solicit in children project-led thinking which starts from the analysis of the initial situation so as to arrive at its transformation (Castoldi, 2010). This type of task is potentially able to promote creativity, because in carrying it out it is very probable that the children run up against problem solving situations which foresee multiple solutions
- b) *accompanying children* during the experience, providing them *an emotional support* (supportive behaviour). Many authors in the theoretical debate on educating for creativity indicate the need for providing a psychologically reassuring environment in which it is possible to fail and make errors (de Sousa, Fleith, 2000; Harrington, 1999). If creativity is solicited, in fact, through open-ended problem-solving situations, then, precisely due to the absence of one single and conventional answer, children can stumble over obstacles and can even take inadvisable roads. An error, however, should not inhibit thinking, rather, should become an educational opportunity, or rather, a stimulus for continuing to find alternative and perhaps even divergent paths. By searching for such solutions it is important to

promote and maintain the willingness of the children to participate cognitively in the task, to become involved and to express their own thoughts without fear of making mistakes. It becomes necessary therefore to provide an accepting and non judgmental atmosphere, in which relationships with peers and with educators are supportive and empathic, rather than based on competition and performance (Travaglini, 2000; Griéger, 2003; Laslock, Winefiled, 2011). A useful tool for creating a welcoming and non judgmental environment could be ‘verbal mirroring’ (reflective listening) (Rogers, 1951, 1982). This is a communicative strategy which allows the adult to centre the conversation on the children’s thoughts and tune into their reasoning. When the adult mirrors, they express and show to the speaker active listening, genuine interest, intention and desire to know the others thoughts without being judgmental. These are the reasons why mirroring can create an environment in which children are more willing to participate cognitively in the activity, express themselves and become involved without hesitation. (Bertolini, Cardarello, 2012).

- c) *recognizing the importance of children’s ideas*. It concerns a particular adult behaviour which contributes in turn in communicating to the children trust and interest on their behalf, creating a welcoming climate and non judgmental climate which promotes their willingness to participate in the task.
- d) *recognizing creativity within the daily routine*. It is concerned once again with listening to the children with the aim of highlighting interests, and thinking in their spontaneous behaviour and in routine moments, that could become useful occasions for encouraging potential creative thought.
- e) *knowing and understanding children’s development and the development of learning and teaching processes*. This is about an indication of general value. Undoubtedly each time a project is planned with the aim of soliciting certain competencies, certain strategies must be chosen and activities developed that take into consideration both the level of development of the child and the theories of learning and teaching being referred to.

In the design of activities about creativity in preschool, we believe it is useful to recall the Phases proposed by Adams and Chen (2012) about developing/fostering children creativity.

1. **Exploration and experimentation of materials** with the aim to understanding the physical properties. This represents a preliminary and necessary condition to the following steps.
2. **Making and Constructing**, which consists in combining/assembling explored materials without the child necessarily intending to build or make anything definable.
3. **Inventing** something with a function or an aim that is previously planned by the child.
4. **Creating together** which entails peer involvement and dialogue aimed at the construction of something in common and on a large scale.

According to Petrucco and De Rossi (2009, p. 52), digital storytelling require training, even for adults. For example, the Centre of Digital Storytelling organised training for 8-15 people in three days, consisting of:

1. Discussion of the significant moments of their life (when digital storytelling is intended as a practical autobiography)
2. Participation in workshops in creative writing
3. Learning to use software for digital image manipulation.

These are the stages as adults, that our research group could take into account when we design the training of teachers, but also in the design of work with children.

PART 2

ANALYSIS OF DIGITAL STORYTELLING PRACTICES

1.1. Corpus of practices

Our research group collected 19 practices, which we attach (Appendix 1). Altogether, 14 from European contexts (Italy, Finland, Germany and Greece) and 5 from non-European contexts (Turkey and Australia).

These practices were documented and published between 2009 and 2016.

Practices are published in Journals and Books at the national or international circulation. Few practices are available only from internal documents and material in schools.

Below, the list of practices collected and discussed in the following sections:

