

COGITO ET DISCERE LUDENS. TRAINING COURSES IN PRIMARY EDUCATION SCIENCES
COGITO ET DISCERE LUDENS. PERCORSI FORMATIVI IN SCIENZE DELLA FORMAZIONE
PRIMARIA



Double Blind Peer Review

Citation

Tripaldi, M., Ricciardiello, G., & Colavito, F. (2025). Cogito et discere ludens. Training courses in primary education sciences. *Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva*, 9 (1).

Doi:

<https://doi.org/10.32043/gsd.v9i1.1484>

Copyright notice:

© 2023 this is an open access, peer-reviewed article published by Open Journal System and distributed under the terms of the Creative Commons Attribution 4.0 International, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

gsdjournal.it

ISSN: 2532-3296

ISBN: 978-88-6022-509-2

Mariella Tripaldi
Università degli Studi "A. Moro" di Bari
mariella.tripaldi@uniba.it



Giuditta Ricciardiello
Università degli Studi "A. Moro" di Bari
giuditta.ricciardiello@uniba.it



Flora Colavito
Università degli Studi "A. Moro" di Bari
flora.colavito@uniba.it



ABSTRACT

The present study explores the Best Practices experienced by SFP students in Bari engaged in a workshop training course focused first on the construction of teaching interventions starting from picture books, transformed into opportunities for mathematical learning in a playful way. These experiences were then applied to the design and creation of interactive and inclusive digital books, to support an equitable and accessible education. Finally, space was given to evaluation as a formative process oriented towards metacognition.

Il presente studio esplora le Best Practices esperite dagli studenti di SFP di Bari impegnati in un percorso formativo laboratoriale incentrato sulla costruzione di interventi didattici a partire da albi illustrati, trasformati in occasioni di apprendimento matematico in chiave ludica. Tali esperienze si sono successivamente concretizzate nella progettazione e realizzazione di libri digitali a supporto di un'educazione equa e accessibile. Infine è stato dato spazio alla valutazione come processo formativo orientato alla metacognizione.

KEYWORDS

Meaningful learning, playful teaching, digital storytelling, formative assessment, teacher training.

Apprendimento significativo, didattica ludica, storytelling digitale, valutazione formativa, formazione docenti.

Received 01/05/2025

Accepted 17/06/2025

Published 20/06/2025

Introduction

Storytelling is the quintessence of human tradition; lifeblood flowing through generations linking the past to the present and prefiguring the future, it is the only stable medium through which traditions, values, emotions and culture are continuously passed on (Prusak et al., 2012). Through narration, man gives meaning and significance to the set of events, which would otherwise remain a mere succession of facts, and outlines interpretative and prefigurative coordinates of events, actions, situations, and on this basis builds new forms of knowledge (Piaget, 1954) that guide him in his actions.

The training intervention aimed at a group of 134 students of the CdL in Primary Education, future teachers of Nursery and Primary Schools, during the A.Y. 2024/25, was considered indispensable precisely in order to design interventions aimed at constructing new knowledge - related to mathematics - through digital storytelling to be installed in learning environments functional to the achievement and evaluation of the set objectives.

1. Ludendo docere as an educational issue

'Ludendo, docere' is an educational principle rooted in the ancient Latin tradition. It embodies a vision of teaching based on the active involvement of the learner, on his or her motivation to learn, through activities that stimulate the most emotional part of the learner. Already Vygotsky and Piaget, the main exponents of the constructivist view of learning, emphasised the crucial role of practical experiences and play in the process of acquiring cognitive skills, considering learning as a process of a social nature.

In an educational context such as the one just described, in which pupils are personally involved in the process of constructing their knowledge, it is believed that reading an illustrated book can be counted among the 'playful' activities: listening to a story can stimulate attention, activate critical thinking, trigger a creative process and the construction of knowledge.

