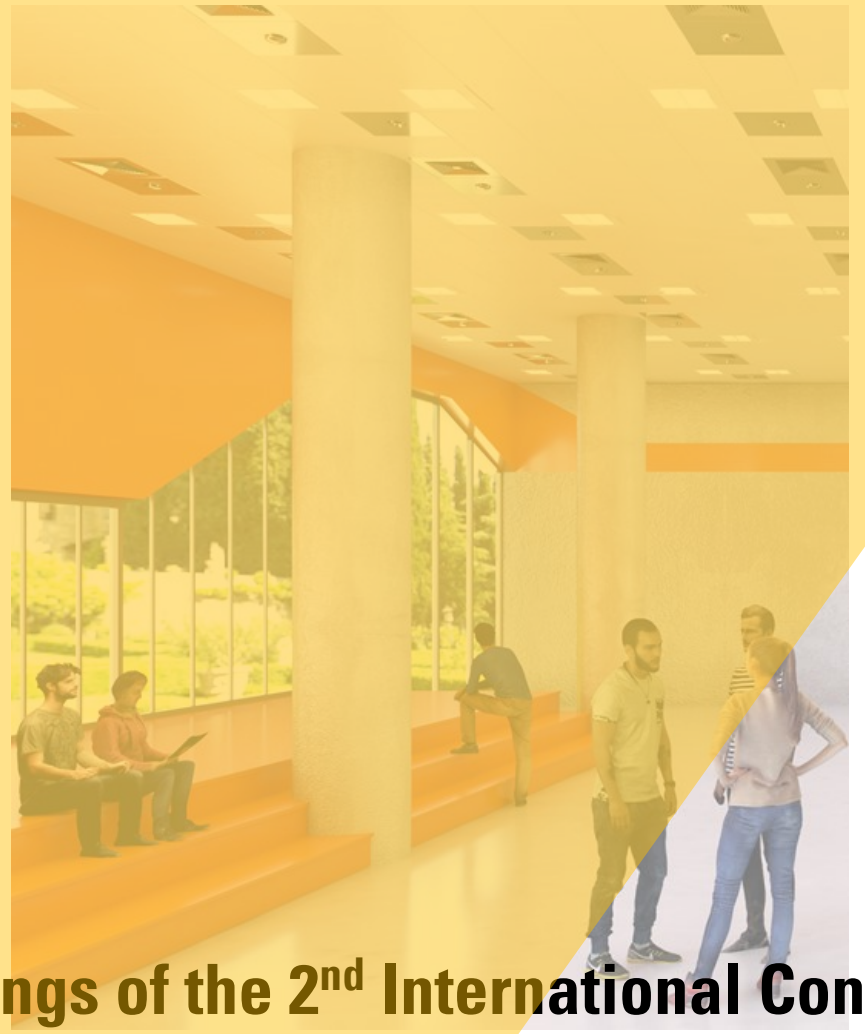

# Proceedings of the 2nd International Conference of the Journal Scuola Democratica

## REINVENTING EDUCATION

## VOLUME II

# Learning with New Technologies, Equality and Inclusion

ASSOCIAZIONE "PER SCUOLA DEMOCRATICA"

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# Digital Education Design. Evaluation Approaches, Tools and Techniques

# Teaching through Motion Design and Transmedia Storytelling. An Integrated Approach to a Critical Evaluation

**Valentina Faloni, Vincenzo Maselli** and **Giulia Panadis**
Sapienza University of Rome, valentina.faloni@uniroma1.it
Sapienza University of Rome, vincenzo.maselli@uniroma1.it
'Gabriele D'Annunzio' University of Chieti-Pescara, giulia.panadisi@unich.it

