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Creativity is the key to education

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Abstract

Creativity signifies and brings along novel, original and valuable outcomes for the individual or society and education at a glance. While the imaginative person is a dreamer, the creative person moves the world forward along with education. If we take the history of Education and analyse, then we come to conclude that, it faces many more challenges today than ever before in its history. In this paper the focus will be on teacher's creativity in teaching and also the leadership in student as well as teacher level, which are the main agents for changing the education system in the present scenario.

What are the key features of creative teachers' pedagogical practice and just how do teachers teach creatively and teach for creativity, thus fostering children's creative learning? Taking these concept the paper also analyse the questions which are putting forward and shown in a three-dimensional model, and a number of key features of creative practice are highlighted, where the difference between good teaching and creative teaching is examined, it focuses and finds some considerations on the creativity-brain-learning triad and defines the creative person; creative teacher and creative student also elaborate the term creative education. The North Axis principles, as a means to stimulate creativity, yield the content thereof. It highlights the importance of practical activities for the economy of education. The modality to learn with the students the secrets of the investment in the stock market, which he has discovered himself and called stock exchange simulation, presents examples of models and best practices in Teacher Professional Development (TPD) for ICT in Education.

Keywords: brainstorming, creativity, education, north axis, simulation

1. Introduction

Creativity implies more than simply involving imagination or fancy. It signifies and brings along novel, original and valuable outcomes for the individual or society. While the imaginative person is a dreamer, the creative person moves the world forward. To this effect, he needs to have a powerful background of information and education, a powerful basis of differentiated assessment systems, whereby the production of values should be possible and assessable. The preoccupation for creativity is based on brainstorming. The interest in creativity has extended over industry; business, education, research, science. Creativity benefits from extensive extra psychological supports: reconsideration of Occidental cultures of relaxation, medication techniques, recourse to archaic thinking with its dominant features; related to myth, archetype, image, lateral thinking; preoccupation for language and unconventional communication, based on analogy, metaphor, synecdoche. Now a day a new science emerged that is neuropedagogy; which emphasizes the asymmetry and complementariness of the cerebral hemispheres, the bioelectrical rhythms of the brain, the synaptic mediators and the lateralization dominance. The information are not equally managed by the two hemispheres: the left one is mostly verbal, logic, serial, sequential, semantic, it quenches the orientation reflex, it has two truth values and it operates in digital code. The right one is spatial, it deals with itineraries, locations, human figure and expression, being affective, it operates in analogical code, it is synthetic, and it makes remote associations and thinks most times laterally, divergently, metaphorically. Despite rehabilitated by neurologists, the right hemisphere and its reserves remain the great promise and challenge to fundamentally change the perspectives for the pedagogy of the future, which will probably turn much more towards image, motor skills, analogy, metaphor, intuition and sensitiveness. Here we are witnessing a return to archaic thinking powers and to an offensive of the image, on the verge of counterbalancing the domination of words.

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The brainstorming defers critical assessment, creates a relaxation state. A complete corpus of methods was organized for the purpose of neurolinguistic programming (PNL), with a view to unlocking part of the huge potential

of the brain; corpus whereby creative learning is becomes the dominant of this new millennium's pedagogy. The goal for creative education comes in different structures shown in figure-1 which should keep in mind while doing curriculum.



Fig 1: Goal of education

2. Creativity: Teacher and student

2.1 Creative Personality

It is extremely difficult to identify the personality of creative individuals. The creative person stands out by his/her enormous work capacity and mental minimization of the effort, patience associated to long-term interests. A great curiosity turned into the motor of all existence, a good control of emotions, the large energy consumptions of the creative process being obtained by focalization and redistribution in high tolerance to ambiguity.

