2022

Held at the University of Porto, Portugal
July 07–10, 2022

ecade

The European Conference on Arts, Design & Education

OFFICIAL CONFERENCE PROCEEDINGS

"To Open Minds, To Educate Intelligence, To Inform Decisions"

The International Academic Forum provides new perspectives to the thought-leaders and decision-makers of today and tomorrow by offering constructive environments for dialogue and interchange at the intersections of nation, culture, and discipline. Headquartered in Nagoya, Japan, and registered as a Non-Profit Organization (一般社団法人) , IAFOR is an independent think tank committed to the deeper understanding of contemporary geo-political transformation, particularly in the Asia Pacific Region.

INTERNATIONAL

INTERCULTURAL

INTERDISCIPLINARY

iafor

The European Conference on Arts, Design & Education 2022

Official Conference Proceedings

ISSN: 2758-0989

Table of Contents

Material Design and Audio-Visual Narratives for Pedagogy: Theoretical Premises and Evaluation Tools for Experimenting Stop-Motion Animation as Teaching Method

Vincenzo Maselli, Sapienza University of Rome, Italy

The European Conference on Arts, Design & Education 2022
Official Conference Proceedings

Abstract

Since the early 1900s the pedagogical research has matured a materialist perspective, recognizing the essential contribution of creative practice and material experience within learning paths. Starting from John Dewey's philosophy of experience (1938), passing through Maria Montessori and Bruno Munari's experimental teaching methods, Riccardo Massa's "educational materiality", to the most recent socio-material approaches, pedagogy has embraced the relationship between human beings, material art and experience design. These studies have explored and theorized how learning and knowledge are rooted in actions that encourage creativity, cooperation and reflective thinking. By starting from this theoretical framework and taking up the educational objectives formulated by the OECD for 2030, the proposed paper illustrates the methodological and theoretical coordinates of the research project "CCODE - Design, material experiences and stop-motion animation as didactic tools for developing creative thinking and cooperative learning", that suggests an experimental learning method based on storytelling and stop-motion animation tools, thus amplifying the educational value of this art form. The understanding and analysis of a narrative text, its transposition into a screenplay, the material manipulation and the stop-motion animation process are the phases described to structure an unprecedented and interdisciplinary method of acquiring theories, techniques and develop socio-emotional-cognitive skills. The paper therefore aims at disseminating the project's premises and ethical implications and describes both the experimental teaching module based on learning by doing (Bruner 1966, Dale 1969) and the evaluation tools carried out to validate the approach, the method and the educational objectives achieved.

Keywords: Design, Material Experience, Stop-Motion Animation, Teaching Method, Evaluation Tools

iafor

The International Academic Forum
www.iafor.org

Introduction

CCODE is a research project that aims at designing and testing a new and experimental educational method focused on stimulating cognitive, practical and social skills, by hybridizing different disciplines – pedagogy, narrative sciences, material design and animation design –, and structuring a workshop experience with 5th grade elementary school students. The designed learning approach aims at making students face some social themes of contemporaneity and their emotional and psychological effects by conducting an active and participatory experience: they are expected to analyze a narrative text, to translate it in a screenplay, to manipulate material and produce an artifact in stop-motion animation.

Experiential education, material manipulation and the design principles of the puppet making process and audiovisual production – specifically the stop-motion animation technique – are the tools suggested to structure the experimental learning path. The specific objectives of the new method are defined by integrating philosophies and pedagogical approaches based on the enhancement of sensuous and material dimensions, and the educational and didactic objectives formulated by the OECD (Organization for Economic Co-operation and Development) in terms of practical, theoretical and social skills. In the following sections the project's theoretical frameworks, its objectives, the addressed methodological approaches and hypothesis of structure will be described.

From "sensory education" to "educational materiality"

The materialist epistemological perspective in pedagogical research developed in the 20th century has recognized the necessary contribution of the material and experiential components in learning processes (Barone 1997). Among the main references in this field are John Dewey, Maria Montessori, Bruno Munari, David Kolb and the Italian pedagogist Riccardo Massa. In the 20th century, pedagogy has examined and linked the concepts of experience, collaboration, and the material dimension and the design process in the educational field, discussing the possibility of making the experience of material manipulation a learning tool to discuss topics about the contemporary (Dewey 2008, 2014; Massa 1975; Barone 1997; Fenwick et al. 2011, 2012).