**ABSTRACT**: *The COVID-19 pandemic has contributed substantially to defining new teaching methods, to accelerating the learning and development of digital tools, and has intensified the use of videos as dynamic and captivating media closer to the younger students. The transition from direct to indirect learning methods and to deferred experience through the use of recorded video-lectures and tutorials was already tested by telematic universities and online courses and forces students into a passive role, with very little space for interaction, collaboration and relationship (even emotional). How can the pedagogical use of animation and motion design be improved in this context? This paper aims to provide a new method for delivering distance learning through animation and transmedia storytelling, trying to implement interactivity and participation. The margins for improvement are numerous, and we discuss the possibility of producing edutainment artefacts filled with interactive activities that ask young children to solve prestructured tasks and to experience multiple predesigned scenarios. «Choose-your-own-adventure narratives» are gaining ground in recent years and associates a playful component in which the viewer participates in the character's choices. Using transmedia storytelling for developing reflective learning can prove to be an interesting trial as it emphasizes the dynamism of the medium in building new learning experiences without removing the focus from the storytelling. A critical approach to the most effective tools to validate the proposed method, process and product is the evaluation objective of the paper. The integrated use of the developed evaluation tools, ultimately, has to test students' learning status and the communication effectiveness of the used method and products.*

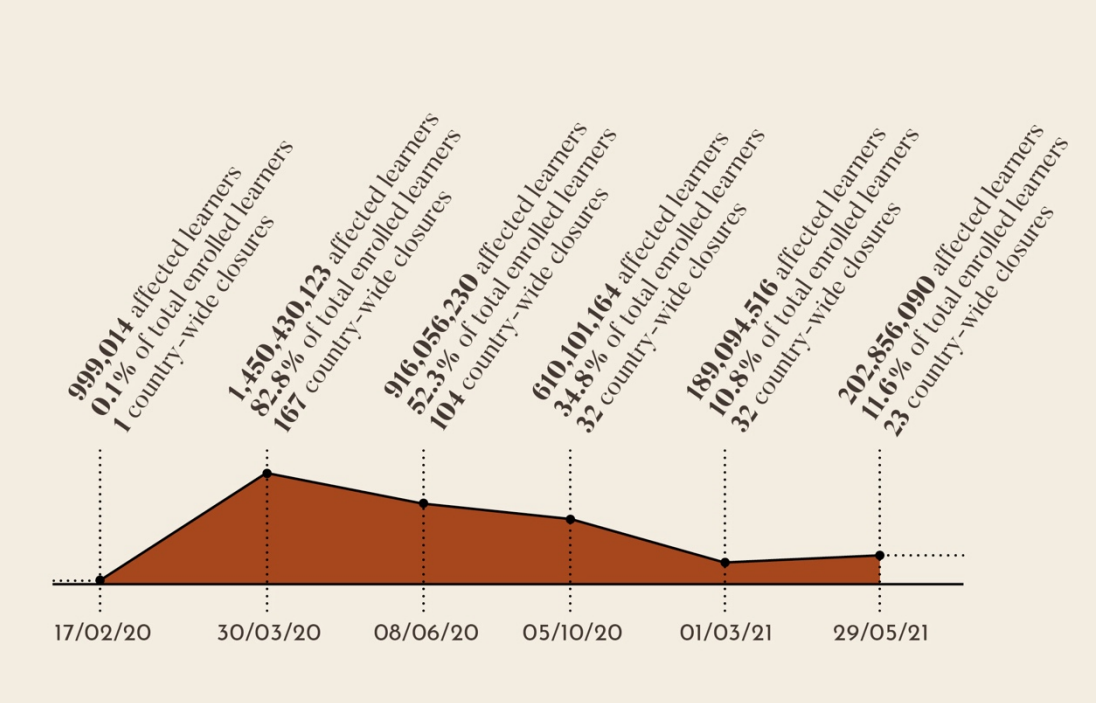
**KEYWORDS**: *Motion design, Transmedia storytelling, Agency, Couterfactualism, Evaluation tools.*

This paper shows the result of a common discussion and elaboration work, but the writing of paragraphs can be attributed to: Giulia Panadisi (Introduction, 1), Vincenzo Maselli (2, 3, Conclusions), and Valentina Faloni (4, 5).

## Introduction

In a year and a half of the COVID-19 pandemic, almost all students in the world have been affected by the partial or total closure of schools for a long period of time (UNESCO, 2020) (Fig. 1): this has led online teaching to acquire a role of primary importance in education at all levels. The main means through which the transmission of notions takes place is video: live or recorded lessons, static or animated videos are the main product that students experience in the distance learning path.