Associating the idea of reading an illustrated story with learning Mathematics might seem distant from what is traditionally thought of as a Mathematics lesson. Since the earliest times, in truth, the art of storytelling has represented the first and most spontaneous form of 'learning' as an instinct of the social animal called Man (Gottschall, 2014). For this reason, it is believed that resorting to storytelling to

introduce and construct a mathematical concept, right from the earliest primary school classes, could appear to be a winning choice.

The methodological choice of introducing mathematical concepts through the reading of illustrated books is nothing new: there are rich bibliographies of books and stories for school-age children and young people that deal with mathematical topics in a scientifically correct manner, according to the epistemological foundations of the discipline and the correct representations in accordance with the principles of the Didactics of Mathematics (Demartini & Sbaragli, 2024). Furthermore, the idea that Mathematics can be taught through narrative is central to much of the literature devoted to the teaching of Mathematics over the past 20 years. In particular, in the text *Teaching Mathematics as Storytelling* by Rina Zazkis and Peter Liljedahl (2009), the authors point out that the mediation of narrative texts allows the approach of difficult mathematical concepts, actively involving students in the process of constructing mathematical meanings, while at the same time fostering a deeper understanding of them. At the same time, they highlight the great potential of storytelling on an emotional and psychological level, fostering memorisation, increasing motivation and involvement, strengthening a sense of cohesion and creating empathy (Zazkis & Liljedahl, 2009). With reference to the use of narration during a mathematics lesson, narration can serve to make memorable a concept that, if introduced by a 'dry' theoretical explanation would risk not being understood, nor retained in memory. Last but not least, the playful and entertaining aspect, which, generally, rarely appears in the educational context, can represent an added value in a learning environment that thus becomes productive and creative (Zazkis & Liljedahl, 2024).

The innovative aspect in this work is dictated by the choice to use the narrative approach during a training course for future teachers, with students of Primary Education. In such a training context, the reading of a story to introduce and develop a mathematical concept acquires a twofold value: on the one hand it is an activating element of interest, attention and motivation in the audience of adult students, just as it is for the youngest ones; on the other hand it becomes a moment of meta-training, since it initiates the students into a path of reflection on various aspects involved in the professionalism of the teacher's figure. The future teachers find themselves, in fact, reflecting on specific contents of the discipline and their relevance from an epistemological point of view, on the most effective didactic and methodological choices, as well as on the importance of the planning phase of a vertical didactic path, structured by competences. Such a complex vision

encompasses, according to Sierpiska (2004), the most relevant responsibilities of the teacher in the field of Mathematics didactics.

Numerous studies have shown that the effectiveness of Mathematics teaching does not depend exclusively on pedagogical content knowledge (cf. Pedagogical Content Knowledge according to Shulman, 1986) and the use of didactic materials or innovative strategies, but is deeply connected to the disciplinary knowledge aimed at teaching (Mathematical Knowledge for Teaching, MKT; Ball, Thames & Phelps, 2008), as well as to the epistemological knowledge of the discipline and the specific educational and didactic objectives that the teacher intends to achieve (for an in-depth literature on the subject see Even et al., 2009).

The teacher's skill, therefore, consists in identifying in a specific illustrated book the mathematical content to be taught, designing a pathway through the use of artefacts (according to Bartolini Bussi et al.'s Theory of Semiotic Mediation, 2008) appropriate and functional to the construction of the identified concept.

The training experience presented here consists of three modules:

1. From picture book to mathematical concept
2. Creating 'mathematical stories' through the DST
3. Metacognition-oriented assessment

1.1 From album to mathematical concept

The training intervention designed and implemented with a group of 134 SFP students saw in its first phase the reading of the illustrated book "Il Bruco Misuratutto" (The Measuring Caterpillar) by Leo Lionni, which acted as a hook between the mathematical ideas and the children's dimension of reality. The theoretical framework of reference for the design, implementation and analysis of the various activities is that of Semiotic Mediation Theory (TMS).

