Digital creative learning: a proposal for distance learning

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Abstract

Changes in educational activities related to the Covid-19 pandemic implied a massive passage from traditional education practices to distance learning activities. The paper proposes a theoretical framework based on Self-Determination theory, aimed to promote educational success in distance learning activities mediated by digital technologies. A learning model (ACL) and a teaching model (ACT), aimed to study and enhance the psychological processes involved in education and learning are presented. The key factors of need for competence, autonomy and creativity are analyzed and described.

Keywords 1

Creative Learning, self-determination, digital creativity, technology

1. Introduction

The Covid-19 pandemic can be conceived as a multidimensional, complex phenomenon. While most of the discussion related to the spread of coronavirus turned around the health issue, and, secondarily, to the economic consequence of the pandemic, almost every aspect of society has been touched by changes linked to prevention measures organized to fight the virus [1]. While school and university closures seem to be effective in containing the spreading of the pandemic [2], education systems of all over the world are facing the issue restructuring their functioning because of the epidemy. While we are writing (January 2021), in every country of the EU, schools are completely or partially physically inaccessible. During the last year, primary, secondary and tertiary education institutions made a massive and forced use of distance learning practices (DL). DL practices are mainly mediated by the use of digital devices (computers, but also tablets and smartphones) that enable the creation of a virtual environment simulating the classroom and/or other educational situations. With the rapid technological expansion of the last years, schools and universities were slowly introducing new technologies for supporting learning activities. For this reason, questions regarding an adequate use of digital technologies in education were already present in the field of education studies [3, 4, 5]. In particular, two types of question emerged from the research:

1. How to select and design digital tools for reaching educational goals and support students in their development?

2. How to adapt the teaching methodologies to the virtual context in a way that fits the virtual environment properties?

With Covid-19, the urgency to answer these questions increased unexpectedly.
This paper aims to provide a hypothesis of answer to the second question, proposing a model for enhancing the students' online participation in virtual educational activities.

Proccedings of the First Workshop on Technology Enhanced Learning Environments for Blended Education (teleXbe2021), January 21–22, 2021, Foggia, Italy
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2. Beyond Relationships: What Changes in Distance Learning

Constructivist approaches conceive learning as a process that happens in the social context in which the individual acts. From this perspective, social constructivism focuses on the role of society in the learning processes and underlines that relationships are core variables in these processes. In other words, as stated by Kukla [6], knowledge is not transmitted but actively and culturally built, and it's the result of the interaction with others and with the environment.

Interactions finalized to learning, as highlighted also by Crook [7], may happen also thanks to contemporary digital technologies, stressing their connective properties. Communication, mediating the interactions between human beings, gets amplified thanks to the speed and power of the technological means that allow using written, but also visive and oral forms of communication, that can facilitate and support learning-oriented interactions.

The role of computers in learning processes has been a topic of interest in the field of studies of Computer Supported Collaborative Learning (CSCL) which aims to promote the potentialities of computers in encouraging socially constructed learning. In line with this, many benefits are coming from technological support to learning. According to Lipponen [8], the main advantages are: the absence of time-space limits, the possibility of mixing synchronous and asynchronous communication, greater opportunities of confrontations, critical analysis, sharing and cooperation, and the natural creation of a shared memory related to the permanence of files uploaded and saved on digital platforms.

Even if technology is one of the environments of the individual as intended in Bronfenbrenner's definition of environment, both the teacher and the students need to adapt to new tasks that are embedded in the technology that they use. The teacher needs to adapt to different aspects of his educational role. He needs to use and create new strategies of active involvement of students in learning processes, using different strategies of support and create new ways of teaching. The student is asked to more responsibly take part in the learning process, becoming more agentive. Both the actors need to be capable of tune in to each other, recognizing the borders between the need for autonomy and the need of having a guide.

2.1. From classroom structured learning to autonomy learning

Technological means, moving the focus of responsibility in learning from the teacher to the student, can foster the autonomy of the student. In line with Harmer [7], it may also facilitate a passive attitude of the learner, harming the learning process itself. Contrarily to this, learning processes characterized by autonomy, imply the construction of personal learning strategies in line with one's cognitive modalities. These strategies allow the achievement of one's own potential. The ability to create is not the effect of an automatic process. The individual usually needs to be properly motivated and trained to become autonomous in his process of learning [10].