**FIG. 1.** *Global monitoring of school closures caused by COVID-19 since February 2020*




Source: UNESCO – https://en.unesco.org/COVID-19/educationresponse

In one year, the implementation of infrastructures for online teaching has undergone an important acceleration, to the canonical videoconferencing systems – that allow the reproduction of the lesson live or in streaming (if previously recorded) – social platforms and new tools have been added to make the distance learning process faster and more direct in the virtual classroom. On the one hand the possibility of giving open lessons to a potentially unlimited audience and of having access even remotely to the educational contents by students represent the strengths of distance learning, on the other hand the lack of direct interaction and the lower emotional involvement constitute its weak points and are among the most discussed topics on the subject. Teachers who have been teaching face-to-face for years try to replicate dynamics and online dialogues (Mehall, 2020) through the interaction tools made available by digital and virtual tools. Teachers are pushed to increase the quality of their online courses, but quite often are unaware of strategies to encourage students

to interact and be more involved (Paquette, 2016). Improving the possibility of direct interaction between teachers and students is a fundamental step to make distance learning more human, and to give a more engaging and effective experience. It is necessary to design a hybrid learning strategy that involves the audiovisual product and the narrative component.

Starting from these premises, the early hypothesis is that motion design together with a transmedia narrative and interactive tools could build a valid teaching strategy and that it can assume a role of support for learning and interaction able to fill, at least in part, issues relating to social distancing in the context of school education.

## 1. Animation and education

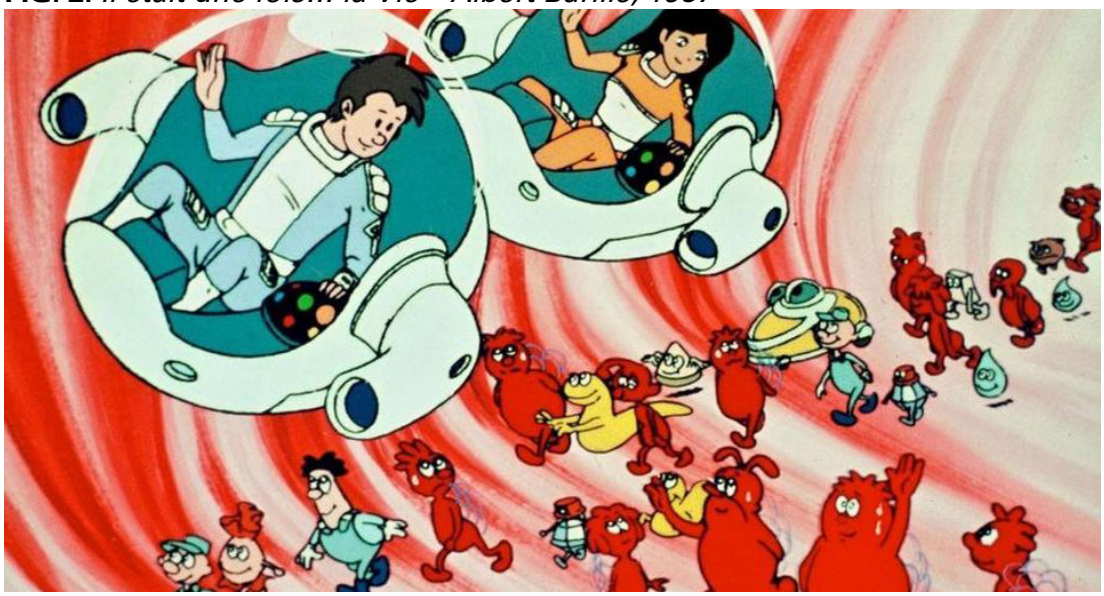
The use of animated language for educational purposes is far from recent; as early as the second decade of the 20th century, the first experiments in pedagogical animation began and there are interesting cases of animation used as a tool to explain, clarify and visualize complex topics (Honess Roe, 2013). Among the first attempts stand out *Tommy Tucker's Tooth* by Disney (1922) and *The Einstein's Theory of Relativity* by the Fleischer Brother's (1923). After the Second World War, some scientific animated documentaries were entrusted to Frank Capra by Disney, including *Hemo the Magnificent* (1957) and *Our Mr. Sun* (1956). In those years, animation was already a more complex tool than in previous decades with new techniques, and above all the diffusion of television in private residences of the majority of the population increased its presence. From the 1980s to the most recent years, the examples are countless and vary from successful series designed for children on television, such as the well-known *Il était une fois... la Vie* by Albert Barillé (1987) (Fig. 2), up to motion design videos for social platform such as those of the German animation studio Kurzsgesagt (Fig. 3).