The overall aim of this story was to introduce the concept of measurement in a primary school class.

The story was read to the students, allowing them to directly experience the effectiveness of storytelling as a tool to convey the mathematical concept identified.

The story tells of a caterpillar who, in order to escape the evil intentions of a nightingale who threatens to eat him, declares his great skill, that of being able to measure all things. After demonstrating, through numerous examples, that he is able to measure the body parts of many animals, to escape his prey he tells him

that he is able to measure their song. He challenges him, thus, asking him to start singing and, slowly, he gets away among the blades of tall grass, managing to save his life.

After the reading, students, like the children, were involved in a workshop activity in which they were asked to create a caterpillar from a strip of coloured paper.

According to Semiotic Mediation Theory, this strip represents the unconventional unit of measurement. TMS emphasises how the use of appropriately chosen artefacts by the teacher can foster the construction of mathematical meanings and complex concepts. Referring back to the concept of 'artefact' and 'pattern of use' in Rabardel's (1995) vision, TMS highlights the value of the 'semiotic potential' of the artefact: the paper strip, during its use, brings out certain meanings and concepts that, initially individual, are transformed into collective knowledge through a mathematical discussion orchestrated by the teacher, for his or her students.

In our case, the paper strip, as yet unfolded, has great semiotic potential in terms of underlying mathematical meanings that can be evoked during the execution of tasks involving their use (Fiorentino et al., 2024). It will allow, through a series of folds, to become a measuring instrument, subdivided into submultiples, thus representing an unconventional unit of measurement.

In accordance with the TMS, tasks are proposed which, through questions, generate collective discussion and knowledge building at class group level. The strip is first folded in half and this action allows the teacher to work on the concept of halves, the idea of whole and equal parts. At the same time, the act of folding evokes the idea of dividing and puts the young learners in a position to observe how division generates two perfectly congruent parts (since they overlap).

Next, the act of folding is repeated, dividing the 'caterpillar' first into 4 parts (making half of the half) and then into 8, folding the quarters in half.

The caterpillar is reopened and observed: through properly designed questions, discussion with students brings out knowledge that is anchored in the mathematical objectives that are to be achieved.

This first phase is followed by activities involving the measurement of small school objects (pencil cases, pens, erasers...) and objects much larger than the whole caterpillar (desk, cupboard...). This experience highlights the need to use 'small pieces' as the smallest units of measurement to determine the size of objects smaller than the whole caterpillar, as well as larger fractions of the whole, with the caterpillar used several times to determine the size of a large object.

One can see how the folding activity is imbued with mathematical meanings that, with first-year pupils, lay the foundations for introducing numerous concepts, which will be gradually deepened through teaching interventions linked to this first experience: think of the concept of measurement, of units of measurement, of fractional units, of multiples and submultiples, of fractions greater than or less than the unit... As time goes on, the complexity of the topics also increases: the comparison between conventional and non-conventional units of measurement can then be initiated, the international system of measurement introduced and compared with other existing systems of measurement.

Any didactic intervention can therefore be designed to guide the evolution of mathematical meanings from the initial, personal ones to the more general, collective ones, which is the ultimate goal of educational and didactic intervention. In the light of all this, the choice of the illustrated book seems extremely important, in order to start a path of reflection and construction of concepts that, in the course of time, may gradually evolve towards an increasingly complex, abstract and formal knowledge.

In the training context with students of Primary Education, the workshop activity based on reading an illustrated book to 'do' mathematics and aimed at future pre-school and primary school teachers, has as its first objective the implementation of subject content knowledge (Ball's Mathematical Knowledge for Teaching, i.e. the fractions linked to the idea of measurement), the development of the ability to design meaningful activities in learning environments that are functional to the achievement of educational and didactic objectives, also taking into account transversal skills, so as to make students gradually aware of the complexity of the teaching profession.

