Between creative process and creative product: DoCENT Mooc for the integration of technology, creativity and learning

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Abstract. In this paper, we describe an approach that integrates in an educational tool, namely a MOOC, creativity and digital aspects. Starting from a brief introduction on the attributes that such an approach must have: creative, digital and "open", this paper describes how these aspects can find their place in educational contexts, giving birth to creatively digital and digitally creative learning environment.

Keywords: Mooc, Creativity, Technology, Learning

Introduction

Creative, digital and "open" are three key-words to describe socio-cognitive challenges of our era, pervasive in every aspect of our daily life. Educational research, mirroring this twist, has generated many methodologies, tools and practices exploiting the potential of technology in education. However, the effort to bridge technologies and open resources with creativity in a learning process remains quite low. This paper describes how creative, open and technological can become the core attributes of new training approaches and tools.

Creative, digital and open

Creative. Creativity is a term that indicates the cognitive ability to create and invent something new and valuable. A wide definition describes creativity as the ability to generate ideas, insights and solutions that possess the feature to be original and flexible [1, 4, 6] or original and effective [5]. Thus, the term "creativity" refers to

different dimensions about which there is not a shared consensus [18]. Anyway, according to Rhodes four Ps model [17], we can identify four relevant dimensions, different sides of this complex concept: a. Process; b. Product; c. Press; d. Person. The first dimension, process, is connected with the cognitive dimension of creativity that leads to new ideas. In a schematic representation this process can be divided in different steps: first of all, the problem or the task is identified, thus triggering the subsequent steps that include preparation, response generation and validation, the communication to others, at the end, the outcome. Creativity consists in following these steps in an unforeseen and unusual way, anyway leading to a new product. Product is indeed the second dimension of creativity and includes material elements such as artefacts, artworks, innovative tools, as well as immaterial elements including theoretical perspective, new frame of reference, etc. Also, the external environment, press, where creative process takes place, plays a relevant role. The fourth dimension is person and refers to personality and cognitive traits that define a creative person. They include broad interests, independence of judgement, openness, intrinsic motivation, creative self-concept [2, 7,10, 11, 20].
Creativity is therefore important, at individual level, as an individual resource [21], a way to adapt and as a latent power. In fact, literature highlighted that creativity could be interpreted as an individual resource, mostly in terms of adjustment. Indeed, creativity was considered one of the main personality traits useful both for adaptation and maladjustment of individuals to environment [10].

Digital. Technology is pervasive in many fields, including education where it has produced the so-called Technology Enhanced Learning approach (TEL, learning boosted by technology), a broader and more far-reaching idea than concerns the impact on learning and teaching. Recent international studies [22] have in fact highlighted how the use of tools in digital mode is now part not only of people habits, but directly affects the cognitive, affective and relational development of individual from the early stages of life. Moreover, from a socio-relational point of view, it is evident how the use of new digital technologies (transposed online, see social networks) is configured as a real form of social activity [14]. Recently, some research approaches have proposed to join the digital side to the physical ones [8, 9, 16, 25, 26], giving an idea of how much is relevant the digital in the present days.

Open. "Open" has become a crucial word in the last decade [12, 13]. The "open" philosophy has inspired one of the most important educational movements in the last decade (Open Access) whose basic idea is to promote shared values and principles in the way of thinking about creation, organization and sharing of knowledge, conceptualized as a common good [24].

Teaching/learning contexts have hosted "digital" and "open" idea: the first principle of the open philosophy in education is that the sharing of "knowledge is a good thing to do" and the sixth declares: “open sharing will speed up the development of new learning resources, stimulate internal improvement, innovation and reuse” [15].

The DoCENT MOOC

MOOC is an open access type of online course (Open Access), which provides for extensive participation via the web (Massive) based on the use of open educational materials (OERs) that can be produced by the institutions themselves that organize these courses, or even taken freely from OER communities. The term MOOC, acronym of Massive Open Online Course, coined by David Cormier [3] now refers to a variety of online and blended courses.
The DoCENT Mooc hosts the first attribute, *creative,* as well. Indeed, Online modules in the MOOC focus on how to use the technologies suggested by the project and how to apply them in educational contexts to promote digital creativity. Following a sandbox approach, teacher educators will be able to choose among the available modules, according to their teaching interests, objectives and contexts.
The Docent MOOC covers the main issue of the DoCENT project, Digital Creativity ENhanced in Teacher education, funded under ERASMUS + framework. It will be made up of 8 lessons, with textual material and introductory videos. The goal of the MOOC is to give teachers and teachers' educators some indications to make their lesson more digitally creative and creatively digital and to describe some tools that can be included in their teaching routines [19, 23].
Moreover, each lesson is enriched by relevant additional materials. The on-line modules focus on how to prepare teacher educators to teach creatively through digital technologies. They include the MOOC and the OER.
According to the project, the curriculum includes the following topics:

Table 1**.** DoCENT Mooc main topics

- **Main concepts and pedagogical approaches** around digital creativity
- Introduction to the model of **digital creative teaching competences for ITE**
- **Pedagogical approaches and associated technologies** to foster digital creativity, i.e. GBL (Minecraft, Game Maker, etc.), robotics (e.g. Lego Mindstorm and Wedo), manipulative and tangible technologies (e.g. Blockmagic)

- Design and application of **digital creative learning scenarios**, based on teachers' interests and areas of expertise

Following this structure, the MOOC index is the following:

Lesson 1: Digital creativity in education
UNIT 1 - Defining creativity
UNIT 2 - Creative education
Lesson 2: Digital creativity in education: the DoCENT approach
UNIT 1 - DoCENT competence framework for digital creative teaching
UNIT 2 - Digital creative pedagogies: GBL, tangible interfaces, educational robotics and STEM education
Lesson 3: Approaches and tools for integrating digital creativity in Teacher Education
UNIT 1: Game-based learning, gamification and serious games
UNIT 2: DoCENT approach to GBL
Lesson 4: Digital creativity through tangibles interface
UNIT 1: theoretical introduction,
UNIT 2: application and examples
Lesson 5: Digital creativity through educational robotics
UNIT 1: theoretical introduction,
UNIT 2: application and examples
Lesson 6: Digital creativity for STEM education
UNIT 1: theoretical introduction
UNIT 2: application and examples
Lesson 7: Inquiry-based learning
UNIT 1: theoretical introduction
UNIT 2: application and examples
Lesson 8: Evaluation about Digital creativity
UNIT 1: evaluation models and framework,
UNIT 2: evaluation tools

The DoCENT MOOC is hosted by the Federica platform, that provides:

- a learning space: the platform will host the learning activities of the MOOC on-line modules, the serious game and the OERs.
- a collaboration space: the platform will offer a wide range of social networking tools to facilitate communication (either synchronous or asynchronous) and collaboration, e.g. forum, wiki, blog, chat, online videoconferencing. These

functionalities will facilitate the development of partnerships among teacher educators and EdTech stakeholders, as well as the creation of a sustainable CoP. Furthermore, users will be able to upload their own resources (user generated content).

Conclusion and future directions

In the challenge that education is called to meet, a relevant role is played by teachers, as they are, together with students, the leading characters on the education stage. In education, creativity can stimulate imaginative activity generating outcomes that are original and valuable in relation to the learner and digital technologies can be the medium to promote creativity, under the guidance of teachers that promote creative expression by the means of digital tools, teach how to use digital tools in a creative way, design, implement and propose to learners creative learning scenarios. The DoCENT Mooc represents an open digital source, theoretically based and psycho-pedagogically validated course to explore and boost up teachers' creativity processes in order to implement creative educational products, that in turn promote students creative learning.

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