In the classical definition of Holec [11], an autonomous student is a student capable of managing his own learning. In line with this, an autonomous student takes responsibility for determining the goals, the rhythm, the content, the learning methods, and for monitoring his own progress and assessing his achievements. Starting from this definition, Hu and Zhang [10] clarify that the student's autonomy is closely related to self-determination. For this reason, learning motivation and abilities are two fundamental prerequisites for autonomous or self-regulated learning. When it comes to considering autonomy as related to self-determination, as theorized by Deci and Ryan [12], volition and self-learning need to be considered.

Self-determination theory (SDT) explains the relation between the human needs of autonomy, competence, relativity with self-determined motivation and self-regulation behavior. If we apply this theory to learning, those who show an intrinsic motivation to learning are also capable of modulating their own processes of learning and show curiosity, seem to be more motivated in making a commitment in this field [13,14, 15, 16].

2.2. Autonomy in learning as a key element to meet the need for competence (self-determination theory)

The *self-determination theory* [12] assumes that people are animated in their growth paths by three innate and universal psychological needs (competence, autonomy, and connectedness). Among them, the need for autonomy and competence seem to play a key role in learning processes. The first one refers to *behavior as volitional and reflectively self-endorsed*; instead, the need for competence refers to a feeling of effectiveness and to perceive him/herself as capable to achieve goals.

Authors identify in the need for autonomy and competence the core variables for the creation and maintenance of intrinsic motivation which would be essential to successful learning. Analyzing results from different research that apply SDT to learning, Niemiec and Ryan [17] highlight that satisfaction of both needs contributes to helping the individual to feel competent in his learning process supporting his creativity and better learning achievements. Finally, the authors underline that how the teacher acts as facilitator or opposer of the satisfaction of needs and competence has a direct impact on intrinsic motivation to learning and, consequently, to the goals to learn.

2.3. Why the need for competence is a key factor for positive psychological development

The satisfaction of universal psychological needs of competence, autonomy and connectedness, as underlined by Ryan and Deci [18, 19] is not only linked to learning. It is also connected to the overall individual's well-being, that may be influenced also by his experience in school, being the context where children and teenager spend most of their time. The authors highlighted that the results confirmed how theorized by SDT. The support to the students in satisfying basic psychological need is important not only for creating and maintaining intrinsic motivation, as previously stated, but also for psychological well-being

Martela and Sheldon [20], starting from the Eudaimonic Activity Model, propose a conceptualization of well-being that includes eudaimonic activities/motivations, satisfaction of needs and SWB, indicating psychological needs as central elements for well-being. In line with the authors, several studies demonstrated that competence, autonomy and connectedness, when satisfied are linked to well-being indicators while when frustrated can be related to maladaptive indicators, depression, negative affect and burnout [21, 22].

3. The Creative Teaching/Learning model: A proposal for the enhancement of Distance Learning

Summarizing what has been described, the possibility of intervening on the needs of competence and autonomy seems to be a central factor for successful learning, that is, for experience and meaning based learning. This type of learning constitutes the privileged target for educational psychology.

In traditional contexts of teaching/learning, psycho-pedagogical praxis is somehow consolidated. The field of study of virtual learning contexts is still in a work-in-progress status. What is happening in this historical moment can be considered an extremely intense moment of exploration. Complications related to the massive use of DL are well-known and are the consequences of the difficulties in creating a (computer-mediated) active engagement of students. The question related to the role of active learning is once again essential. Attempting to give an initial answer, we shall present the nuclear element that we consider as essential for stimulating intrinsic motivation: creative learning. Educational psychology has long studied the learning processes and the ways that allow them to be enhanced [23]. Recently, the fundamental role of intrinsic motivation within learning processes has been underlined. Being genuinely interested in a topic, flow and curiosity seem to be fundamental factors in stabilizing learning and, at the same time, it promotes exploratory behaviors that indicate to expand one's sources of knowledge

[24]. Some psychologists define this dynamic as the stimulus of curiosity, others emphasize the importance of the emotional and self-evaluation dimension connected to it, referring to the sensation of flow [25]. Referring to curiosity, many scholars have hypothesized its key role in learning processes. It was conceptualized as a form of intrinsic motivation that has a crucial role in fostering both spontaneous exploration and active learning. Thus, curiosity-driven learning and intrinsic motivation have been pointed out as fundamental elements for efficient education [26]. On the other, two types of curiosity can be detected [27], perceptual (the impulse that is activated by new stimuli) and epistemic (the desire for knowledge). These two types of curiosity could be also distinguished between specific (desire for particular information) and diversive (a more general search for stimulation). According to this approach, curiosity is defined as the predisposition to recognize and seek new knowledge and experiences [28].