John Dewey in the late 800s pointed out for the first time that the learning process in school should include a series of social, emotional, and practical events. It must occur in a social context in which students cooperate with their pairs and have a common learning objective. Dewey's view of learning process took into huge consideration the social, interactive, motivational, and cognitive aspects of the process of schooling (Dewey 2008). Dewey inaugurated a path of studies according to which students experience the relations between the thinking and the empirical world, between organism and environment, perception and objects, nature and culture, facts and values, instruments and objectives, individual and society, play and work, to build new spaces of freedom (Dewey 2008, 2014; Sharan and Sharan 1992).

Sensory education and the pedagogy of doing are other pedagogical approaches that place the value of action, movement and material dimension at the center of the learning experience (Valitutti 1964). Maria Montessori in the early 1900 reconfigured the role of the child and the importance of sensory stimulation in the learning process. The Montessori method, as it has been defined, depicts a child who, acting autonomously and independently in the

environment, undergoes sensory experiences, which stimulate, without further mediation, the development of his intelligence because "senses, by exploring the environment, open the way to knowledge" (Montessori 1999, p. 181). In the Montessori educational learning environment, materials are very important for activating knowledge. Materials, on the other hand, intrigue and attract attention, so that children get more focused.

In the 50s, the designer Bruno Munari continued experimentation on visual languages applied to pedagogy in order to develop creativity in children. The Munari Method aimed at stimulating children creativity through practical-based activities and he called this learning approach "gesture intelligence" (Munari 1958, 1992). In the "gesture intelligence" approach the hand is a tool endowed with an unlimited and incipient predisposition to learn and perform multiple activities. Tactile abilities, according to Munari, allow man to build an evolving relationship and to explore the external world and of its information (Munari, 1958).

In the 80s David Kolb addressed interaction and complementarity between theory and practice as the main means of knowledge (Kolb, 1984). He theorized the efficacy of the experiential learning model, and today this approach is widely recognized and validated to teach practical disciplines and make acquire technical skills. He described four stages of the experiential learning model that work in a cyclic way: concrete experience; reflective observation; abstract conceptualization; testing in new situations.

The Italian pedagogist and philosopher of education Riccardo Massa, in the 80s coined the expression "educational materiality" (Massa 1975, 1986), that defines a particular way of conceiving educational practices and of interpreting the learning process in a materialist sense. Educational materiality is established on two different levels. First, materiality is a key concept for decoding the educational reality and delineating a pedagogical object to be studied theoretically and empirically. On the other hand, materiality refers to educational methods based on concreteness, experience and relationships lived bodily and emotionally.

In recent years the so-called socio-material approaches have assumed a certain importance (Fenwick et al., 2011). These approaches have brought the material to the center of the debate and have shifted attention to the multiple relations between human and non-human (objects, tools, technologies, spaces, furnishings, natural elements) that occur within the educational processes. These studies aim at exploring how learning and knowledge are concretely rooted in action, and suggest exploring the materiality of educational processes in contexts of participation and collaboration.

Stop-motion and "tactile pedagogy"

Stop motion animation technique has its roots in late '800AD when the illusionist George Méliès randomly discovered the camera-trick according to which by stopping and restarting the camera during the shooting and in the meanwhile changing the position of the object in front of it, the object looks to move by itself (Harryhausen and Dalton 2008). As illustrated by Vincenzo Maselli and Eleni Mouri:

> "This movement is an illusion since it happens between the frames, and what the spectator really sees is what occurs [...] when everything is still and nothing happens. Stop-Motion embraces photography, computer graphics, performing arts, sculpture, knowledge of anatomy of moving bodies and video editing. To make a stop-motion

video we need a camera and a material object to be photographed, following a logic of movement, direction and transformation." (2020, p. 648).