1. Pesonen, A. & Salakari, M. (2015). Monimediaisen kirjan luominen ja käyttö päiväkodin arjessa. (*Creating and Using a Multimedia Book in the Everyday Life of a Daycare Centre.*) Bachelor's Thesis in HAMK University of Applied Sciences.
https://www.theseus.fi/bitstream/handle/10024/99468/Pesonen_Aino_Salakari_Minttu.pdf?sequence=1
2. Storycrafting using a computer. From Database of educational practices maintained by the Finnish Board of Education (practice submitted by the City of Tampere). <https://hyvatkaytannot.oph.fi/kaytanto/1628>
3. Animation workshop. From Database of educational practices maintained by the Finnish Board of Education (practice submitted by the City of Tampere). <https://hyvatkaytannot.oph.fi/kaytanto/1665>
4. The Ocean Project. In *Providing Creative Contexts: Educational practices on creativity in European pre-schools*. Italy: SERN, pp. 10-11.)
5. YÜKSEL, Pelin (2011). *Using Digital Storytelling in Early Childhood Education: A Phenomenological Study Of Teacher' Experiences*
6. Akbulut, M. T., Çiftçi, A., & Polat, E. E. (2013). Interactive design work with kindergarten children: "Bird house" digital presentation and practice. *Procedia - Social and Behavioral Sciences*, 83(4), 362-366.
7. KOCAMAN-KAROĞLU, Aslıhan (2015). Telling stories digitally: An experiment with preschool children *Educational Media International*, 1-13. DOI:10.1080/09523987.2015.1100391
8. KOCAMAN-KAROĞLU, Aslıhan (2016). *Teachers' Opinions about Digital Storytelling in Preschool Education (Okul Öncesi Eğitimde Dijital Hikâye Anlatımı Üzerine Öğretmen Görüşleri)*. Turkish Online Journal of Qualitative Inquiry (TOJQI), 7(1), 175-205. DOI: 10.17569/tojq.87166
9. Mancini I., Capraro A., Tanel G., "La tecnologia va nella Scuola dell'Infanzia? – Spunti dal progetto Tecnologie e processi di integrazione sociale", Università La Sapienza, Trento Uniedizioni, 2014.
10. Tava A., "i-Theatre for the development of narrative thinking and elements of efficiency in learning with new media", Faculty of Psychology, M.Sc. Thesis

- on Psycho-social disciplines, International Online University Uninettuno, 2015.
11. Bonaccini S., Prandi R., Albiero F., “*Narrazioni tecnologiche*”, Giunti Scuola dell’Infanzia (web)
<http://www.giuntiscuola.it/scuoladellinfanzia/magazine/articoli/narrazioni-tecnologiche/>.
 12. Best Practice Developed in the Seminar “Language Teaching and Learning with New Media” at the PH Karlsruhe in the Winter Term 2014/2015. Observation and Documentation of Best Practice (Not Published)
 13. Fthenakis, W.E. (2009). *Frühe Medienbildung*. Troisdorf: Bildungsverlag EINS.
 14. Lutz, K. & Struckmeyer, K. (eds.) (2010). *Erzählkultur*. München: kopaed.
 15. Create the animated version of a story using i-Theatre. Documentation into the school (not published)
 16. Expressive languages and storytelling. Documentation into the school (not published)
 17. Use I-theatre to set stories in real and imaginative gardens. Documentation into the school (not published)
 18. This is me: children teaching us about themselves through Digital Storytelling. (Kervin, Lisa; Mantei, Jessica) Practically Primary
 Publisher: Australian Literacy Educators' Association Audience: Academic
 Format: Magazine/Journal Subject: Education
 Copyright: COPYRIGHT 2011 Australian Literacy Educators' Association
 ISSN: 1324-5961; Date: Feb, 2011 Source Volume: 16 Source Issue: 1
 19. Shall we play with Elmer, the pied elephant?, *Mediterranean Journal of Social Sciences* Vol 4, No 11; MCSER Publishing, Rome-Italy October 2013

1.2 Exploration methodology

The collected material has been explored in order to gather information about the following themes:

1. Main goals of practices
2. Children age
3. Organisation of time
4. Organisation of space
5. Materials used
6. Technology involved
7. Narrative incipit
8. Strategies to develop the story and adult role in the educative process
9. Social dimension of the activities
10. The final product type
11. Main critical points
12. Impact on narrative competence

The first interesting information that has been obtained from the careful reading of the Description Forms is that not all the material initially collected is a practice of digital storytelling (19 is the number of collection practices, after having removed some). The analysis did not consider certain practices, sometimes because it did not use storytelling (e.g.: the construction of video documenting the construction of something), other times it involved students who did not fit in the range of age 4-6 years, other times because it was purely made up of experiments and therefore not a practice).

Overall, the descriptions are not totally self-explanatory of the teaching and learning process. Not all practices, in fact, have stated the same information: for example, some have focused on the description of the processes, of other products. Some had as a privileged focus the teacher and other children. We must note, finally, the presence of a few Description Form from which it is difficult to understand how the activities were organised, because they were too synthetic.

In the following paragraphs some practices will be used as examples of what will be discussed. They are to be understood as representative testimonies of aspects also present in other practices, not mentioned for reasons of space.

As you notice, **the practices were cited by indicating the number corresponding to them in the list of paragraph 1.2.**

You need to think about our body of practices as not as much representative of the educational-teaching models valid at all, rather about the multiplicity and variety of contexts, concrete and practical actions that teachers use - and therefore consider also useful - to "make digital storytelling" in preschool.

1.3 Results

1.3.1 Main goals of practices

In our practices there are different purposes of using digital storytelling with kindergarten children, although there are three frequent aims:

- to develop technological competences;
- to promote narrative skills;
- to enhance social attitude.

Design and experimentation of innovative educational practices with the ICT could be useful for the diffusion of ICT in school communities as tools to support teaching and learning.

