

Chapter 2

ICT and Collaborative Creativity in Modern School Towards Knowledge Society

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Introduction

Nowadays, teachers and students face a major challenge, as they are called to cover a great distance that separates knowledge and skills, given by the school of today, from the knowledge and skills, which are necessary for the future citizen of the emerging Knowledge Society. If we really believe that resignation and sterile negation are the other side of the same coin, then we should look for new, original and innovative ideas that could lay the foundations of an alternative—creative approach to educational issues. ICT, under pedagogical conditions, may be one of the most important tools for teachers and students to develop crucial skills (cognitive, social, and technological) so as to be able to respond, critically and creatively, to the needs of the new social and economic reality that is, constantly, changing.

First of all, the purpose of this paper was to highlight the collaborative creativity (CC) as one of the most important issues for the critically thinking teacher of today, and, second of all, is to explore ways through which ICT can support him in this effort. The structure of this paper is as follows: In the first section, there is an attempt of, initially, mapping the features of the emerging social reality. The second section clarifies the concept of creativity and emerges the importance of it in today's era of intense change and uncertainty. The third section focuses on the role of ICT as a critical factor for encouraging the collaborative creativity. The forth section is a brief reference of the ODYSSEUS Program 2012–13, in which ICTs were used in order by students and teachers to design and implement creative activities, collaboratively and remotely.

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What Changes in Our Days?

In the era of globalization and internet, knowledge is the main productive factor of the new form of the social and economic organization (Tapscott 1995; Anderson 2008). The aim of societies must be the strengthening of social capital, meaning all the actual and potential resources, that are incorporated, are available and come through the network of relationships, which an individual or a group keeps (Nahapiet and Ghoshal 1998). Furthermore, the role of creativity is important to achieve this goal (Walberg 1988, p. 342). Knowledge is one of the goods moving through this network and ICT plays an important role (Van Bavel et al. 2004), by reducing the distance between the urban centers and rural areas (Westlund and Kobayashi 2013), but by creating new kinds of social inequalities based on age and internet access (Brandtzæg et al. 2011).

In today's school, we educate the future citizens of a society for which we do not have the slightest idea of how it will be after a few years.

Rapid social and economic changes contribute to the emergence of a new reality, which includes these features:

- a. *Shock of Information overload*: the increasing amount of information, available, now, on the web, results in creating the shock of Information overload phenomenon (Brown and Duguid 2000; Bawden and Robinson 2008; Murayama et al. 2015; Lee et al. 2016).

Today, the challenge is to gain the ability of:

- focusing on information literacy: The ability to recognize, search, assess, organize and create synthesis and utilization of information disseminated in order to process a subject or to give a solution to a problem (UNESCO 2003), taking validity and timeliness into consideration (Anastasiades 2007). This requires the cultivation of information search skills, imagination, and originality.
 - Cultivating the capacity of assessing and identifying significant or authentic information (c), that is to cultivate critical thinking.
- b. *The Rapid Devaluation of Knowledge*: in the so-called society of knowledge and uncertainty (Hargreaves 2003) knowledge devaluates rapidly (Kaufman 2006), a fact that requires us to rethink the way we deal with the concept of teaching and learning, focusing on how our students learn (Laurillard 2002; Anderson 2008).
 - c. *The multiplicity of information*: today's era urges us to (Johnston 1998):
 - seek new knowledge from different sources,
 - to realize that there are different kinds of knowledge and multiple ways of looking, interpreting and solving problems,
 - focus on new forms of perception and meaning acquisition, concerning the world around us (Makrakis 2000, p. 247).

In order to achieve the above, we have to encourage the release of thinking from its reveling standardization, nurturing, in teachers and students, the alternative viewing of things and multiple ways of solving problems.

d. *Global networking-cooperation*: the possibility of global networking among researchers, teachers, and students creates the conditions for a new, participatory culture (Jenkins 2006), respecting individual social and cultural environments. In this context:

- we strive for constant contact and cooperation with others who have common interests and worthwhile practices (Smith and Lovat 2003)
- we cultivate the culture of sharing knowledge, experience and life experience, with the help of social networking environments and web 2.0 (Anastasiades and Kotsidis 2013).