2. The transformative furnace of storytelling

The rich tapestry of human history has been painstakingly embroidered with narratives that have been handed down for millennia; indeed, since the dawn of time, human beings have been keepers and disseminators of stories (Roig et al., 2018). Storytelling has always been the original medium through which knowledge, traditions and values are passed down from generation to generation (de Jager et al., 2017) defining itself as an original form of culturally sustainable pedagogy, embodying the essence of shared human experiences.

The superstructures of 'traditional' schooling often eliminate the capacity for storytelling, especially when related to mathematics, focusing on the absurd logic of the dichotomy between a 'left brain' that deals with logic and a 'right brain' that focuses on creativity, mistakenly separating mathematics from creativity and disassociating completely from storytelling (Geake, 2008) even though it is self-evident that mathematics is an art intrinsically linked to our capacity for storytelling (Zazkis & Liljedahl, 2009).

The transformative furnace of storytelling, regardless of topic, occurs during the moment of collective sharing, once around a campfire or, even today, around a table. The magic happens when individual narratives, through listening and collective feedback, metamorphose into a story for the community during the sharing that takes place in a *storycircle*.

This is what happened in the training course presented in this contribution. The methodological choice of introducing, deducing and developing mathematical concepts through the reading of an illustrated book first of all attracted the interest and motivation of the learners and, at the same time, allowed them to reflect and question themselves not only on how to design a didactic intervention but, above all, to understand how important it is not only to be competent in the concepts and constructs of the discipline but how fundamental it is to know how to use the most suitable methodologies, strategies and mediators to make each and every one understand a specific concept in a given learning environment.

After the reading of an illustrated book and the ensuing activities, we moved on to the creation of 'mathematical stories' through the digital storytelling (DST) methodology, highlighting and demonstrating how this methodology can be perfectly integrated into teaching practice as long as there is a balance between narrative creativity and scientific rigour.

To date, especially in the pedagogical/didactic field, DST is considered a multifunctional educational tool, the best existing union between the world of ancient written and oral narration and that of digitisation, videos, images, music and interactions, as well as one of the best methodologies for promoting and enhancing dynamic, non-linear, creative, participative, reflective and inclusive learning on the part of the learner, who thus becomes an active protagonist of his or her own learning process.

In education, DST is based on constructivist theories of learning, according to which students construct new knowledge based on prior knowledge (Piaget, 1954). This approach aligns with Vygotsky's social constructivism, (1963) according to which

learning is inherently a social process that takes place in the so-called 'zone of proximal development' and is enhanced through storytelling and the sharing of experiences. DST not only facilitates personal expression and creativity, but also promotes a deeper and more interactive form of learning. But the relevance of DST in education lies above all in its ability to engage in a deeply personal way and, at the same time, develop critical thinking and problem solving strategies while producing superior learning outcomes compared to traditional pen-and-paper storytelling methods (Ramalia, 2023). Furthermore, involving students in this type of activity, based on the use of multimedia, increases their motivation to improve their learning and performance (Muller et al., 2006) as well as to develop digital skills (Karakoyun & Kuzu, 2016). The use of DST in cooperative and collaborative learning contexts is, moreover, particularly useful for the development of prosocial, emotional and social-relational skills especially in learners with Special Educational Needs who often experience difficulties in communicating with adults and peers (Schmoelz, 2018). Multimedia learning, typical of DST, operates by immersion (one immerses oneself with several senses: sight, hearing, ...) thus favouring the various learning styles of each and everyone, thus making, this methodology highly inclusive.

In addition to supporting and engaging students, DST can help teachers 'save time and effort'. Some studies claim that teachers who use DST wisely make content more understandable and encourage their students to be more autonomous. As Robin (2016) suggests, digital stories created by the lecturer can also be used to enhance ongoing lessons within a broader UdA, as a way to facilitate discussion on the topics presented or as a tool to make abstract content or more complex concepts more understandable. Furthermore, digital storytelling offers teachers a unique way to present new content by facilitating all students to understand difficult concepts, becoming a bridge between prior knowledge and new concepts to be acquired (McLellan, 2007).

