Contents lists available at ScienceDirect

Thinking Skills and Creativity

THINKING SKILLS
AND CREATIVITY

Fostering creativity by a specially designed Doris tool

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ARTICLE INFO

ABSTRACT

The aim of this study is to shape, introduce and validate a brand-new tool to foster functional creativity of students, who represent a great source of fresh and applicable ideas for the efficient, prosperous and sustainable development.

The first step was to create a new tool under name Doris and test it in a pilot study on the group of 40 high-school students divided into experimental and control group. Encouraged by the results we conducted a core study in 5 EU countries on the group of more than 2000 participants in high-schools during the period of 3 years. We have used experimental method for our research, and then conducted a comparative analysis of the experimental and control groups.

The usage of the Doris tool showed that such an imaginative game could raise an interest for the expression of creativity in schools, could build self-confidence of the participants, and enhance creative ways of thinking. The participants were in the shoes of decision-making persons and allowed to express their own ideas how to make the world a better place. It is an encouraging fact that the majority of the generated ideas were the result of imagination and focused on radical innovation or new fields of implementation of the existing technologies, and the minority were ideas for innovation efficiency of existing product/services.

The implementation of some of these ideas in real life has proven that the Doris tool can be used in schools to foster creative thinking and generate fresh applicable ideas.

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1. Introduction

1.1. Knowledge and creativity

A typical system of education is based on memorising: learn, remember and repeat. "Most of a child's time at school is devoted to the acquisition, retention and testing of knowledge. Children learn methods and facts and are then tested on how well they can apply those methods and remember those facts" (Sloane, 2006, 45). Since many facts about the world and processes around us are complementing the new insights due to new information inputs on daily basis, the knowledge acquired in school is more or less lagging behind the actual facts.

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Students in these conditions, "are fed" with a myriad of facts, a part of which is completely useless in modern conditions, and a good portion (the newer data) can be easily found on the Internet. The dilemma is whether it is still enough to learn a lot of facts, given that knowledge is continually updated and changed.

Knowledge is essential to everyone, even to the most intelligent people or the most creative individuals. One definition of intelligence is the ability to solve new tasks by using a combination of previously acquired knowledge in new ways. "Intelligence is best captured at the medium ranges of novelty, where the opportunity for people to make intelligent use of their previous knowledge is optimal" (Kaufmann, 2004, 157). However, when a new task cannot be solved by using the acquired knowledge i.e. "when the task contains so much novelty that 'the individual cannot find any relationship between the current situation and past experience', intelligence, by definition, is not applicable. In these situations, it takes creativity or 'a completely unique approach for their solution" (Gardner & Sternberg, 1994, 39).

"Creativity is often obvious in young children, but it may be harder to find in older children and adults because their creative potential has been suppressed by a society that encourages intellectual conformity" (Sternberg, 2003, 98). There is a widespread belief that school is 'suppressing' creativity: while the kids before entering school have unlimited imagination, later on they become more closed in expressing their fantasies. "In the process of an adolescent's development, at its most critical stage, there is usually a decline in school progress, a weakening of formerly established habits, particularly when productive work of a creative nature unfolds before the child. Adolescents may draw less because they are more aware of objective cultural standards and therefore more critical of their own work" (Sawyer, 2003, 70). So, to stimulate creativity of older children (adolescents) something has to be done.

1.2. Imagination and creativity

Einstein reported that he first 'saw' the solution to a problem without being able to express it (Ritter, Baaren & Dijksterhuis, 2012, 21). The general definition of imagination is: "Imagination is the ability to think of all things as possible" (Kangas, 2010, 2). The more comprehensive explanation sees "imagination as an aspect of reflective thinking that enables us to create ideas that not only go beyond what is given but are effective, in the sense that they are likely to transform experience as intended. The things most emphasised in imagination as it reshapes experience are things which are absent in reality. Imagination is an essential human capacity in various activities such as the pursuit of creativity and innovation, the symbolic expression of ideas, and critical thinking. In other words, imagination is the internal imagery of a creator whereas creativity and creations are the outward manifestation of imagination" (Liang, Hsu, & Chang, 2013, 110).

Imagination may help people to push the boundaries of current knowledge, to exceed the limitations of generally accepted definitions of reality, and to enter an expanded scientific world and develop more elaborated scientific theories, thereby leading to technological advancements (e.g. new products) that surpass the inventions of the current generation (Wang, Ho, Wu & Cheng, 2014, 107). In this boundless, ever-changing globalization market, in which knowledge is the niche for competition and cooperation, creative knowledge has already become an index that leads civilization into a continuous advance (Shena, 2012, 616).

The biggest innovations during the human history, made out of nothing existing, are the result of fantasy and imagination. For instance, the laser had no ancestor to follow or improve it, nothing similar was seen before – the light gathered to cut the metal or stone! Without someone's fantasy we would not have plasma or LED TV hanged on the wall as a painting, the Internet or an iPhone.

Imagination makes it possible to get out of the closed circle of thought (out of the box). Imagination takes us into the future, to unimagined discoveries that make life more beautiful, better and more interesting. But it also allows individuals to rise above the average and generate fresh and useful ideas. In the present context of globalisation and the general competition, creativity (creation of new and applicable ideas) and innovation (profitable implementation of creativity) became a condition for survival. "Although imagination is common to everyone, there are individual differences in how individuals use imagination to generate good ideas that solve problems" (Ho, Wang, & Cheng, 2013, 76).

Albert Einstein said: "Knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution. It is, strictly speaking, a real factor in scientific research" (Einstein, 1931, 1085).

1.3. Games and creativity

In 1958, Albert Schreiber wrote an article in the Journal of the Academy of Management about "another new teaching technique" which was said to offer "attractive possibilities for improved learning experiences" (Schreiber, 1958, 57). "This new technique was the use of games" (Verzat, Byrne, & Fayolle, 2009, 359). In the literature, the nine-dot puzzle problem – frame of reference (Akin & Akin, 1998) and the Mutilated Checkerboard (MC) problem (Kaplan & Simon, 1990) are well known examples of games that require creativity to be solved.

One of the most popular games is Lego. When testing the technical schools in the north of France, "the use of Lego was found appealing to the students and provided an excellent medium for teaching design, programming skills, and creativity" (Verzat et al., 2009, 360). In other cases, which is investigating in the companies Nokia, Daimler–Chrysler, Ikea, and Alcatel, Kimberly Jaussi concluded that "legos work because they let executives visualize abstract concepts like 'value chain' or 'process engineering' by actually building their interpretations of them" (Sawyer, 2006, 297). "Different games can be used