Stop motion is remarkably versatile in several ways as it can be used for many subjects, with every sort of materials and objects (plasticine, silicone, toys, legos, household objects), it can use figurative or abstract codes of representations and, as any other form of animated artefact, it can narrate in either linear or nonlinear ways. Stop-motion has been used for pedagogic purposes since the material qualities of the medium makes the production process easier to understand and to handle thanks to the direct manipulation of objects, puppets or flat figures. Stop-motion "tactile pedagogy" allows to learn tactilely how animation principles work by applying them to real objects, to interact with materials and manipulate them by hand, improving craft skills, and to work in group. Since stop motion requires many skills and inclinations, from artistic and craftsmanship talent to organizational skills, collaboration and teamwork are essential. As a material and tactile based learning method, Stop-motion "tactile pedagogy" has already been explored and used in different educational experiment based on the enhancing of the tactile experience and collaborative dimension of the technique.

By describing a stop-motion workshop experience conducted in 2014 Stephanie Hatten defines this animation technique capable of capturing students' imagination, investment and memory. By engaging elementary school students with this creative activity for over a decade she has tested that stop-motion animation allows to interact and learn how to use digital programs, how to work with the camera, how to work with abstracts codes of representation, how to select, manipulate or create the materials, and to work in groups (Hatten 2014). The English teacher Dan Grant in 2009 published an article describing his didactic approach with 5th grade elementary students to work with storytelling and animation by simulating a stop motion production work team in the classroom (Grant 2019). The principal investigator of the research project also conducted a stop-motion animation workshop experience in Alghero (Sardinia, Italy) in September 2019, that engaged design students in experimenting with this animation technique as a communication design tool by using different visual styles and narrative languages. Students produced four stop-motion short films using objects, paper, fabric, photographs and any other kind of flat element shot on a flat two-dimensional background. As a result of the students' experience, they thought that they could use the technique in their future work since it was revealed to be a very demanding but successful design tool quick to learn and practice and useful to experiment with materials, narrative, visual styles and codes or representation.

Among many others workshop activities involving the use of stop motion animation and digital storytelling, the author conducted a stop-motion animation workshop experience in Alghero (Sardinia, Italy) in September 2019, that engaged design students in experimenting with this animation technique as a communication design tool by using different visual styles and narrative languages. During the five days' workshop students worked in teams and had to follow the main phases of an audio-visual production process: pre-production (subject development, visual style definition, storyboard, puppets, objects, and backgrounds creation), production (camera setting, animation process), post-production (video editing, compositing, sound effects). They produced four stop-motion short films using objects, paper, fabric, photographs and other flat elements photographed on a flat two-dimensional background. As a result of the students' experience, they thought that they could use the technique in their future work since it was revealed to be a very demanding but successful design tool quick to learn and practice and useful to experiment with materials, narrative, visual styles and codes or representation (see Maselli and Mouri 2020).

Educational and didactic objectives

The goal of the Organization for Economic Co-operation and Development (OECD) for 2030 is the redesign of educational processes allowing students to improve skills, abilities and behaviors which have been classified into five socio-emotional competences. These skills range from collaboration to critical thinking, considered values necessary for each individual to effectively manage emotional, cognitive and social life (OECD 2019).

Stemming from the outlined theoretical framework and accepting the objectives formulated by the OECD, integrating them, the research project CCODE places itself as an occasion of convergence between the assumptions of "tactile pedagogy" and the need to redesign educational system according to new and necessary abilities. The aim of the research, therefore, is to provide an alternative learning method by formulating a new process that consider the object of learning, and the learning experience and provide new tools for dealing with it. Specific educational and didactic objectives of the research project are:

- Stimulate creative thinking. Creativity is strictly related to cognitive potential (Runco 2003) and "the thinking capability of children at all levels is significantly influenced by the opportunities they are given" (Cachia et al. 2010, p. 29). In pedagogic context creativity is used generally in a broad way. Sometimes creative thinking is associated to the idea of problem solving, on the other hand it is often used in association with art subject in the meaning of artistic creativity. In this research project the term creativity is considered as a design process attribute by applying Bruno Munari definition of the term. According to Bruno Munari "Creativity does not mean improvisation without method. The design method […] is linked to the creativity of the designer who, in applying the method, can discover something to improve it." (Munari 1992, p. 17). But creativity is not just an essential element of the technical process, being creative is a condition that requests to keep the importance of a subjective dimension of the design experience and to take out something personal and visceral but essential for embracing the design process creatively.