The factors that stimulate the creative process are: creative climate composed of group and mentor, collateral passions, any kind of games, contradictory discussions with one's colleagues, ensuring the tranquillity necessary for meditation during the periods of creative trance. It is quite difficult to identify the personality characteristics of creative individuals, although some researchers have sought to list features including for example: curiosity, independence in judgement, thinking, intuition, idealism, risk taking and a capacity to become preoccupied with tasks (Torrance, 1965). In drawing conclusions from a number of studies, Stein (1974) again notes curiosity, independence, the capacity to become preoccupied, persistence and assertiveness, as well as domain expertise and unconventional tendencies.

2.2 Teacher's Creativity

Distinctions between creative teaching and teaching for creativity tend to highlight the teacher orientation of the former and the learner orientation of the latter. Creative teaching is usually seen to involve teachers in making learning more interesting and effective and using imaginative approaches in the classroom. Teaching for creativity by contrast is seen to involve teachers in identifying children's creative strengths and fostering their creativity. Research in educational contexts reveals that confidence, enthusiasm and commitment are common

qualities in creative teachers (Beetlestone 1998; Jones and Wyse, 2004; Grainger *et al.*, 2004) ^[7] and that a sense of the self as a creative being is an important aspect of this (Sternberg, 1997).

Teaching staff are among the professionals who oppose novelty with greater obstinacy than the specialists acting in other sectors of science. Innovation in education is easy to disseminate by cutting-edge means; yet is hard to assimilate. There is a first contact with novelty, which triggers interest and documentation. Its mental assessment follows then its application on a small scale thereafter its assimilation and integration finally; progressive contagion generates chain reactions, in the professional group members whereby the change generalizes. Didactics shows the normative character of its mandatory prescriptions; nevertheless it admits that the excess of normality paralyzes the teacher's liberty and creativity.

For the creative Teacher the vocation for innovation is fundamental. The teacher must be himself/herself passionate of the field, eager of novelty, keeping intact his/her curiosity and interest in everything that happens within his/her circle of influence. The senses inherent to knowledge are more important than knowledge itself as curiosity and hence the need to comprehend is specific to the child and human being. When they are not manifest, this does not mean they succumbed, only they were temporarily blocked by an excess of information, inadequately transmitted. More than he/she needs the teacher; the student needs to feel the model, the mentor; who teaches the knowledge worth assimilating for being truly relevant. The inciting-personal didactic style arouses the interest to the extent his/her own interest is vivid and unaltered.

The creative learning and Innovative Teaching structure is shown in below figure-2, shows Policy areas that need to be addressed in order to support creativity and innovation in teaching.