2.1. Creating mathematical stories: the Digital Storytelling workshop

Faced with the complexity of the new educational scenarios (Morin et al. 2017), influenced by continuous and unprecedented changes, DST represents a valuable working tool to design quality educational experiences accessible to all and each (Cottini, 2019; Canevaro and Ianes, 2022). In recognising and accommodating the heterogeneity of everyone's special needs, the adoption of DST, understood as a

multidimensional educational language (verbal, graphic, musical, etc.), becomes a fertile educational opportunity to promote the development of everyone's abilities, different skills and autonomy (Persi and Montanari, 2021). Aware of this and of the importance of training future teachers prepared for the complexity and sudden changes that school and society impose on us, we have moved on, as mentioned above, to the creation of 'digital mathematical stories' by positioning the *storycircle* as an inviting space for collaboration, to generate, define and collectively revise mathematical stories by looking at the intricate and delicate process of acquiring mathematical concepts through the inputs of a story that may not even have explicit mathematical references.

This part of the workshop was divided into modules:

1. Mathematics in our everyday life: In this phase, after participating in the reading of the mathematics picture book and the implementation of related activities, students divided into randomised groups reflect on how the essence of mathematics can manifest itself at home, at university, in the street, etc. This phase is crucial because it helps them to see the ubiquity and relevance of mathematics in their daily lives.

2. Drafting and sharing an outline: students in each group, once they have identified the target audience (pre-school or primary school with their classes) and the objectives to be achieved, create a rudimentary outline, a plot, centred on mathematics. This story is then shared with the other groups in a Storycircle where each group leader tells his or her story to the other groups, who listen attentively without interruption. Only at the end does everyone express their thoughts, always with a constructive view to individual and collective growth.

3. Reflection and refinement: After the Storycircle, the various groups reflect on the feedback they received and, armed with this knowledge, meticulously refine their stories by agreeing on the text, audio, images and verification to be included.

4. Creation of the digital book: in this phase, they bring their plot into BookCreator, an app that allows them to create interactive digital books, inserting audio, video, avatars, images and interactive checks. This phase allows them to experiment with different multimedia elements and apps to further enhance the expressiveness of their narratives also through the use of AI.

5. Community screening: in this final phase, all groups show and share their stories to the other groups. Before presenting their story, each group leader explains the project idea, the goals they want to achieve and the apps they used to generate avatars, images, and verifications; the moment of the story screening becomes a

platform for constructive dialogue and for reflections and discussions inspired by the stories.

6. Sharing in Drive: all created works are placed in a common Drive where each design and each story can be used by everyone during their direct traineeship.

The observation showed that male and female students enjoyed creating and sharing their stories and felt motivated and empowered when listening to each other's stories. There was definitely a huge appreciation for the initiative. The analysis of the questionnaire, which was administered at the end of the training course but for which we do not yet have all the data, certainly shows the satisfaction of having created entertaining stories with which they can also identify and which can help the young pupils understand complex concepts. From the answers to some of the open-ended questions, it is clear that they were pleased to have made connections with colleagues they knew little about: "it was great to create these stories together, we were all enriched with new knowledge and new friendships" and again: "the effort in creating, telling and listening to stories served to negotiate different points and to see the perspectives of others not as a critical judgement but as personal growth", "these meetings were fundamental in making us understand how fun and easy it can be to teach mathematics and to make it accessible even to those who have difficulties".

The practice of DST has certainly provided a space to build collective knowledge and professional growth for these future teachers, who are aware that continuous and targeted training is necessary for an effective and conscious teaching/learning process. But a correct application of DST, in order to be truly effective, needs a school that always offers new opportunities to rework knowledge in order to encourage critical and divergent thinking; it is therefore urgent that methodological innovation and technological innovation must proceed in unison, not in disjointed fashion, seeking to co-evolve in order to truly be carriers of change and growth (Barca et al., 2024).