- Encourage collaboration in a social environment. According to the brothers David and Roger Johnson, in learning environment students need to show a positive interaction, an active participation and a visceral feeling of each other (1987,1989). Students feel that they cannot work without one or more group members. They need to work together in a specific direction and with a shared goal but participating with individual and defined skills. At the same time, interaction and cooperation mean that students of a group help each other on specific topics. Cooperative learning also requires developing a self-critical ability to judge the final outcome and to evaluate critical aspects that could have been better approached.

- Develop reflective thinking as a consequence of the exploration of the narrative text and the writing of the screenplay. John Dewey (2014) insisted on the value of the narrative mode of thinking as an opportunity to reflect on experience and, consequently, on social and emotional topic of the contemporary. Storytelling, according to Dewey, has several functions, and one of them is to enter a sphere of interiority and make possible to experience the narrative with a reflective consequence (reflective function).

- Learn new technical skills and knowledge on specific topic. Beside educational objectives, the research aims at verifying the stop-motion workshop experience power to

provide knowledge and improve skills. The workshop is structures into propaedeutic phases that students can face successfully just by developing technical and material abilities and improving the knowledge of topics and analytical methods, that will be explained and verified during the workshop experience.

Research's methodology and structure

CCODE is practical-based research aimed at structuring and verifying the use of an unprecedent learning method based on laboratory approach, and at using interdisciplinary tools coming from fields of pedagogy, animation design, material design, and storytelling. The research project shapes a new synergy between two discipline (animation and pedagogy), two educational approaches (the theoretical-based one, by studying a narrative text, and the practical-based one, by producing an audiovisual artefact), two contexts (educational environment and stop motion animation production dimension), and different objectives (above described), related to the learning of didactic contents and practical tools, the acquisition of cooperative attitudes and the development of creativity and reflective thinking. For testing this new method, an experimental workshop aimed at 5th grade elementary schools' children, supervised by the proponent of the research with the support of experts in the fields of narrative sciences and pedagogy, will be structured. The final outcome of the workshop will be the animated transposition in stop-motion of a "coming-of-age story" that addresses specific social and emotional contents.

In the following paragraphs, the hypothesis for the structure of the workshop will be schematized (Tab.1), and described in detail, including the explanation of carried out activities, material tools, and evaluation methods that will be used to test the method both in terms of the learning contents and acquisition of tools, and in terms of the reaching the mentioned educational objectives.

PHASES	ACTIONS	PARTICIPANTS
1. *CONTACT WITH SCHOOLS, TARGET DEFINITION AND PRELIMINARY EVALUATION*	• Select the primary schools to be involved in the experiment. • Preliminary evaluation. • Confirm target, number of classes involved, timing.	• School's Director • Teachers • Expert in evaluation methods
2. *DEFINITION OF SETTINGS AND PARTICIPANTS*	• Select classes to be involved in conducting the pilot experimentation. • Define topics, themes, narratives to be used	• Teachers • Experimental sample • Control sample
3. *FIRST EX ANTE EVALUATION*	• Formulate the evaluation grid. • Make teachers fill in the GRID to define students' skills and preliminary knowledge.	• Expert in evaluation methods • Teachers • Experimental sample • Control sample

4. STOP-MOTION ANIMATION WORKSHOP	• Sub-phase A. Students read and analyze the narrative text • Sub-phase B. Pre-production • Sub-phase C. production: Assets preparation, shooting	• Teachers • Experimental sample • Expert in storytelling • Expert in stop-motion animation
5. IN ITINERE EVALUATION	• Teachers are requested to weekly complete the evaluation grid	• Expert in evaluation methods • Teachers • Experimental sample • Control sample
6. EX POST ANALYSIS	• systematize the data collected and verify the level of acquisition of socio-cognitive skills during the laboratory experience.	• Expert in evaluation methods
7. FINAL OUTUTP	• - Editing and montage of the final video	• Expert in stop-motion animation

Tab. 1 CCODE_Phases, actions and participants

1. TARGET DEFINITION AND PRELIMINARY EVALUATION

The objective of the first phase of the research project is to select the primary schools to be involved in the experiment. After the selection is completed, a first preliminary evaluation of the project will be conducted. The workshop experience, indeed, is a pilot experimentation and requires to be scientifically validated in order to place itself as a new learning method. An expert in evaluation, the schools' directors and involved teachers will be asked to validate the tools, methodology and objectives formulated. In the same phase director and teachers of each school will be asked to confirm the suitability of the proposed target (second / third grade children) the number of classes involved and the timing (hours / number of weeks) for conducting the workshop.