Animated language for a long time has contributed to teaching complex topics and has stimulated the involvement and interest of students. Motion design and animation reveal to be an attractive language capable of capturing the interest of different age groups, easily customizable and with the possibility of adapting to different platforms. The several animation techniques make them a modern and dynamic language in continuous growth, and so capable of attracting different targets.

The multiplicity of platforms and devices allows both a significant diffusion and technological progress of animated products in fields that require innovation. The user indeed, is increasingly involved in an «active» participation in the animated video through the interactive component. In educational contexts, it allows the student to participate in a dynamic and productive way, effectively building his learning path. In

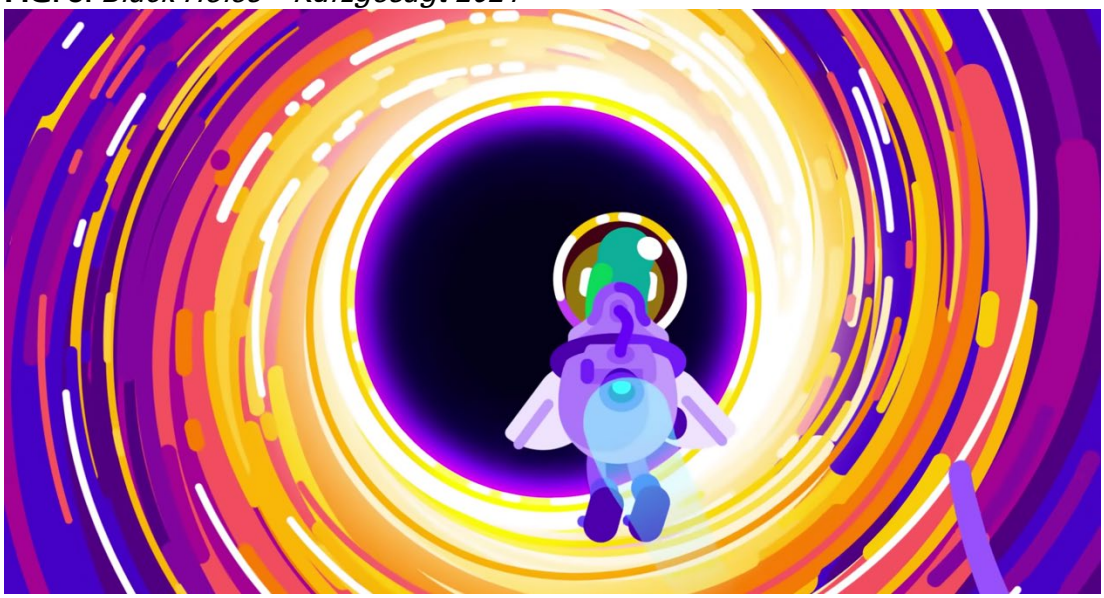
the following sections we will describe existing samples of interactive audiovisual products and suggest how to apply these production criteria to the field of education.

**FIG. 2.** *Il était une fois... la Vie – Albert Barillé, 1987*



Source: LaStampa.it

**FIG. 3.** *Black Holes – Kurzgesagt 2021*



Source: https://www.youtube.com/

## 2. Interactive video e-learning: from augmented reality to agency

Dongsong Zhang in 2005 conducted an experiment to measure the effectiveness of interactive video e-learning, and demonstrated that students who experience fully an interactive learning environment get better results and enjoy the learning path more than conventional class conducted in a non-interactive environment (Dongsong, 2005). Another

research conducted by Jawid Nazir, Aftab Haider Rizvi, Ramachandra Pujeri in 2012 investigated skills development on animation interactive learning in higher education environments, and the results showed that those formats helped in better understanding (Nazir et al., 2012).