For more than one practice the need for enhancing both educators' and learners' digital and mobile **technological competences** is a very topical issue; the other specific objective is to enhance the method of story crafting with the possibilities offered by the use of technology (and digital devices in a creative way) to create a multimedia story book/animated version of the story.

In other practices the main research goal is to investigate preschool children **motivation** and their involvement with the activities by a learning framework that combines raw material, experiential activities and ICT tools.

Creating an animation and producing a movie with a plot request to understand typical narrative structures and story elements (for ex. putting events and emotions in a timeline).

Another frequent aim of these practices indeed is to familiarise children with the narrative structures of stories and fairy tales: how can the DST approach support the development of **narrative competence**? Using DST as a tool to develop logical narrative skills, narrative thinking, writing and typing skills, could provide an increment of children's inferential and metaphorical narrative competence, although even of creative competence to invent an original story (ex. invent real and imaginary stories).

Furthermore, the **language** is enforced in different ways. Another specific goal related to the narrative-language competence enhanced by using DST is to discover the existence of different expressive languages and make experience of them: use different languages to describe events, emotions, desires, etc., and tell stories using different expressive languages (graphical, digital, verbal...). One of the main purposes of our practices is to foster communicative skills through multi-sensory experiences, and not only through reading and writing, so to enhance children's individual oral language. In one of the practices the specific aim is to foster foreign **language literacy** with a special focus on vocabulary, grammar, and narrative abilities; another practise is used with the purpose to better understand children's learning preferences and strengths, so to look at the language development.

Another frequent goal of DST in kindergarten educational contexts is to enhance **social and collaborative** skills and learning. In almost all of the practices children are invited to work in small groups, and it is supposed children could learn from each other: crossing grade-level boundaries enables peer tutoring. In the same practices working in group enforce the construction and elaboration of group identity. These projects also have the purpose to develop a more specific social attitude to listen to other children's stories, and then elaborate and integrate them, by thinking and speaking, so as to develop a more specific learning attitude.

In other practices, less frequently than in previous purposes, the main research goal is to investigate preschool children **motivation** and their involvement with the activities by a learning framework that combines raw material, experiential activities and ICT tools.

Creating an animation and producing a movie with a plot request to understand typical narrative structures and story elements (for ex. putting events and emotions in a timeline).

In another practice the aim was to compare the student's **conceptual understanding of course content** in a DST classroom with the understanding of a traditional storytelling class in kindergartens.

In one of the practices the research goal is also to investigate **children interaction and children-teacher interaction** during the digital story development process because the assumption is that Digital story development promotes children's interaction as well as with their teacher.

One exceptional aim of another practice is to impart architectural skills and knowledge to the children to enable them to become individuals with **sensitivities** towards the cultural and natural world they live in.

1.3.2 Children age

More often the practices of digital storytelling you collect are done with children of 6 years of age, which in some countries of the Project Partner correspond to the age of the last year of preschool (practices collected no. 7, 5, 3, ...).

However, a large number of practices has been done with children 5 years, age corresponding to the last year of preschool for other Project Partner (practices no. 8, 15, 18, ..).

Other practices took place in a range of age that corresponds to that of preschool: in the range of 3-5 years (practices collected number: 6, 9, 17, ..), in the range 4-5 years (practices no. 10, 11, 14) and in the range 4-6 years (practice no. 13).

It highlights the preference to involve children in the practices of the last years of kindergarten.

In contrast, only one practice said to involve children 1 to 5 years, (practice no. 4) including the children of the nursery.

In two practices, they comparisons and discussions were planned between children of 6 years (pre-school) and children of 7-8 years (primary school) (2, 3).

	Practice aimed at children (age in years)						
	1-5	3-5	4-5	4-6	5-6	5	6
Frequency	1	4	3	1	1	3	6

Tab. 1. The table shows the children age at which collected practices are addressed. The frequency is given for each age, corresponding to the number of practices which indicate that age.

1.3.3 Organisation of time

The organisation of the time in a DST project presupposes the length of the project and the articulation of the time in the activities. For some practices there is no explicit description of how much time they took, but some relevant points can be inferred from the text.

It emerges that three projects configured a sort of one-year experimentation (practices no. 8, 9, 10); one project was a six-month experimentation (practice no. 11), and another one took three-months (practice no. 13). Between 6 weeks and 8 weeks we collected two experimentations (practices no. 12, 14), between 3 weeks and 4 weeks (one month) we collected three experimentations (practices no.: 15, 17, 19). Only one project was two lesson-long (practice: 2), and 7 projects do not explicitly mention the duration of the whole activity (practices no. : 1, 3, 4, 5, 6, 7, 18).

	Time: Project						
	<i>Not Explicitly mentioned</i>	<i>1 year</i>	<i>6 months</i>	<i>3 months</i>	<i>2 months (6-8 weeks)</i>	<i>1 month (3-4 weeks)</i>	<i>2 lessons</i>
Frequency	7	3	1	2	2	3	1

Tab. 2. The table shows the duration of the experience described in "Description forms". The frequency is given for each duration; this corresponds to the number of practices which are related to that duration.