2. DEFINITION OF SETTINGS AND PARTICIPANTS

In the second phase the classes to be involved in conducting the pilot experimentation of the project will be selected. The classes that will not participate in the workshop will constitute the control sample. The classes that will participate, on the other hand, will constitute the experimental sample. At the beginning of the workshop, indeed, the two samples need to possess the same knowledge about the topic and the selected narrative text, and the same ability in approaching creative and collaborative experiences. This starting parameter is necessary to evaluate, at the end of the experience, which one among the two groups of students has achieved better results in learning contents and addressed objectives.

Topic and contents will be also defined at this stage of the research as they will be formulated according to the didactic unit the workshop will relate to, and developed in agreement and complementarity with the school, the teacher and the class group that will experience the pilot experimentation. Those contents will be arguably based on what is reported by the National Guidelines for the primary school curriculum and the first cycle of education, drawn

up by the Italian Ministry of Education. These indicators identify four fundamental objectives to be inductively obtained during didactic units: "identity", "autonomy", "skills", "citizenship" (MIUR 2018).

According to the strategic program, cognitive, emotional and social skills cross all didactic units and disciplines aimed at structuring the relationship between "the self and the other" which prefigures the promotion of active and responsible citizenship. The workshop, therefore, will depict a didactic unit with structured contents and both didactic and educational objectives, but designing a different method and approach in dealing with them.

3. FIRST EX ANTE EVALUATION

The tool selected to evaluate the effectiveness of the experimental leaning unit is an "evaluation grid", intended to be used before, during and after the workshop experience. In the premilitary verification moment teachers will be asked to fill in the grid to define the students' level of knowledge of technical tools (teaching objectives) and relational and reflective skills on specific topics (educational objectives). This tool is inspired by the Mario Castoldi's "evaluation report" and – as Castoldi's evaluation reports – provides a score for the evaluation of learning, conceptualizes the levels of mastery of the expected skills and provides a useful framework for subsequent comparative evaluations (Castoldi 2016). "Evaluation reports" also investigate other dimensions consistent with the education objective of the project, such as: socialization; reflection; and change by applying a matrix made of specific indicators in order to quantitatively document the carried-out improvement. This kind of tool was proposed for the first time by Corrado Petrucco and Marina De Rossi in 2014 to evaluate digital storytelling products, and requires a top-down approach aiming at verify if intended results have been reached. The three set of parameters that teachers are supposed to investigate by completing the grid stem from the evaluation reports' structure, and slightly edited to better adhere to the content, process and objective of the workshop. Those questions concern:

- The evaluation of technical skills, i.e., abilities students learn during the production and postproduction steps, such as the shooting, the montage with the software, and the audio, photo and video editing (Tab. 2).

- The evaluation of contents, concerning the understanding of topics and meanings dealt with during the reading and analysis of the narrative text, such as narrative structure, style and contents (Tab. 3).

- The evaluation of the process, concerning the workshop experience and aimed at verifying the reaching of the educational objectives above defined: creative thinking, reflective thinking and cooperation (Tab. 4).

CATEGORIES	PARAMETERS TO BE EVALUATED (TECHNICAL SKILLS)
SCREENPLAY QUALITY	Effectiveness of the narrative text translation into a screenplay
ANIMATION SMOOTHNESS	effectiveness of puppets/objects movements and respect of the animation principles
PHOTOGRAPHS	Suitability of shot, composition, light and color
MONTAGE	Suitability of transitions, durations and animation for a clear reading of the image to create an engaging rhythm
AUDIO	Appropriateness of the soundtrack

Tab. 2 Evaluation grid parameters for verifying TECHNICAL SKILLS
Source: Petruccio, De Rossi (2014)

CATEGORIES	PARAMETERS TO BE EVALUATED (CONTENT SKILLS)
CONTENTS	Consistency of addressed contents and themes with the educational objectives chosen for the learning process
STYLE	Suitability of materials, text and technique for expressing specific emotional content
ORIGINALITY	Capacity of the output to express a personal point of view
ETHIC	Contents respect the human being and nature