In animation, interactivity has been explored with different meanings. Animation interactive learning methods have been tested in the last years working with AR technology and smart devices. The impact of augmented reality has pushed experiments of fully immersive, headset-based VR experiences, that are now a powerful creative production tool for animation studios (a few examples: Pearl, 2016; Lily, Snot, 2017; Doctor Who, 2019; Lifetime Achievement, 2020 Paper Birds, 2020) and also a method for experiencing Interactive Learning. In 2015, for instance, the Dutch Studio *Analoog* took up a study to find out whether animation could have a positive effect on learning by using AR technology. A team of designers and educators tested a beta-version app that allowed students to scan a math problem with a tablet or smartphone and then, through augmented reality, view an animation that explained the problem.

AR experiences do not necessarily require agency. Agency is always interactive and – according to Janet Murray (1997) – allows «to take meaningful action and see the results of our decisions and choices». Consequently, agency is the element that elevates a better, and more involving narrative from a basic one. Through agency – according to Mark Meadows (2003) – the author allows flexibility in their story, enough that viewers can feel agents of change, even if every single change was orchestrated from the beginning.

Making decisions and seeing the results, even if in structures with limited branches, ensure the viewers stay invested in what they are watching, and can give the feeling of making a difference. The viewers' choices can lead to many unexpected scenarios, and although they might not always be pleasant ones, they have invested their time, a valuable resource they could have spent on something more linear that does not necessarily give them the same amount of control than an interactive film can give.

Most important, agency is a tool for education. Educational live-action videos and animation, as mentioned, have been used in schools, at home and at public events for decades. Regardless the style used and the data collected, the common format stages a pre-recorded footage with a voiceover narrating. These videos, therefore, lack an interactive element. As reported by In one study conducted in 2017, a study conducted in a class reveals a strong interest in using mobile and interactive devices in their learning process: 96 per cent of students described these tools with the keywords motivating, enriching and pleasant (Benkada, Moccozet, 2017, 5).

### 3. Agency in audiovisual products

Agency has been experimented in cinema and video production in the last 30 years.

In 1992 a short film titled *I'm Your Man*, directed by Bob Bejan, was released and showcased a new interactive cinema technology: a special controller embedded in each seat that allowed the audience to vote for the next action that should happen in the film. During its 20-minute running time, the film had six different points at which the audience could cast their votes (Fig. 4). The film was also released on DVD in 1998, and viewers could choose their actions with a TV remote.

Interactive videos have come a long way since this first joystick-controlled film, embracing a Video Game Aesthetic (Deen, 2011) made up of buttons, overlaying questions and specific layouts (Leppänen, 2020). Today viewers do not have to leave the comfort of their own home to see an interactive film, and the internet has made it possible for streaming platforms to thrive and develop new ways of watching content.

*Black Mirror: Bandersnatch* is an interactive *choose-your-own-adventure* episode of the Black Mirror series, created by Charlie Brooker and directed by David Slade. It was released in December 2018 on the American streaming platform Netflix. The film consists of short scenes that are meant to fit seamlessly together despite having a branching storyline. When the viewer is in the choice menu, the film will continue to play in the background instead of pausing until a path is chosen (Fig. 5). Another recent example of a completely interactive series is *You vs Wild*, produced by Netflix in 2019. The storyline revolves around making key decisions to help the British adventurer, writer, and television presenter Bear Grylls navigate in harsh, scary environments to survive and complete missions. Grylls speaks directly to the camera, asking the viewer to select between options like scaling a cliff or scrambling along the coastline.

An interesting recent interactive experiment is The Eko app, the world's first interactive storytelling platform that lets the viewer control the story, founded as Interlude in 2010, and rebranded in 2016. Eko's multimedia contents turn viewers into participants, providing them an unprecedented ability to seamlessly affect, control and influence the storylines as they unfold, by deciding which character to follow in any scene, and getting their perspective on the story, by splitting Key moments into different options, making audience's decisions determine the outcome, and changing every time the path of the story and so discovering infinite possibilities. (A few titles are: *Wizard School Dropout, Epic Night, The Coop, Timeline, Clothes Call, BuzzFeed, Cook Together, Make or Break*).