From our point of view, intrinsic motivation, curiosity, flow and exploration constitute joint processes that all lead to a search for active knowledge, characterized by individual commitment, ability to independently manage new information and integrate it into a coherent and renewed *unicuum*, as well as a constant need for novelty and ability to face the challenges that confronting the new implies. Most of these characteristics relate to the processes are involved in creative thinking. Even without going into the more than extensive literature on creativity, it is worth remembering what was stated about the relationship between curiosity and creativity and creativity and risk-taking [29]. Defining an affective dimension of creativity, Williams [29] indicated four dimensions; including curiosity and risk-taking: curiosity (as the capacity to investigate elements and ideas, finding new and not obvious connections between them); complexity (as the tendency to look for new alternatives and solutions to problems, with the aim to restore order); imagination (as the ability to visualize the mental images); and risk-taking (as the ability to act under unstructured conditions and to defend one's own ideas). At this point, it is possible to deduce that learning process could represents a particular case of a creative process during which people combine their previous knowledge with new information in a way that is unique for them.

What we have presented here allows us to describe our model (Figure 1). It seems to us that intrinsic motivation-learning-exploration-curiosity-flow can be considered together creating a positive model of "active creative learning". Dimensions presented on the left (intrinsic motivation-learning-exploration-curiosity-flow) all contain a common dimension: creative thinking.

Enhancing creative thinking can lead to the possibility of autonomously managing information and knowledge, as well as to the possibility of originally building personal paths and building construction of knowledge, satisfying the autonomy and competence need that guarantee well-being and self-determination.

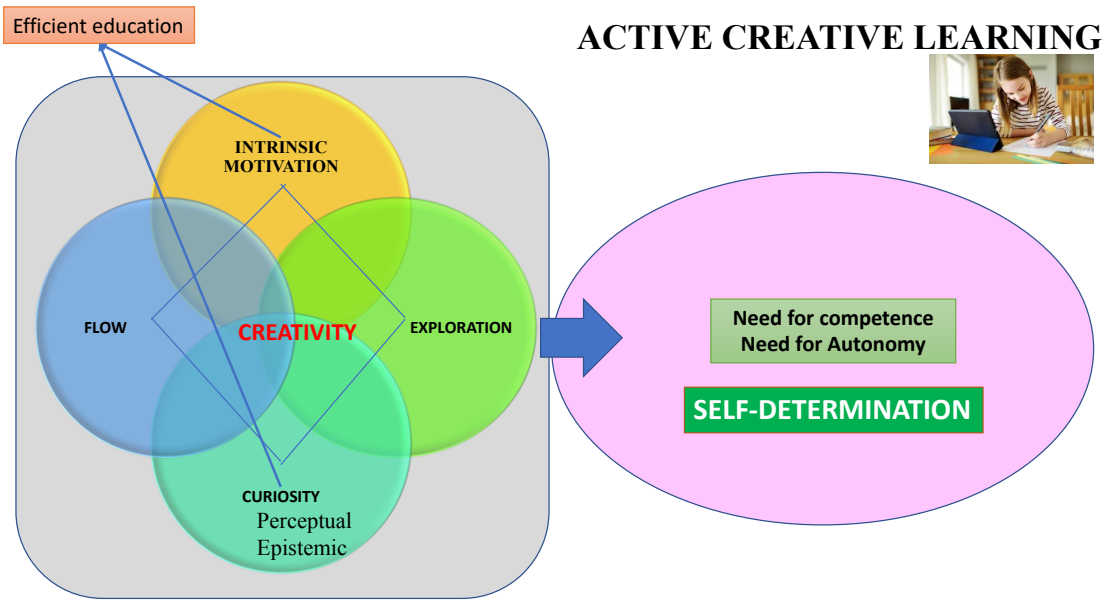

Figure 1: The Active Creative Learning Model

Psychological research can provide indications or tools useful to promote ACL (Active creative learning). The use of "game" (intended as a digital game), as a mediator in an active and exploratory process of knowledge, can be considered one of the most powerful tools in this sense. The use of new technologies based on exploratory behavior and on game is an ever-wider range of application, with respect to which a fairly large amount of empirical evidence begins to be available [30]. To summarizing, we can say that playing implies learning and this feature can be exploited to make games a useful vehicle to transfer knowledge. Indeed, educational games are motivating and lead to "flow" experiences [31].