Looking at the number of sessions planned for each project, it emerges that in 11 experimentations we do not have the exact number of the sessions (practice no. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13). In four practices is made explicit the number of the sessions: 2 lessons in the practice no. 2, 4 sessions for the practice no. 15, 6 sessions for the practice no. 12, 8 sessions for the practice no. 14, and around 12 sessions for the practice no. 16 (once a week for 3 months). In the practice no. 17 is not possible to take note of the number of the session, because children were engaged to the monthly project every day at different times in different activities (around 20 sessions).

	Time: number of sessions					
	<i>Not Explicitly mentioned</i>	<i>2 sessions</i>	<i>4 sessions</i>	<i>6 sessions</i>	<i>8 sessions</i>	<i>12 sessions</i>
Frequency	11	1	1	1	1	1

Tab. 3. The table shows the number of session that composed each experience described in "Description forms". The frequency is given for each category; this corresponds to the number of practices which are related to that category.

It is also useful to figure out how long are the activities included in our practices. The most frequent duration is 40 minutes (practice no. 2, 7, 16, 17). Two experiences planned sessions of about one hour and a half (practice no. 12, 14),

just one had 60 minutes sessions (practice no. 15) and the shorter one was 20 minutes long (practice no. 6).

	Time: duration of each session				
	<i>Not Explicitly mentioned</i>	<i>20 minutes</i>	<i>40 minutes</i>	<i>60 minutes</i>	<i>90 minutes</i>
Frequency	11	1	4	1	2

Tab. 4. The table shows the duration of each session in the experience described in "Description forms". The frequency is given for each session's duration; this corresponds to the number of practices which are related to that duration.

Examining the most detailed descriptions of the activity time, we can have a more precise idea of the organisation of the time in good practices of digital storytelling. Practice no. 15 was composed of four one-hour lessons on four different days; practice no. 16 consisted in 40 minutes lessons once a week for 3 months; another one, the no. 17, was a one-month experimentation divided into 40-minute sessions. The practice was held **once a week for 1.5 hours** for six weeks, and the project comprised a total of **nine hours**; practice no. 14 lasted for **eight weeks** engaging **1.5 hours per day**: teachers and children spent one day a week without working on the project, which makes a total of **48 hours**. The shorter one included two lessons of approximately 90 minutes, and it is described in the practice no. 2.

There are two interesting features on the organisation of time that emerges as relevant in two of the practices but that could be generalised to the others:

- there should be enough time for creating and using the tools, and for revising the final product;
- the timing of the activity should be carefully chosen (e.g., not doing the activities in a very busy time of the year so that the activity will not get interrupted or disturbed).

1.3.4 Organisation of space

There are some important aspects on the organisation of the space in a DST project emerging from the practices' collection:

- Teachers underlined the importance of preparing a proper educational setting for DST experience;
- The most frequent space used to implement the DST was the classroom;
- Children are free to access to the proper environment;
- The environment should be interactive.

In some practices there is no explicit description of them but some points can be inferred from the text:

- There should be spaces that are conducive to working in small groups;
- Flexible use of spaces (for instance, one kindergarten teacher points out that many activities happen on the floor);
- Possibility to move around the building (or even outdoors);
- If the group of children is big, it is better to divide the group in two. This requires two different classrooms/spaces and supervising teachers (practice no. 2).

In some practices the description of the organisation of the space is very detailed, and it is useful to focus on the same features that define the environment management. In the practice no. 3 the teacher creates three animation points in the classroom, and each of these activity points consists of a background (built using e.g. screens / room dividers, sheets, children's drawings etc.). In the proximity of the animation points, there are diverse materials and objects available for creating the setting of the animation. In the practice no. 6 the presentation of the story (the first stage) was made in a room measuring 3 by 3.5 meters with a computer and data projector. Children were arranged in a semicircle opposite to a white wall on which the presentation was projected, and were allowed to get up and take part in the presentation as they wished. Presenters stood beside the slide projections on the wall to maintain eye contact with the children and respond to their questions to provide an interactive environment.

The organisation in practices no. 9, 10, 11 required the creation of a laboratory space for DST with the i-Theatre instrument, typically in continuity with other

laboratory spaces (*e.g.*, for drawing, painting, recreational space). Another important setting comes from practices no. 15, 16, 17: all the activities were carried out in the “mini-atelier” (part of the classroom dedicated to arts and creativity), where an I-theatre had been placed to create a digital-narrative setting. Children were free to access the book corner and use the classroom personal computer for image search, the kitchen garden in the school park for observation and research, the atelier or classroom for drawings. In these projects two teachers/educators worked along with small group of children (no more than five) in different spaces to develop their stories and to create the material required for their stories; the I-theatre was placed in a separate space where the groups entered for the production of their stories. In practice no. 5 the study included more than one digital storytelling activity and according to the nature of each digital story several spaces were used or organised, such as the entire school or the classroom, garden, performance hall, or fitting room of the school. In practice no. 18 children were allowed to move in the accessible environment (inside and outside), and they could decide on their own the subjects of the photos to take. At least, even the kindergarten classroom might be the proper environment for a DST project, though considering it needs suitable organisation and materials.