Netflix has embraced this new frontier of interactivity and extended the choose-your-own-adventure narratives to animated products. In 2020 the platform released a «choose-your-own-adventure» animation with the episode *Carmen Sandiego: To Steal or Not to Steal* (Fig. 6), an interactive

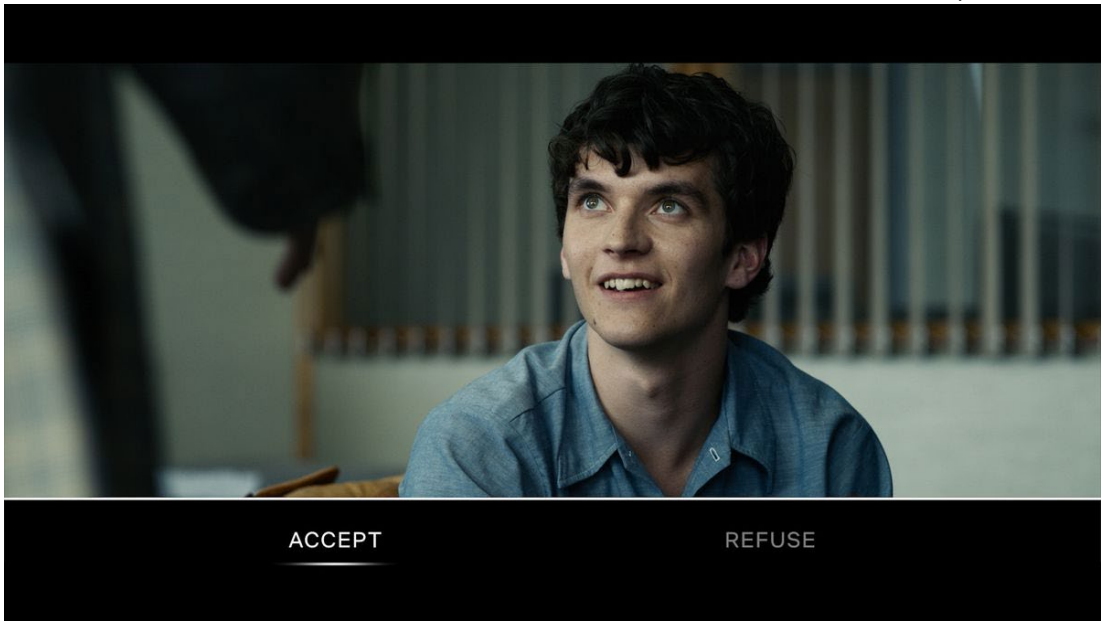
project less sophisticated than the previous *Black Mirror: Bandersnatch* and aimed at a younger audience. According to Petrana Radulovic (2020), indeed, the episode has a set, determined path, and if the viewer choses a different branch, the story goes wrong. While the game's individual moments make full use of the 2019 show's animation and its usual creative team, the gameplay mechanics and the audience's choices don't have a big impact on the story. There's always a «wrong» option, and picking it will lead to failure. Then, after a few steps forward in the way of the wrong ramification, the game suggests heading back and selecting the «right» answer that it wanted all along. At other times, a wrong choice immediately launches the story's endgame.

Interactive narratives, also known as «choose your own adventure» stories, allow the viewers to decide the direction of the story's plot. These narratives are a declination of transmedia storytelling, since they use different media (game, video and written text) and help to refine and integrate the user experience. Using transmedia storytelling for developing reflective learning (Dewey, 2019) can prove to be an interesting trial as it emphasizes the dynamism of the medium in building new learning experiences without removing the focus from the storytelling. Interactive narratives, therefore, make sure to have a more effective entertainment-education toolbox, since individuals are more engaged within the narrative (Moyer-Guse, Nabi, 2010).

**FIG. 4.** *I'm Your Man – Bob Bejan, 1992*

Source: *I'm your man*, DVD release 1998

**FIG. 5.** *Black Mirror: Bandersnatch – Charlie Brooker and David Slade, 2018*




Source: *https://www.netflix.com/*

**FIG. 6.** *Carmen Sandiego: To Steal or Not to Steal – Netflix, 2020*

Source: *https://www.netflix.com/*

## 4. «Choose-your-own-adventure narratives» and *counterfactualism*

In the studies on future thinking and on the cognitive effects of narration, *Counterfactuality* moves between reality and fiction, original and copy, true and simulated, representing a key element to understand the world that surrounds us, since it designates an «unreal» world somehow close to everyday life.