3. Metacognition-oriented assessment

Pedagogical and evaluative reflection in recent decades has highlighted the urgency of a transformation in the approach to school assessment, in a metacognitive and educational direction (Earle, 2013; Corsini, 2023). The training experience was focused on the design of teaching paths oriented towards authentic assessment and the promotion of awareness in learning processes. Through playful-narrative

methodologies, assessment was experimented with as a reflective tool, aimed at self-understanding and the unlearning of sterile assessment practices as an end in themselves. Digital storytelling, the use of illustrated books and the construction of rubrics fostered the integration of teaching, learning and assessment, restoring a processual and formative value to assessment.

3.1. Evaluation as a process

In the framework of the National Curriculum Directions (MIUR, 2012), assessment is understood as an integral part of educational planning. Corsini (2023) emphasises how the synergy between competence development goals and learning objectives is the basis for coherent and meaningful teaching. The goals constitute the objectives of the pathway, while the learning objectives serve as operational references, helping to structure the learning pathways (Trinchero, 2012).

Visalberghi (1955) already called for overcoming a technicalistic view of assessment, promoting a formative approach that values the use of a sense of measure and the act of assessing as an opportunity for learning. It is this perspective that has inspired the didactic experience presented here, aimed at exploring assessment as a metacognitive process in initial teacher training.

According to Article 2 of Ministerial Order 9/2025, learning assessment in primary schools is closely linked to the learning process and must document the development of personal identity, promoting self-assessment in relation to the acquisition of knowledge, skills and competences. This means that assessment cannot be a separate act, but rather a continuous process, consistent with teaching. It becomes necessary, therefore, to move from a linear didactics to a didactics of awareness, in which teaching, learning and assessment are intertwined in a coherent design aimed at the development of metacognitive competences. In this perspective, assessment does not simply mean measuring, but considering assessment as a teaching strategy, guiding and documenting it (Earle, 2013).

3.2. The workshop experience: storytelling and metacognitive evaluation

During the workshops, carried out in large and small groups of Primary Education students, the use of digital storytelling through illustrated books was proposed to address mathematical concepts such as number and measurement in an innovative way. This method favoured meaningful learning and the integration of cognitive,

affective and relational dimensions. A central element of the process was the participatory construction of evaluation rubrics, tools that made it possible to make shared quality criteria explicit, to make educational expectations transparent and to consciously orient the design work.

The rubric, discussed and negotiated together, did not only have an evaluative function, but a formative one: it stimulated critical thinking, reflection on one's own teaching actions, and the ability to put oneself into play.

Through the playful-narrative activity of the illustrated digital noticeboard, the students were able to design learning paths centred on awareness of their own learning processes. The construction of assessment rubrics, the use of self-assessment and observation grids, feedback and learning diaries (in short, the reasoned use of several assessment tools) facilitated metacognitive reflection and supported the development of assessment skills that were not improvised, but based on clear and shared criteria, consistent with the design aims. In this way student trainees were gradually able to experience evaluation in a metacognitive direction, putting into practice a sustainable idea of evaluation (Boud, 2000).

The workshops described thus proposed a reflexive and participatory approach to evaluation, which focuses on awareness, pedagogical intentionality and the dialogical dimension of the evaluation process.

3.3. Unlearning to evaluate

It is necessary, then, to unlearn some unproductive evaluation habits and to build a culture of evaluation consciously based on educational responsibility, capable of conceiving evaluation as a means and not as an end. Evaluation is not the end, but the tool to promote learning and growth. The evaluative power - warns Corsini (2023) - cannot be exercised as a unilateral act, but must be returned to the dynamic interaction between teacher and learner. The teacher, thus, does not 'give form', but 'receives form', to the extent that he allows himself to be transformed by the teaching-learning process he governs.