Summarizing, based on the above four features of the new social, emerging reality, teachers and students should focus their interest in the cultivation of critical thinking: (a) on highlighting originality, imagination, and innovation, (b) on the encouragement of alternative viewing of things, (c) on the pedagogical use of making mistakes, aiming at building collaborative, learning environments and creative expression.

Meaning and Importance of Creativity in Modern School

As understood, the concept of creativity gets a special added value for educational systems, in this era of constant change and structural realignment (Hargreaves 2003; Ball 2008, p. 39). This reflects at both European (Work Programme Education & Training 2010; Commission of the European Communities 2008) and national level (Leonidou 2006; Xanthakou 1998; DCMS 2001).

Overviewing international literature, the concept of creativity could be traced through four conceptual, tangent circles (Fig. 2.1).

1st circle: a large number of researchers focus on imagination, originality, and innovation, as the characteristics of creative thinking (Bruner 1962; Getzels and Jackson 1962; Torrance 1966; Lytton 1971, Reber 1985; Vernon 1989; Savoie 2015; Brand 2013; Fraser 2007; Plsek 1997; Wimmer 2007).

2nd circle: an important prerequisite for the cultivation of creativity is to encourage different viewing of things (Lee et al. 1987; De Bono 1967; Trilianos 1997; Savoie 2015; Bailey et al. 2016), the development of divergent thinking and the formation of new relationships (Salla-Diakoumengidi 1996). Different kinds of expression (in metaphor: such as..., pro rata: it is not/it is, symbolically: poetry/art, practically: solving a problem, schematically: Shape, etc.), combined with the active participation of students in building knowledge (Makrakis 2000: 247), are important factors for developing creativity in education.

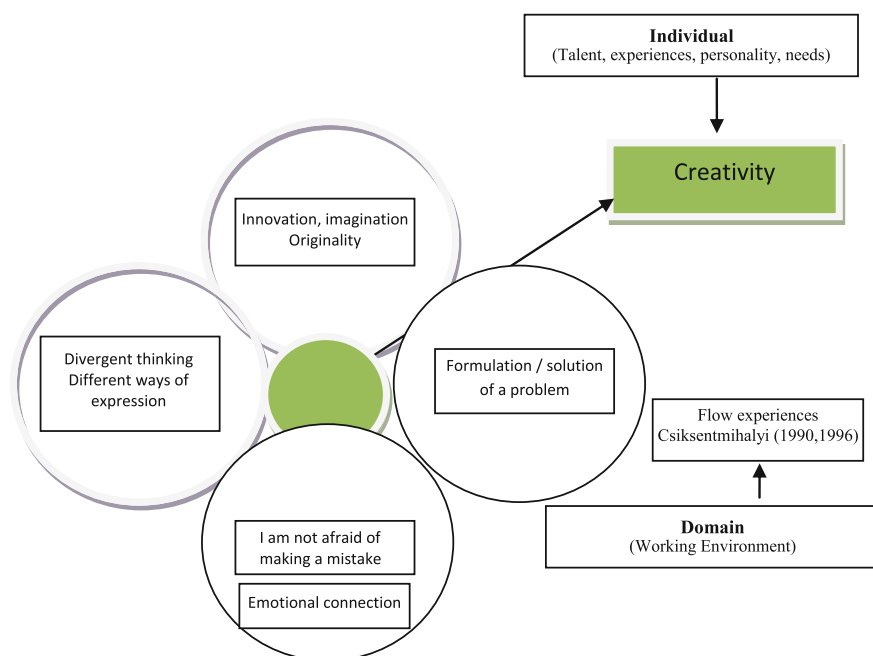


Fig. 2.1 Conceptual depiction of creativity

3rd circle: according to several researchers, formulating a problem is a much more important process than solving it (Piaget 1960) and contributes to the development of creative thinking (Kaila and Xanthakou 2002; Morris 2006).