«Counterfactual thought» identifies human being's ability to imagine, formulate hypotheses, configure predictive schemes. Only by

considering a possible world we can reflect on reality and intervene to actively transform it (Gopnik, 2010, 36), and by understanding the causes of something we can imagine all the causes that *could have* become true and feasible. Imagination and causation, in fact, feed in a biunivocal way. For these reasons, the *narrative choice,* offered by a «choose-your-own-adventure narrative», gives the possibility of co-participating in the construction of a new knowledge and, at the same time, amplifying that learning process which, thanks to the use of the *story*, allows the learner to acquire new knowledge and to metabolize it. The function of counterfactual thought, in fact, is to reconstruct the past in the present by creating alternative representations to what has already happened, and to hypothetically simulate future events using the bank-data stored by our brain regarding what we have experienced (Calabrese, 2019, 174).

In the «narrative database» of our brain we keep the pre-existing images and structures related to the experience gained in the surrounding world, and the communications we have enjoyed and thanks to which we have been able to orient ourselves in the real world. Storytelling allows to resort to emotionality and some research (Gardner, 2002; Labar, Le Doux, 1999; Goleman, 1996) demonstrated the role played by emotions in making learning more effective. The narrative involves active involvement of the learner in the process of DIY shaping itself as an innovative device for training and for the recognition of their own learning history (Argyris, Schön, 1998).

John Dewey (1967, 2019) already insisted on the value of the narrative mode of thought as an opportunity to reflect on experience, but it was Jerome Bruner who demonstrated that the meaning of personal reality is achieved by the conceptualization of our own narrative, and also that stories are the way to organize, interpret and give meaning to experiences, ensuring a sense of continuity (Bruner, 1988, 1992). By making students participants and agents of their own knowledge through the choices of a «choose-your-own-adventure narratives», it is possible to redefine their role of actors in the learning process. The narrative, understood in this way, becomes an expression of an adventure, a reconfiguration of the self, a redesign of subjectivity, a reorganization of an existential dimension; a *task that* sustains, understandings, representations, but also desires and hopes (Laeneve, Gemma, 2013, 57).

This approach can, therefore, represent a formative path aimed at fostering a greater awareness based on the human, cultural, social components and so on, acquired during a learning experience, because the formative process is always and, in any case, peculiarly narrative (Batini, 2009). The training process, intrinsically relational, finds, in the mentioned relationality*, the* negotiation of the self with the self-others, as to say: educate narrating (Demetrio, 2012), give a narrative structure to the educational path, conceive of education not only as a time and place of explanations, of the transmission of knowledge, but also as reciprocal listening between narrative subjects whose identity is first and foremost a narrative identity (Laneve, Gemma, 2013, 59).

## 5. Evaluation tools for a narrative approach

The characteristics of narration can be summarized in three fundamental processes: the subjectivation; the assumption; the perspective plurality. Storytelling represents an act with a dual function: on the one hand it is a direct way to the interiority (narrative in reflective function), on the other it is an act directed to the context in which you are immersed (narrative in communicative, explicit, documentary function) (Laneve, Gemma, 2013, 38). The structure of the narration is well suited both to read phenomena and processes (the narration as a research tool) and to produce intentional actions and changes (the narration as a didactic strategy) (Cassani, Fontana, 2000). The basic idea in the use of storytelling methodology is the development of reflective learning, consisting of intellectual and affective activities. Narrative structures are just as important as the medium through which they are presented and help to interpret the experiences and complexity of social life.

For these reasons, evaluation tools as «evaluation reports», considered as a «progression of competence profiles useful to provide points of reference for the evaluation of learning» (Castoldi, 2016, 181), and as a device to conceptualize the levels of mastery of the expected skills and provide a useful framework for tools and subsequent evaluations (Castoldi, 2016), could be particularly suitable. «Professional diary» (by teachers) could be added to validate the application of a narrative method, already inherent in the use of transmedia storytelling, and to evaluate the experience and, therefore, the results of the process of knowledge and training, individual and collective, identity-related and educational.