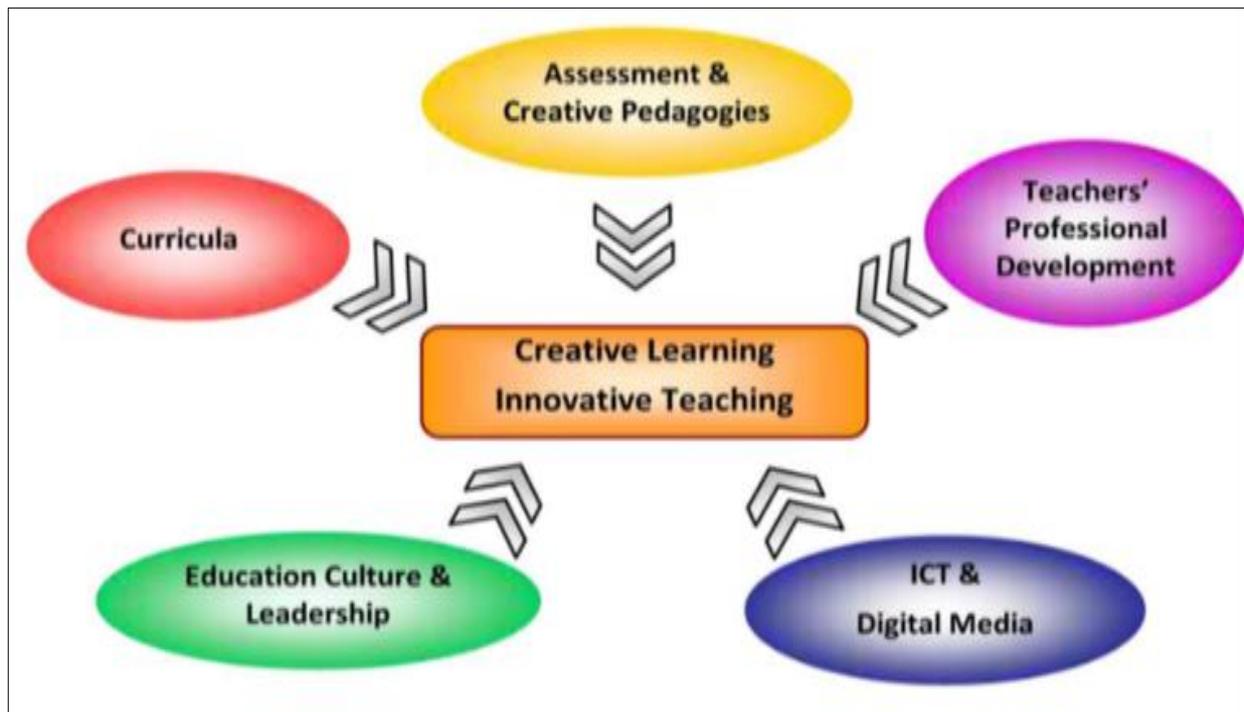


Fig 2: Policy areas that need to be addressed in order to support creativity and innovation in teaching

2.3 Students' creativity

The highly abstract knowledge started from extremely concrete problems. The human being's appetite for philosophy is fervently present from an early age as the significance, the relation of the parts to the whole, the harmony of the particular within the universal, the search for sense are more intense particularly in childhood, when the pressure of the unknown cannot counter balanced by extensive conceptual integration systems, hence anxiety, fear, dependence, yet the need to know. Modern school increasingly associates school creativity with pedagogy of the differences because, there is no standard pupil. He/she may manage the information primarily acoustically, visually or kinaesthetically; he/she may be a boy or a girl, right-handed or left-handed. He/she may evince psychic homogeneity, or strong asymmetry between cerebral hemispheres; between the sensorial and logical plans, between memory and reasoning or between types of thinking which is reproductive or creative, analytical synthetic, vertical-lateral etc.

The non-acceptance language proposing "Active Listening" which opposed to passive listening (silence), it implies the interaction with the pupil and offers him/her the proof of being understood by the teacher. The teachers who apply "Active Listening" note that it increases the profitable time to teaching and learning. Here's we deal how the Active Listening helps in creativity teaching and learning that is

- a. Active Listening helps pupils manage and sub side strong feelings.
- b. Active Listening helps pupils understand they need not fear their emotions.
- c. Active Listening helps pupils reach to the real problem.
- d. Active Listening facilitates problem solving by pupils.
- e. Active Listening places responsibility on pupils.
- f. Active Listening makes pupils more receptive to and willing to listen to their teachers.
- g. Active Listening promotes a closer, deeper relation between teacher and pupil.

3. Creativity methods

3.1. Instructive brainstorming

The student's idea discovery process was followed step by step and carefully manages his/her information, gradually increasing the complexity of the problem under consideration. The purpose is to develop solutions on various levels of creativity, respectively not to choose rash or global approaches. The gradual distribution of information prevents the participant's too rapid and premature focalization on a certain settlement path and therefore, their overlooking possible alternative solutions. It was guided step by step towards the actual problem, dividing the problem-solution process in several partial stages, rendering available ever newer and detailed information. After unveiling each new piece of information leads a new partial stage of brainstorming.