4th circle: pedagogical use of making a mistake, emotional climate:

The standardization of thinking, the absolute sovereignty of logic, the lack of confidence in our creative abilities, the fear of error and ridicule, the social frame that presses for compliance and, finally, the psychological insecurity for the new and the unknown are the most important barriers, relating to creativity, according to Paraskevopoulos (2004).

According to Kampylis (2010), the Greek teachers of primary education have no clear picture, with regard to creativity, and often have such perceptions that do not help in further development of it. This fact is due to both their initial education and the content-methodology of their training. This conclusion is consistent with the corresponding research of Loveless et al. (2006), which highlights the importance of teacher training, while Webster et al. (2006) point to the need for a good preparation period for the teachers.

Collaborative Creativity (CC) and the Role of IST

According to socio-cultural approaches, creativity has a special added value, when it takes place in collaborative environments (Littleton and Miell 2004; Sawyer 2007), without invalidating the fact that individual, creative activities have a strong, social dimension (Ivinson 2004).

Under CC, interest focuses on the following: (a) the mutuality between the team members, (b) exchanging ideas, experiences, and life experiences, (c) exploring a common vision, (d) negotiating a collective sense (Glăveanu 2011). On the other hand, research does not focus, only, on the content of creativity (what and how), but also, on the sociocultural frame, in which it is carried out (De Laat and Lally 2004).

In particular, within the school environment, nowadays CC is one of the most important requirements for the critical integration of students in the society of knowledge (Craft 2008; Daskolia et al. 2009; Cachia et al 2010), as it contributes to their socio-emotional development and the emergence of strong, internal motivation (Littleton and Miell 2004).

In pedagogical conditions, ICT can support the development of CC in modern school through three interrelated practices (Loveless 2003, 2011), which are depicted in Fig. 2.2:

According to Wheeler et al. (2002), ICT can contribute to the development of creative thinking, through three interrelated dimensions: problem solving, creative knowledge, and social interaction. Howell (2012) argues that creative activities, combined with the exploration of knowledge, maximize the expected results, both in terms of knowledge and skills of students.

In recent years, the development of web 2.0 pushes the support of creativity, as these applications allow ordinary users to create, publish, and share content (i.e., text, picture, and video) (Bush and Hall 2011; Daud and Zakaria 2012; Kurtz et al. 2012).

The important feature of web 2.0 is that it encourages and supports the simple user to create content with others (collaborative creation), promoting interaction and communication between them (O'Reilly 2005). Indeed, Jenkins (2006) states that web 2.0 marks the participatory culture, in which there are many opportunities for

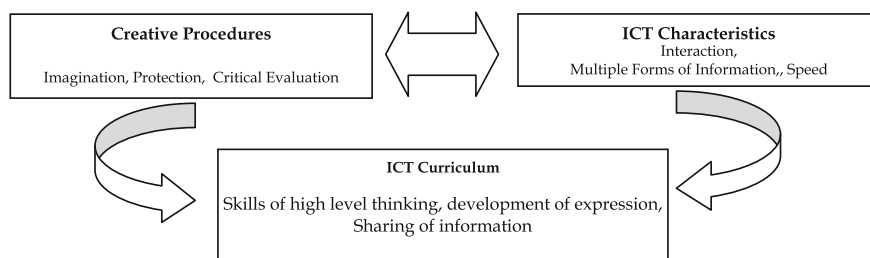


Fig. 2.2 ICT framework to support creativity

someone to create and participate in collaborative learning, thus becoming a global citizen (citizen of the whole world), capable of communicating and working in different frames.

In conclusion, ICT contributes to encouraging participatory culture, by creating and sharing content in different social and cultural contexts. Therefore, under pedagogical conditions, it can contribute to the development of collaborative creativity in the classroom.

From Theory to Practice: Encouraging Collaborative Creativity for Primary Students by Using Advanced Learning Technologies

According to Ripple (1999), we can distinguish two basic strategies to enhance creative thinking. The first one focuses on teaching techniques and the use of specially designed activities, such as open questions and vaguely formulated problems. The second one focuses on innate creativity, which can be highlighted, by removing barriers and realizing our creative capabilities. An important prerequisite for encouraging it is to create the right emotional climate in order teachers and students not to be afraid of making mistakes (Robinson 2008). To achieve this, it is important that the student is encouraged to express emotions in comfort (Russ 1993: 12–16), open to experiential situations, which will give him the ability to recognize and process them (Russ 1993: 38–42).