A proposal could start by re-designing the «evaluation reports» proposed by Petrucco and De Rossi (2014) formulated to evaluate digital storytelling products. These reports, when applied for an assessment of process competence, are able to meet quality criteria such as validity, articulation and promotionality (Castoldi, 2016, 188). As anticipated, the use of «evaluation reports» – which investigate dimensions such as: monitoring; socialization; reflection; change; dissemination; and interaction – need to add the «professional diary» (Lavene, Gemma, 2013), in order to better monitoring the process. This occurs because the evaluation of the entire learning path conveyed by a transmedia storytelling that employs the «choose-your-own-adventure» narratives is aimed not just at measuring skills, rather than at reproducing knowledge, to its «original and functional reworking to a given context of action» (Castoldi, 2016, 188).

It is, therefore, an *authentic task* that aims to «encourage students to use their knowledge, skills, cognitive and emotional dispositions to develop answers to significant tasks and engaged in real contexts. The keywords of the evaluation process [...] become «inventing», «recreating», «applying», «reworking». The elaboration of authentic tasks indicates a mode of verification that aims not to limit the attention to the

knowledge or abilities reached, but to explore the mastery of the subject within a given domain of competence (Castoldi, 2006, 189). The concept of competence therefore focuses on the elaboration of complex socio-emotional cognitive strategies, especially when they are expressed in groups, which involve the active and personal use of their knowledge in creative activities. For this reason, an evaluation approach aimed at enhancing performance based on an «authentic, dynamic and active knowledge, connected to reality» (Comoglio, 2004, 38) aimed at developing a theoretical knowledge-practice consistent with the training path and with the objectives of a project that employs the «choose-your-own-adventure narratives», provides the elaboration of a specific heading declined on the elements present in the «general reports» in relation to the requested performance, outlining itself as the most appropriate tool for an assessment that considers each of the aspects presented. «Evaluation reports» are therefore a useful reference track to describe the characteristics of the student learning experience and a matrix of dimensions, criteria and indicators (Castoldi, 2016, 198) from which to start in order to acquire competences and in order to document the carried out distance.

## Conclusions. Pedagogical objectives and design guidelines

Collected theoretical coordinates has brought to light that transmediality and interactivity should be effectively implemented to convey didactic contents, by allowing an active and shared participation and by structuring a narrative during the process. An interactive *choose-your-own-adventure* structure, therefore, allows to reach the following pedagogical objectives:

- transportation, as being able to participate in the narrative makes readers more immersed into the story, and «people who are transported into a story are likely to change their real-world beliefs in response to information, claims, or events in a story» (Jenkins, 2014, 11).
- Identification, as the character makes decisions taken by the viewer. Identification with characters allows to «merging with the character and sharing the character's knowledge about the narrated events, adopting the character's goals…and sharing the character's emotions» (Tal-Or, Cohen, 2010, 404). During identification, therefore, viewers adopt the character's point of view and knowledge.
- Responsibility, as having a hand in the actions of the story makes participants feel a sense of responsibility for the events of the narrative. Viewers choose the character's actions; thus they are likely to feel the consequences and outcomes in the story. These kind of agency in an interactive narrative could lead to more awareness about their choices (Jenkins, 2014, 15).

- Knowledge update. Experimenting with the resolution of a problem by operating on what is known about it, has a function of understanding and verifying knowledge. The choice made involves reflective thinking, conveyed by the story.

A new method for delivering distance learning through transmedia storytelling, trying to implement interactivity and participation, can be based on a series of steps and design guidelines. An animated didactic product, therefore, designed with an interactive *choose-your-own-adventure* structure, requires to:

- Write a narrative that – metaphorically or not – tells specific didactic contents;
- Build a learning process with agency that makes users' choices decisive for the continuation of the narrative;
- Structure a path with ramifications to be chosen freely without any imposition of contents;
- Structure a narrative with different «endings», each one demonstrates the correct application – therefore understanding – of a theoretical apparatus conveyed through the narrative itself. The implied screenwriting work involves the running of numerous storylines, each one is able to provide information to be learned in virtualized environments.
- Plan a shared experience. The narrative must be «crossed» collectively, following the gaming criteria of MMORPG communities and guilds made up of specific group of users (i.e. class group) who, starting from the same theoretical premises, must work together to choose which path will allow them to reach the «best» ending.

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