1.3.5 Materials used

A DST project could involve a various amount of materials (for material we mean objects which have been employed for the realisation of the digital story, with the exception of the technologies). In our practices the most frequently used materials are drawing and painting materials, picture books and illustrated books. **Picture books** were used as a basis for the digital stories created by the children (practices no. 4, 9, 10, 11, 12, 15). Some children used the picture books’ illustrations for their digital stories, others produced their own illustrations using **crayons** on **blank paper**. Several drawing and painting materials (paper, pencil, colour paint, permanent markers, acetate paper, cardstocks, temperas etc.) (practices 3, 4, 5, 7, 8, 12, 13, 15, 16, 17, 19) were used by both children and teachers to create scenarios, in the process of drawing pictures that represented the story, in combination with toys and puppets and real objects for

dramatisations. Drawing materials are also used frequently for creating storyboards of existing fairy tales before the actual story crafting session and/or for creating pictures of the characters if the finished fairy tales are later transformed into animated videos. To create the story some children also used **musical instruments** (practice no. 12). Furthermore, in practices no. 12 and 14 the children received **templates for drafting the story maps and storyboards**. It was also allowed to use different materials, from nature and from the school, structured and not structured: raw materials such as plastics, ropes, coloured pebbles or pieces of glass (practices no. 16, 19); materials for experiential activities-dramatisation (practice no. 19); materials from nature (pinecones, leaves, stones, etc.) (practice no. 6) and materials available in the school (buttons etc.) (practices no. 6, 16, 19). **Various toys are used** (e.g., Lego blocks, dolls, stuffed toys, building blocks, etc.) (practices no. 1, 2, 3, 5, 19): in no. 19 the toys were used as items of the children's stories to represent the characters if the finished fairy tales were later transformed into animated videos. In practices no. 16 and no. 17, children used pictures and images of different subjects to build their own story or to tell the story.

	Materials						
	<i>Toys</i>	<i>Drawing and painting materials</i>	<i>Book</i>	<i>Photos and images</i>	<i>Musical instrument</i>	<i>Articles from nature</i>	<i>Other Articles</i>
Frequency	5	11	6	2	1	1	4

Tab. 5. The table shows the materials used in the experience described in "Description forms". The frequency is given for each material; this corresponds to the number of practices which are related to that material.

1.3.6 Technology involved

The technology supported the process of digital storytelling in a great range of manners. The most frequently used tools were a **digital camera** (practices no. 1, 2, 3, 4, 5, 8, 13, 14, 15, 17, 18, 19) and a **data projector** (practices no. 2, 4, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 19).

The **Digital Camera** is easy to manage for children and allow images to be easily captured and then immediately reviewed. In the collected practices it was mostly used by the children to take photos, but it was also used by adults to take photos and record videos during the activities, to take photos of the drawings of children which would have been placed in the digital stories. A separate mobile camera was generally used, digital camera or video camera, but also a built-in camera in a tablet or a webcam attached to a computer. Surely, the other common and essential tool for a Digital Storytelling context is the **computer** (practices no. 2, 3, 6, 7, 14, 15, 19), thus connected to the Internet, or a laptop, or a tablet (practices no. 1, 3). The PC is used to browse photos and images not available on books; **software/apps** are used in order to create the animated story using backgrounds and drawn characters, with a video-making tool such as MovieMaker, iMovie, JPGVideo, Quicktime movie, Vegas Pro 11 video editor, MonkeyJam, etc., for editing the photos into a video (practices no. 3, 5, 8, 13, 14, 18, 19). For example, the BookCreator app is meant to create a multimedia book about a story told by children using images created with the camera in order to illustrate their stories. The Computer, or a tablet device, could be equipped with word **processing software** so that children (working in pair) could type out the story (practices no. 2, 16), even using PowerPoint Presentation to develop and play the story (practice no. 16). Very often **the Voice recorder** (ex. Audacity) (practices no. 5, 13, 18) is used to add sound elements to the digital stories, to create soundtracks/audio materials: the final video can indeed also include dialogue, sound effects, and/or background music, and in some practices (n. 14, 19) it is also used a **microphone**.

The **projector** (practices no. 2, 4, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 19) can project the images that were being elaborated on the screen and create stimulating and immersive environment, encouraging observation, interaction with images and cooperative construction of the story. It is to let the group see on the wall the animation they were creating. In one practice the overhead projector is used to project characters and compose materials to detail the story's backgrounds and the light table is used to draw characters and make three dimensional creations with unstructured materials, and to create the animated story with characters and texts PowerPoint is used. To create the animated version of a story in our

practices it is possible to use a combined and fine tool as mentioned above, **the I-theatre** (practices no. 9, 10, 11, 12, 15, 17). It is a multi-touch digital device that allows image animation to be generated; it's equipped with a scanner, an ambient microphone and it is connectable to a projector. I-theatre is used to acquire images, edit them and create a short movie of the original story moving characters on backgrounds.