On the other hand, also a more open and flexible form of teaching - based on times and methods more easily manipulated by students, without physical boundaries and based on an open model of knowledge use - such as that of MOOCs represents a response to the goal of strengthening intrinsic motivation. As argued by Oudeyer, Gottlieb, and Lopes [32] a line of research has considered how formal and computational models of curiosity and intrinsic motivation could be applied to intelligent tutoring systems and MOOCs, mainly to personalize teaching sequences using artificial intelligence techniques.

In other terms, from an operational point of view, we're moving from Active Creative Learning to Active Creative Teaching (Figure 2), where centrality for success in enhancing learning is due to the creative way of teaching. In the figure, we represent the elements that may characterize teaching which promotes creative learning: inquiry-based learning approach, promotion of autonomy, exploitation of creativity. What can allow these elements to work in DL context is the creative use of technologies.

Examples of tools and strategies for digital creativity promotion can be found in the output of Docent Project, an EU-funded project aimed to precisely develop tools for this scope (https://docent-project.eu).

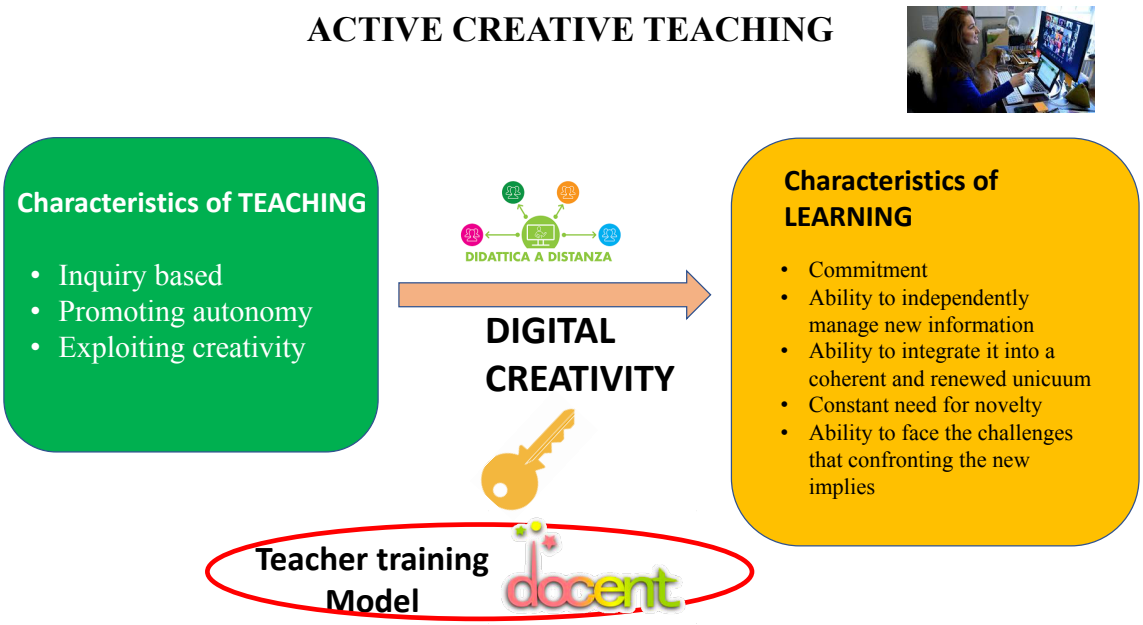

Figure 2: The Active Creative Teaching Model

4. Conclusion

The model presented in this paper aims to highlight the strong link between intrinsic motivation-learning-exploration-curiosity-flow, not only to support successful learning but also to have an increase the sense of competence which has a central role for the well-being of the person.

This type of approach (digital creative learning) allow considering learning as a personal skill that goes towards the creation of the meta-skill of learning to learn [33] that represent a real individual resource since learning is not only a school content-related process, but also the cognitive process which allows the individual to understand the reality and to interact with it.

5. References

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