The design, development, and implementation of collaborative, creative activities via advanced learning technologies (videoconferencing, web 2.0 etc.) are the core of the ODYSSEUS Program, which is implemented by the Department of Primary Education of the University of Crete. It began its exciting route in 2000 in Cyprus and until 2013, 1800 students, 50 teachers from 20 primary schools in Greece and Cyprus (www.edc.uoc.gr/~odysseas/).

Under the term of “Videoconferencing” we refer to the communication in real time through audio, live video, and data, between two or more remote places. (Anastasiades 2003; Alexander et al. 1999; Chandler and Hanrahan 2000). Interactive Videoconferencing (IVC) allows trainees and trainers, who are in two or more remote places, not just to communicate, exchanging opinions, or to share data between them, but also to actively participate in a dynamic environment of interaction, which is mainly characterized by the collaborative building of knowledge from distance, in a real time (Anastasiades 2009). IVC is an important technological tool, which, under pedagogical and social conditions, can contribute, significantly, to the school opening to wider social and learning environments. Furthermore, it can encourage social negotiation and critical view of contemporary, local biographies of the microworld, surrounding the classroom, and it can also cultivate the spirit of cooperation, the necessity of empathy, and the culture of everyday consultation with other mentalities, attitudes, behaviors, and perceptions (Anastasiades et al. 2010).

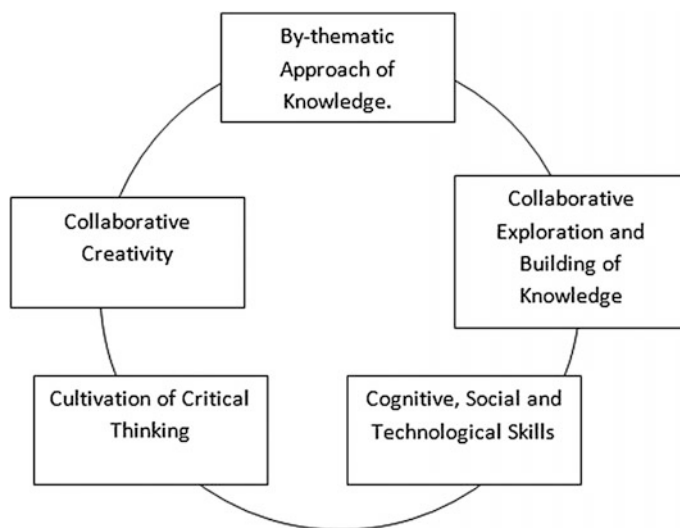


Fig. 2.3 Components of pedagogical approach of the ODYSSEUS Program

The pedagogical approach of the ODYSSEUS Program (Anastasiades 2003; Anastasiades et al. 2010) is based on the by-thematic approach of knowledge, which is explored and built collaboratively, aiming to: (a) cultivating crucial, cognitive, social, and technological skills, (b) highlighting critical thinking, (c) encouraging CC, in order to prepare the future citizens for their creative and critical inclusion in the emerging society of knowledge, in the twenty-first century (Fig. 2.3).

The “ODYSSEUS 2013” Program framework, in relation to the encouragement of CC, is based on three pillars:

1. “Democratic Endorsement” is adopted (NACCCE 1999), according to which creativity does not concern some gifted and talented people, but it refers to the creative aspects that each person has (Finke et al. 1992; Craft 2010; Xanthakou 1998; Koulaidis 2007; Weisberg 1993).
2. Creative aspects of students can emerge through realizing and unleashing their skills, while the role of the teacher is to contribute to the elimination of related barriers with the help of techniques and methods, in an understanding and trusting environment.
3. The theoretical framework of social constructivism is considered the most appropriate for the encouragement and promotion of CC (Mamykina et al. 2002), since a significant number of researchers believes that theories of social constructivism contribute, significantly, to enhancing the creativity of students (Csiksentmihalyi 1996; Plucker et al. 2004; Sawyer 2004; Craft 2005).