In particular, an assessment consistent with metacognitive goals must:

- a. be procedural, continuous and integrated to the course;
- b. Enhance self-reflection;
- c. Promote self- and peer-evaluation;
- d. stimulate the explication of reasoning and strategies;

e.be documented with consistent tools (e.g. rubrics, diaries, observation grids, interviews, self-assessment feedback).

This type of assessment, in line with the principles expressed so far, makes it possible to support sustained and conscious learning, capable of developing 'creative intelligence' (Gardner, 2006) and the ability to learn to learn.

Evaluation from a metacognitive perspective promotes reflective, participative and humane education. In an initial training context such as that of future teachers, it takes on crucial significance. As Nussbaum (2013) reminds us, it is only through the power to imagine just societies that we can build them, and education is the privileged and common space to exercise, together, this imagination.

Conclusions

Through this training intervention of an experiential/reflective nature, an awareness has certainly settled that any didactic intervention can therefore be designed to guide the evolution of mathematical meanings if at its basis one is aware of the most effective methodologies for proposing such meanings, is the ultimate goal of the educational/didactic intervention. The transformative impact of DST in unravelling and making even the most abstract mathematical concepts accessible to each and everyone has made the teaching/learning process a true dynamic platform for the co-construction of knowledge, but also and above all of critical, divergent and reflective thinking.

In the light of all this, the need for a fair and metacognitive evaluation of the teaching/learning process as well as a school, a privileged space for educating future citizens of the world, is obvious.

Author's contributions

This contribution is the fruit of the joint work of the authors; however, for the purposes of attribution of the individual parts, it is divided as follows: Abstract, introduction and conclusions are attributable to the three authors; Giuditta Ricciardiello §§ 1; Mariella Tripaldi §§ 2 Flora Colavito §§ 3.

References

- Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content Knowledge for Teaching: What Makes It Special? *Journal of Teacher Education*, 59, 389-407. <http://dx.doi.org/10.1177/0022487108324554>
- Barca, A., Romeo, F.P., & Tripaldi, M. (2024). *Sunset of empathy, tools and digital fairy tales in the post-modern and post-pandemic scenario*. Italian Journal of Health Education, Sports and Inclusive Didactics, 8(2), Edizioni Universitarie Romane
- Bartolini Bussi, M., Mariotti, M. A., (2008), *Semiotic mediation in the mathematics classroom: artifacts and signs after a Vygotskian perspective*. Handbook of International Research in Mathematics Education, New York and London
- Bilir-Seyhan G., Güler-Nalbantoğlu, F. (2023). *Representation of STEM Professions in Children's Picture Books*. EJER Congress 2023. Ani Publishing. 2023 pp. 163-178
- Boud, D. (2000). Sustainable assessment: Rethinking Assessment for the Learning society. *Studies in Continuing Education*, 22(2), 151-167
- Canevaro A., Ianes D. (2022). *Un'altra didattica è possibile. Esempi e pratiche di ordinaria didattica inclusiva*. Trento: Erickson
- Corsini, G. (2023). *La valutazione che educa. Liberare insegnamento e apprendimento dalla tirannia del voto*. Milano: FrancoAngeli
- Cottini L. (2019). *Universal design for learning e curricolo inclusivo*. Firenze: Giunti
- de Jager, A., Fogarty, A., Tewson, A., Lenette, C., & Boydell, K. (2017). Digital Storytelling in Research: A Systematic Review. *The Qualitative Report*, 22(10), 2548–2582
- Demartini, S., Sbaragli, S. (2024). 50 albi illustrati fra italiano e matematica: un particolare formato di storytelling. *In Didattica della matematica. Dalla ricerca alle pratiche d'aula*, Online www.rivistaddm.ch, 2024, 16, 181 - 241
- Even, R., Ball, D.L. (2009). The Professional Education and Development of Teachers of Mathematics: The 15th ICMI Study. *Springer Science+Business Media*. DOI 10.1007/978-0-387-09601-8
- Earle L.M. (2013). *Assessment as Learning: Using Classroom Assessment to Maximize Student Learning*. Thousand Oaks: Corwin Press