Tab. 3 Evaluation grid parameters for verifying CONTENT SKILLS
Source: Petruccio, De Rossi (2014)

CATEGORIES	PARAMETERS TO BE EVALUATED (PROCESSUAL SKILLS)
MONITORING	Effectiveness of the monitoring process in the various phases of the experience
SOCIALIZATION	Capacity of the applied method of content analysis and production process to stimulate a continuous and constructive interaction and collaboration within the group
REFLECTION	Results of the experience in terms of generating reflective capacity and stimulating possible changes
CHANGE	Level of behaviors' changes stimulated by the didactic experience

Tab. 4 Evaluation grid parameters for verifying PROCESSUAL SKILLS
Source: Petruccio, De Rossi (2014)

4.   STOP-MOTION ANIMATION WORKSHOP

The stop-motion animation lab. is structured into three sub-phases, hereinafter referred to as sub-phases A, B and C. Activities planned for each sub-phase are:

- During sub-phase A, students will read and analyze the narrative text. The narrative, chosen in agreement with the teacher, will be the same studied and analyzed with classic learning approach and methods, by the control sample. This phase of reading, understanding, analysis of the themes and the subsequent writing of a screenplay will be conducted under the supervision of the teacher and an expert of narratology.

- During sub-phase B, the students of the experimental sample will face the pre-production phase, supervised by the teacher and the experts in stop-motion animation, and in the field of narratology. In this sub-phase the students will draw storyboards, characters, props and backgrounds, they will define the materials to be used to make characters, props and scenographies choosing between paper (cut-out animation), plasticine (Claymation), fabric or objects (animation of objects).

- Sub-phase C is production, divided into two moments:

1) Assets preparation (assets are all the elements necessary to start the animation phase). Much of the production phase of a stop-motion project is based on the preparation: 3D objects and/or puppets and backgrounds must be designed and modelled appropriately to allow effective animation. Puppets and background making phases are the most important experience the workshop will be based on, and involve all students in the experimental sample, who will fabricate puppets and objects designed in the pre-production phase by using defined materials.

2) Shooting. Students will experience the frame by frame shooting process under the supervision of the proponent of the research. By following the storyboard all the photos will be taken to arrive to the fully animated final artefact. Before the shooting students

will be briefly explained how this animation technique works: by taking one frame at a time and then moving the puppet/object with small increments before taking another shot. To complete the animation step, students will be also introduced to the use of a specific licensed software, DragonFrame. This software is professional but easy to use, and during the shooting they will be constantly supervised and guided by the expert in stop-motion animation.

5.   IN ITINERE EVALUATION

For the entire duration of the workshop, as mentioned, teachers will be required to observe the students' progresses, evaluated according to the specially designed "evaluation grid" and complete it according to the three main identified areas of interest: acquisition of technical skills, understanding of contents and experiencing of the production process.

6.   EX POST ANALYSIS

At the end of the workshop, the evaluation grids compiled weekly by the teachers will be collected and the methodology and evaluation expert will systematize the data to verify the level of acquisition of socio-cognitive skills during the laboratory experience.

7.   FINAL OUTUPUT

After the conclusion of the workshop experience, the expert in stop motion animation will edit the animated videos produced by the students and put all sequences together through a montage software in view of the production of the final output.

Conclusion

The described project has not yet been completed and it is not possible to evaluate the data. To date, the project is at Phase two and the professionals and researchers involved are working on the definition of the evaluation grids to be completed by teachers during the phase three of preliminary evaluation.

Stop motion experience as learning method, as mentioned, is not new and the process of film production has been already used to teach aspects such as animation principles, craft skills and team work. What is new in the described research is the focus on the process of material manipulation as if material, when used to shape something previously understood narratively, could be a successful vehicle of knowledge. Described pilot experimentation will reveal limits, advantages or critical points thanks to the evaluation tool applied to control learning objectives. The evaluation tool will then suggest what and how redesign, if necessary, methodological, approaches, steps and/or the addressed target.