Other tools are the **scanner** (practice no. 19) and the **printer** (practice no. 2): the first one digitalises the materials, the second one is a tool for printing out the finished stories and/or displaying to the class on the wall, so the children can read their stories to others. A printer may not be necessary if a projector (or a tablet) is used. Other tools used in the experimentation collected are the light table (6), to draw characters and make dimensional creations, and the USB flash-drivers.

	Incipit													
	C	T	PC	W	P	PR	V	D	R	I	U	M	L	S
Frequency	12	2	8	2	13	1	7	1	3	6	3	2	1	1

C= Camera
T=Tablet device
PC= PC
W= Word processing software
P= Data projector
PR= Printer
V= Video-making tool
D= Digital photo frame
R= Voice recorder
I= I-theatre
U= USB flash-drives
M= Microphone
L= Light table
S= Scanner

Tab. 5. The table shows the technologies used in the experience described in "Description forms". The frequency is given for each technology; this corresponds to the number of practices which are related to that technology.

1.3.7 Narrative incipit

Very often, the adult has provided the children the theme on which to develop the story. This theme or opening words (incipit) can be more or less structured and precise.

Sometimes, it was required to give a *digital format* to familiar (known) stories or songs (practices collected no. 15, 9) (this was not strictly digital storytelling).

Other times, however, the children were invited to invent new stories from some familiar (known) stories because already read (practices no. 12, 19), to build

stories using cartoon characters (practice no. 14), or to invent a fairy tale after exploring and knowing the fairy tale genre (practice no. 2).

In other cases, the children were asked to tell "their personal" story: to introduce themselves and to present what they liked to do (practice no. 18), to tell their day at school (practice no. 9) or to invent the adventures of a toy for their interesting (practice no. 1).

We found often documentation about the practice of inviting children to build stories about an environment and their "inhabitants" (the ocean –practice no. 4-, the school garden –n. 9-, the vegetable garden -n. 17-, the human body -n. 14-)

In one practice (n. 3), the story is invented from abstract themes proposed by the adult, such as friendship

Finally, there are practices in which the stories were built by children from the drawings they had done previously.

	Incipit						
	<i>Digital format to familiar text</i>	<i>New story from familiar story</i>	<i>Personal story</i>	<i>From the knowledge of the fairy tale genre</i>	<i>Environment and "inhabitants"</i>	<i>Abstract theme</i>	<i>From pictures</i>
Frequency	4	5	3	1	4	1	3

Tab. no. 6. The table shows the type of incipit for the invention of the story in the collected practices d. The frequency is given for each type of incipit; this corresponds to the number of practices which indicate that incipit.

1.3.8 Strategies to develop the story and adult role in the educative process

Often, but not always, the practices collected by us starting with a phase about initial knowledge, that is, a first stage of the activities in which children acquire initial knowledge necessary to the next invention of stories. Sometimes, this knowledge they are placed on the level of *technological expertise* (practices collected no. 6, 3, 12, etc). Other times, they are about the theme-content-core against which the story was later built. Such content was reactivated with brainstorming (practices no. 8, 9, 13), or the children were invited to explorations of different aspects of the content (practices no. 6, 17), or the content has been provided by the adult, for example through the reading of books (practices no. 19, ..).

The practices differed as for **order processing of visual and verbal part**. In some of them, the verbal part was built before the visual one (practices no. 1, 9, 10, 14, etc.), in others it was vice versa (practices no. 4, 5, 8, etc.).

Often, the sound part is the last to be built and inserted in the digital product (practices no. 18, 8, etc.).

This reflection binds to the **phase of the plan-design story**. Sometimes, the story was designed before the construction of the visual component (practices no. 9, 3, 14, etc.). Other times, the story was invented starting from images collected or drawn by the children, with the teacher's guidance (practice no. 5). Finally, other times the images of the characters were built first, then the story was created (spontaneously) playing and interacting these characters (practices no. 4, 8, etc.). Similarly, there are some practices in which the images were digitised and projected on the wall. In this immersive context, some children moved these images on technology and indirectly on the wall and others were creating shadows on the wall, generating interaction with the different characters and objects (practices no. 11, 15, 17).

There are practices in which the **teacher wrote accurately** the story as it was being invented by the children to re-read the same (practices no. 1, 9) giving rise to the revision occasions by children.

Even in other practices you recognise **moments of revision** in progress on the part of the working children (practices no. 2, 12, 19, etc.). In one practice, the adult discusses with the children the story invented to facilitate their review (practice no. 3).

During the plan-design phase of the story, we recognise two modes of adult action. In some practices, they emphasise the presence of a teacher showing a **non-judgmental attitude** (practice no. 1) a teacher who leaves the children free in the invention of the story. He does not provide children with the constraints, or he provides children a few constraints and open topics. In other practices, you see the presence of a **teacher that guides loosely** - for example with open questions - the children of the invention work (practices no. 3, 5, 13, etc.).