Fiorentino M.G., Montone, A., Ricciardiello, G. (2024), *Lo storytelling, la sinergia di artefatti e il gioco per costruire il senso di numero naturale*, Online www.rivistaddm.ch, 2024, 16, 164 – 179

Gardner, H. (2006). *Five Minds for the Future*. Boston: Harvard Business School Press. (Trad. it. Cinque chiavi per il futuro, Milano: Feltrinelli, 2007/2011)

Geake, J. (2008). Neuromythologies in education. *Educational Research*, 50(2), 123–133

Glaser, M., Garsoffky, B. & Schwan, S. (2009). Narrative-based learning: Possible benefits and problems. *Communications*, 34(4), 429-447

Karakoyun, F., & Kuzu, A. (2016). The Investigation of Preservice Teachers' and Primary School Students' Views about Online Digital Storytelling. *European Journal of Contemporary Education*, 15(1), 51–64

McLellan, H. (2007). Digital storytelling in higher education. *Journal of computing in Higher Education*, 19, 65-79

Morin E. Gembillo, G., & Anselmo, A. (2017). *La sfida della complessità*. Firenze: Le Lettere

MIUR (2012). *Indicazioni nazionali per il curricolo della scuola dell'infanzia e del primo ciclo d'istruzione*. Roma: Ministero dell'Istruzione

Muller, D. A., Eklund, J., & Sharma, M. D. (2006). The future of multimedia learning: *Essential issues for research*

Nussbaum, M. C. (2013). *Political Emotions: Why Love Matters for Justice*. Cambridge: Belknap Press of Harvard University Press. (Trad. it. *Emozioni politiche. Perché l'amore conta per la giustizia*, Bologna: Il Mulino, 2013)

Persi R., Montanari M. (2021). *La narrazione nel processo formativo*. Roma: Aracne

Piaget, J. (1954). *The construction of reality in the child*. Ballantine

Prusak, L., Groh, K., Denning, S., & Brown, J. S. (2012). *Storytelling in organizations*. Routledge

Rabardel, P. (1995). *Les hommes et les technologies; Approche cognitive des instruments contemporains*. Paris: Armand Colin

Ramalia, T. (2023). Digital Storytelling in Higher Education: Highlighting the Making Process. *Journal on Education*, 6(1), 7307-7319

- Robin, B. R. (2016). The power of digital storytelling to support teaching and learning. *Digital Education Review*, 30, 17–29
- Roig, A., Pires de Sá, F., & Cornelio, G. S. (2018). Future Story Chasers: An experience with co-creation of fiction in the classroom through a collaborative storytelling game. *Catalan Journal of Communication & Cultural Studies*, 10(2), 279–289
- Sierpinska, A. (2004). Research in mathematics education through a keyhole: Task problematization. *For the Learning of Mathematics*, 24, 2, 7–15
- Schmoelz, A. (2018). Enabling co-creativity through digital storytelling in education. *Thinking Skills and Creativity*, 28, 1–13
- Shulman, L. S. (1986). Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.2307/1175860>
- Trinchero, R. (2012). *Costruire, valutare, certificare competenze*. Milano: Rizzoli
- Vertecchi, B. (1976). *La valutazione formativa*. Torino: Loescher
- Visalberghi, A. (1955). *Misurazione e valutazione nel processo educativo*. Ivrea: Edizioni di Comunità
- Zazkis, R., & Liljedahl, P. (2009). *Teaching mathematics as storytelling*. In Teaching Mathematics as Storytelling. Brill
- Zazkis, R. Liljedahl, P. (2024). Insegnare matematica come narrazione. In *Didattica della matematica. Dalla ricerca alle pratiche d'aula*, Online www.rivistaddm.ch, (16), 61 – 92