By integrating stop-motion, material design, storytelling and pedagogy, the interdisciplinary workshop can be considered new in an international perspective and worthy of seeing its potential verified in the future. The formulated learning experience stems from methods theoretically and empirically validated, and approaches that pedagogy has used in the last century to enhance sensory experience, collaboration and action within the educational process, but goes beyond these premises by making an interdisciplinary leap that brings together analysis of the narrative text, creative writing and design. The method becomes an alternative didactic unit and could potentially prove to be applicable to any content, discipline

and educational context, not only the study of narrative texts, also mathematics, history and geography or foreign languages.

References

Barone, P. (1997). *La materialità educativa. L'orizzonte materialista dell'epistemologia pedagogica e la clinica della formazione*. Milan: Unicopli.

Bruner, J. (1966). *Toward a Theory of Instruction.* Cambridge: Harvard University Press.

Cachia, R., Ferrari, A., Ala-Mutka, K., & Punie ,Y. (2010). *Creative Learning and Innovative Teaching. Final Report on the Study on Creativity and Innovation in Education in the EU Member States*. JRC European Commission.

Castoldi, M. (2016). *Valutare a scuola. Dagli apprendimenti alla valutazione di sistema.* Roma: Carrocci.

Dale, E. (1969). *Audio-Visual Methods in Teaching (3rd ed.).* New York: Dryden Press.

Dewey, J. (1899 [2008]). *The School and Society.* New York: Cosimo Inc.

Dewey, J. (1938 [2014]). *Esperienza e educazione.* Milan: Raffaello Cortina editore.

Fenwick, T., Edwards, R., & Sawchuk, P. (2011). *Emerging approaches to educational research: tracing the socio-material.* London: Routledge.

Fenwick, T., & Landri, P. (2012). Materialities, textures and pedagogies: socio-material assemblages in education. *Pedagogy, Culture & Society, 20(1),* 1-7.

Grant, D. (2009). Stop-motion animation. Digital storytelling in the classroom. *ETFO Voice,* 19-23.

Harryhausen, R., & Dalton, T. (2008). *A Century of Stop-Motion Animation: From Melies to Aardman.* New York: Watson-Guptill Publications.

Hatten, S. (2014, August 15). *Engage elementary students with stop animation!* ISTE. https://www.iste.org/explore/Toolbox/Engage-elementary-students-with-stop-animation%21

Johnson, D.W., & Johnson, R.T. (1987). *Learning together and alone: Cooperative, competitive, and individualistic.* Englewood Cliffs: Prentice Hall.

Johnson, D.W., & Johnson, R.T. (1989). *Leading the cooperative school*. Edina: Interaction Book Company.

Kolb, D. (1984). *Experiential Learning: experience as the source of learning and development.* Englewood Cliffs: Prentice Hall.

Maselli, V. e Mouri, E. (2021). Abstract to figurative, and everything in between: visual design approaches and linguistic codes of a traditional form of animated product. *Design Culture(s). Cumulus Conference Proceedings Roma 2021, Volume #2,* 645-658.

Massa, R. (1975). *La scienza pedagogica. Epistemologia e metodo educativo.* Florence: La Nuova Italia.

Massa, R. (1986). *Le tecniche e i corpi. Verso una scienza dell'educazione.* Milan: Unicopli.

MIUR. (2018). *Indicatori nazionali e nuovi scenari.* DG ordinamenti

Montessori, M. (1952 [1999]). *La mente del bambino.* Milan: Garzanti.

Munari, B. (1958). *Le forchette di Munari*. Milan: La giostra.

Munari, B. (1992). *Da cosa nasce cosa: Appunti per una metodologia progettuale*. Bari: Laterza.

OECD. (2019). *Making Physical Education Dynamic and Inclusive for 2030*. Future of education.

Petrucco, C., & De Rossi, M. (2014). *Narrare con il Digital Storytelling a scuola e nelle organizzazioni.* Roma: Carrocci.

Runco, M.A. (2003). Education for Creative Potential. *Scandinavian Journal of Educational Research, 47(3),* 317-324.

Sharan, Y., & Sharan, S. (1992). *Expanding Cooperative Learning Through Group Investigation.* New York: Teachers College Press.

Valitutti, S. (1964). Maria Montessori nel suo e nel nostro tempo. *Vita dell'infanzia. Rivista mensile dell'Opera Nazionale Montessori, XIII (5),* 11-17.

Contact email: vincenzo.maselli@uniroma1.it