In most practices, the adult has the **role of supervisor**, one who has supported children's processes and interactions between them (10, 11, 15, etc.).

There are practices in which the teacher's intervention was significant in the working phase **with the technologies** (3, 5, 14).

Only three practices have stated that during the activities the adult has also **observed** children and their act (15, 16, 17).

In some practices, finally, the teacher **has prepared the environment and the materials** before making didactic proposals with children (15, 16, 17).

Some practices were concluded with the presentation and viewing of the final digital product to a group of children or adults who have not participated in the process (1, 12, 19).

	Phase of design/project				At the end, vision of the story in the big group
	Verbal-visual-technology	Visual-verbal-technology	Play with characters-technology	Contemporary	
Frequency	9	3	2	5	3

Tab. no. 7 The table describes how the main communication channels (verbal, visual, technology) they are organised in time during digital storytelling practices. The dash is to be read as a "then".

	Adult role			
	Before, prepare the environment and the materials	Observe children during activities	Foster the revision of the story by children	Supervise the children during activities
Frequency	3	3	7	6

	Adult role			
	Use guiding questions	Non-judgmental	Write the story and read	Help consistency in

		<i>attitude</i>	<i>to children</i>	<i>the use of technologies</i>
Frequency	5	1	5	4

Tab no. 8 The table shows the main tasks performed by the adult. The sum of the frequencies is not 19 (the total number of the practices collected) because in the same practice, the adult can perform more tasks. It should be remembered that only the actions of the teachers declared in "Description form" were counted. This means that the teacher may have done more actions than those written in "Description Form". Actions not explicitly written have not been counted.

1.3.9 Social dimension of the activities

The largest number of documented practices we presented organisation in small groups of children, often composed of 4-5 persons (practices collected number 3; 12, 14; ...), sometimes heterogeneous by age (practices no. 3, 8), other times homogenous (practice no. 4).

Less frequently, the children worked in a medium-sized group (8-12 persons) (practice no. 8).

Only in one practice, the children built the story individually (practice no. 18). This choice seems to have been motivated by the the request of the adult to children to invent a story that described them.

There are practices where there is an alternation of working dimensions: individual invention of story and revision in pairs or in small groups (practice no. 1), or the large group invents the core of the story, then small groups (or pairs) of children develop their own story and at the end each small group (or pairs) tells their story to the big group (practice no. 2), or small groups or pairs of children work, compared with a large group (practice no. 5). Only in one practice, the group invented the story, then the group was divided into three small groups that built the digital version of a part of the common story (practice no. 9).

	Social dimension of activities			
	<i>Small group</i>	<i>Medium group</i>	<i>Individually</i>	<i>Alternation of social dimensions</i>
Frequency	11	4	1	3

Tab. no. 9 The table shows the type of Social dimension of activities of digital storytelling. The frequency is given for each type of Social dimension; this corresponds to the number of practices which indicate that type of Social dimension.

1.3.10 The final product type

The final product is a digital story. Final products are different for different technologies and materials used in the process of DST, as well as for the main purposes of each project.

Some of the final products were defined as:

- A digital story (practices no. 4, 8, 12, 18, 19)
- Stories illustrated by children (practice no. 17);
- a multimedia book telling a story built around a favourite toy of the child (practice no. 1);
- a short fairy tale/story created by the pairs of children (practice no. 2);
- a short (1-2 minutes) animated video clip that includes a small-scale story arc. The video can also include dialogue, sound effects, and/or background music (practice no. 3);
- the movie of the whole story animated on I-theatre (practice no. 15);
- the PowerPoint presentation (story with animated characters and texts) (practice no. 16);

1.3.12 Main critical points

The most frequently reported difficulties were about the use of technology, both because teachers declare that they have insufficient technology skills, both because children are not autonomous in their use (practices collected no. 5, 8, 12, 14, 16).

Then, there are difficulties of organisational and educational nature. In some practices the need (and difficulties) to work with children on digital storytelling with longer and continuous time is emphasised (practices no. 1, 5, 15). In other practices, difficulties in organising small group work are highlighted (practices no. 5, 9).

	Critical points about
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	<i>Use of technology</i>	<i>Organisational aspects</i>
Frequency	5	4

Tab. no. 10 The table shows the critical points of the digital storytelling practices detected in "Descriptions form".

1.13 Impact on narrative competence

Not all partners have responded to the question "How/In what sense the practice fostered children narrative competence?"

Respondents emphasised primarily these elements:

- The activity and the materials that were produced provided a context for continued spontaneous narrative play even after the animation itself was finished.
- The story creation developed the children's imagination.
- The practice focused on familiarising children with the narrative structures of stories and fairy tales, and developing their skills in creating a logical narrative.
- The children generated and also reflected on language, which supported them in enhancing their lexical and grammatical skills.
- Telling stories in a group helps children (particularly when they are of different ages) to enrich their vocabulary.
- Children acquired the skill to identify the key-points of a story and put them in a chronological order. They also learned how to connect characters and backgrounds.
- Through storytelling, children made comprehensible and communicable both their experience and their desires. Narrative thought enabled them to organise personal and interpersonal experience, while narrative speech supported reflection.
- Thanks to the activities, children "put in order" and made sense of their experience, giving it a concrete shape that made it easier to communicate and remember.
- Children were emotionally engaged in the stories and they tried to make sense of every action they described. It was a collaborative activity, because there were both narrators and listeners.