Based on the approach of the pedagogical use of videoconferencing (Anastasiades 2003, 2010) in combination with the revised taxonomy (Bloom, Anderson et al. 2001) and the use of web 2.0 applications (Anastasiades and Kotsidis 2013), four main stages are recommended (Fig. 2.4):

During the “Odysseus 2012–13” program, from February to June, there were made a total of 16 videoconferences, involving almost 200 students from 8 primary schools in Athens, Crete, and Aegina. Students and their teachers took advantage of the IVC methodology (Anastasiades 2003, 2010). Furthermore, with the help of web 2.0 applications, they designed and implemented creative activities remotely (Picture 2.1a, b).

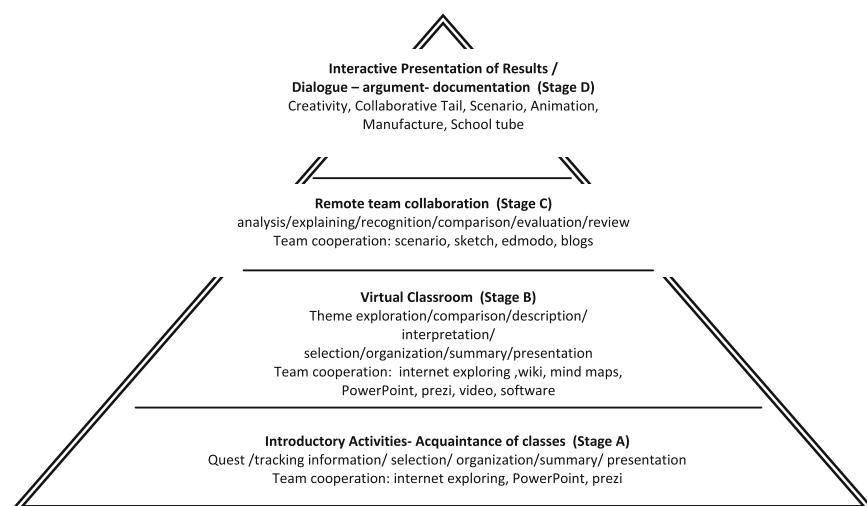
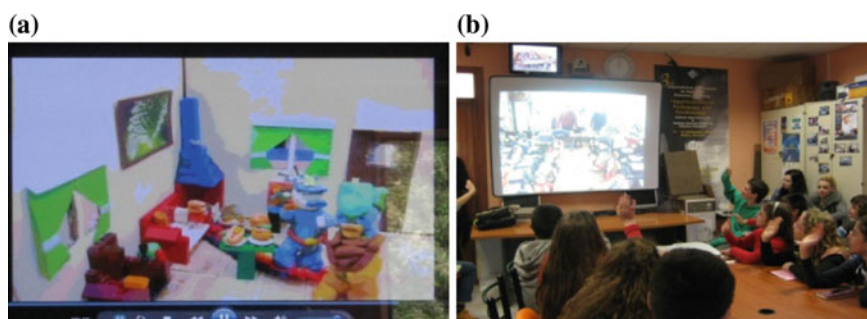


Fig. 2.4 The pyramid of IVC



Picture 2.1 a, b Snapshots from students’ creative activities by distance

Conclusions

In these times of uncertainty and rapid change at all levels, the educational system, the universities, and the educational policy designers owe to bear on their shoulders a historic weight: to regenerate, from its ashes, what, for years and systematically, they delegitimize: the creativity of students and teachers, which was degraded, in the name of positivist and mechanistic approach to serving the needs of industrial society and its structures.

Prerequisite for encouraging collaborative creativity is to redefine the pedagogical dimension of ICT in order to support teachers and students in building a new participatory culture. This will contribute to the necessary transition from the school of standardization, sterile rationality, error and uniformity “criminalization,” to environments, which will encourage originality and innovation, build collaborative knowledge with the use of alternative approaches based on the pedagogical use of the error. This paper argues that the pedagogical approach, within “ODYSSEUS” program, is a first step in this exciting journey.

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