- Narrative competence was fostered in different ways and with different activities; telling the story and predicting the development and the end of it (different versions); narrating and putting together the elements from the story and from personal experiences; building the storyboard, selecting important frames in agreement with the whole group; using different ways of expression.

Conclusion

Digital storytelling is an interesting strategy to be used from pre-school years, mainly to encourage digital and narrative competency in children. The theoretical framework provided in the first part of this Manual Book allowed us to explore two key words inherent in digital storytelling: medialiterary and narration.

Medialiteracy, because digital storytelling implies the use of technology. From a very early age, despite regularly using and interacting with technology, young children do not possess digital competency as an inborn skill. To promote it means forming individuals who will be able to use technology independently, critically, functionally and intentionally. This is a strategic educational objective which is part of the broader skill set referred to as active citizenship.

Narration, because it is a part of digital storytelling. Storytelling has two sides to it. On the one hand, it means listening to stories being told. For instance, the many occasions children have to listen to adults telling them stories. Stories provide an opportunity to interact with an adult, to feel emotions, and to know and experience the world in an indirect, and safe way. On the other, the word storytelling also refers to the making up of stories. Constructing stories is a "natural" thing to do for humans, in virtue of the narrative thinking we possess and which allows us to explain and understand our world, as well as to organise knowledge using the narrative form.

The Erasmus+ STORIES project intends to use this second definition of storytelling in order to promote digital and narrative competency. Children will be asked to make up stories. This task, in constructivist terms, requires children to rework the data they possess about the real world. Making up stories means activating knowledge and using materials to build new narrative sequences. The process allows children to acquire new knowledge about the world and/or to consolidate the knowledge they already have. Moreover, it enables them to acquire or consolidate their skills (digital and narrative) through action. Ausubel would call this process "learning by discovery"(as compared to mechanical learning).

As discussed earlier, children are competent storytellers thanks to the narrative thinking skills they can draw on and which emerge through symbolic play. When children play at doctors, for example, they are making up a story. In Vygotsky's idea of creativity, making up stories is also a creative act, because to do it children have to combine the things they know to create something new. This invention has to happen within given boundaries, namely those regarding the organisation of grammar in stories. So, making up stories is an open task which allows children to act freely (the freedom to make up any plot they want) but within a number of restrictions framing thought and action.

Digital storytelling is therefore the practice of making up stories and telling them in more than one language: verbal, visual, audio and digital.

An exploration of literature on the subject provides several useful recommendations for teaching when the goal is to offer digital storytelling programmes in kindergartens. Firstly, the context must be appropriately organised, namely, the time and space within which the activity takes place. Several authors call for children-centred teaching in which the protagonists of the activity are children and the adults acting as directors, supervisors and facilitators. Adults can support the actions of children through trigger questions. They should be accepting and not judgemental. They should also give children multiple opportunities to reflect on the stories they make up. Several scholars point to the importance of exploiting the creative and narrative potential of symbolic play that is typical at preschool age, as well as having children work together in co-building stories.

The 19 digital storytelling best practices collated and examined in the second part of the Manual Book all remain fairly close to the guidelines provided by scholars of the subject. The best practices were gathered from European and non-European contexts and published between 2009 and 2016.

They were primarily conducted in order to promote technological, communication (narrative, linguistic or sometimes even a second language) and social skills.

Generally-speaking, they were carried out over long and extended periods (more than three months) in both open and closed spaces. In some cases, they were carried out in specific spaces: workshops set up specifically to perform digital

storytelling. In most cases, they involved small groups of children who were asked to make up new stories based on stories they already knew (such as Elmer or folk tales) or popular contexts (the sea and the things living in it). Often, the children were asked to think up the theme of the story first then produce the visual part (drawings, photos, etc.), and only at the end to combine the two using technology, in order to make the story digital. The technologies used most often were digital cameras, both for taking photos and making videos, computers with videomaking tools, I-theatre, which combines a variety of technologies (to elaborate both visual and audio content) and an overhead projector to show the children the stories produced during and at the end of the process. Adults often acted as supervisors and the children were given multiple opportunities to reflect on and modify their work.

The teachers leading the programmes discussed the difficulties they encountered on organisational issues (time and space) and their own limited technological skills. It was, therefore, clear that, in order to support and coordinate children's digital storytelling, teachers need to know more than just how to make up a story. The more training is provided to teachers the more effective digital storytelling activities will be; when adequately prepared, teachers could not only explain the character and specific nature of the storytelling, but also move more freely in digital worlds, use multiple languages and solve organisational problems regarding time and space.

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