3.2. Six thoughts of hats

According to Noach, throughout the process of creativity which is based on the approach of the problem, the participants symbolically wear six hats of different colour. Each hat implies certain problem-settlement perspective. The hats may be changed with a view to exploiting their associated prospects and to approaching a problem from all points of view. The white hat represents analytical thinking, objectivity and neutrality. The one who wears it simply collects information, without assessing them. The red hat represents personal sensitivities and subjective opinion. All feelings are given free reign. The black hat represents all objective-rational arguments, including doubt, fears, and risks. There is not about feelings. The yellow hat represents objective-positive features, namely the chances and advantages, the hopes and goals. The green hat represents new ideas, creativity and alternatives, beyond what already is. The blue hat represents order, control and organisation, as well as perspective preservation and brings together the individual results obtained on a meta-position. In this way,

various viewpoints are registered consecutively and become known, achieving with an extension of the personal analysis perspectives.

3.3. North axis principles

The productivity of thought implies generating multiple ideas. In order to think productively, we need organize our thinking according to some principles, called *North axis*, which we will detail as follows:

- a. Defer judgment, when generating ideas,
 - b. Generate as many ideas as possible,
 - c. Put down the ideas as you produce them,
 - d. Elaborates new ideas or improves the older ones.
- a. When searching for ideas, by oneself or in group, it is important not to judge, not to evaluate, and not to criticize ideas as you generate them because nothing kills creativity more than critical thinking. There is characteristic of the human being to try to find solutions and to discover withal why the respective solutions are not valid. Thinking without value judgement is dynamic, flowing. In this way the ideas stem from each other each bringing along another and creating Fibonacci's series.
- b. The secret of deferring value judgement while re-generating ideas is to split thinking into two stages: possible thinking and practical thinking. The former implies random generation of ideas, without evaluation or judgement. It is important to generate as many ideas as possible, without assessing their value altogether. After having created as many ideas, pass to practical thinking, to evaluating and judging ideas in order to find the most important ones which are worth considering. Edison would guarantee productivity by imposing both for himself and for his assistants, a certain share of ideas. He undertook to make a minor invention every ten days, and a consequential one by every 6 months. We can act similarly, setting a quantitative level to observe. If you work by yourself, you might make it a duty to find 40 solutions; and if you work in group, you might make it a duty to find 120 solutions. Endeavouring to comply with the imposed share, you cancel your critic qualities and you put down everything that comes to your mind, both obvious and original ideas. One third of these ideas will be the old ones, known by everybody; another third will be interesting ideas; and the final third will be complex, original ideas.
- c. By focusing certain figure, we set out to make a list of ideas; it is worth nurturing the habit to make lists when searching for ideas, when making brainstorming. Lists will help us to organize our thoughts, streamline our thinking, maintain our focus and they will compel us to resort to alternative solutions. The lists of ideas also help us remember that the solutions we figured out. Psychologists proved that we can keep in mind a number of ideas ranging between five and nine. After 12 seconds, the capacity to remember diminishes, and after 20 seconds, the information completely disappears, unless put it down. Putting down ideas and making lists of ideas increase the speed of thought and the creativity. The lists of ideas are a simple method to enhance thinking skills.

- d. Enrich your own ideas and the others, by developing and analyzing them in detail and orderly manner. Subsequent to generating a manifold of ideas, develop, modify and combine them and create new thoughts. Develop our ideas, by resorting to the 9 principles of creative thinking, elaborated by A. Osborn and B. Eberle in SCAMPER.

- S Substitute. Can I substitute something?
 C Combine. Can I combine something with something else?
 A Adapt. Can I adapt something to my subject?
 M Modify. Can I multiply something?
 P Place. Can I place it in another context?
 E Eliminate. Can I eliminate something?
 R Reverse. Can I rearrange it?

3.4. Not to think up about the problem

Perfect knowledge in a field can be a barrier to creativity, as it canalizes thinking in a certain other way. If you want to create something, for instance a product, do not think about it. An abstract definition of the problem can be the key to creativity and innovation, better than a classical definition. One can start from abstract structures, which will be progressively transformed into less abstract representations until they come to stand for a real case. If you think about the problem, by turning it into an abstract situation, you have great chances to overcome the barriers of conventional solutions. Routine is the great enemy of the minds and it installs quite quickly therein. By rendering the problem more abstract, you avoid its analysis from the classical perspective, which takes hold of your mind. The various Stages to follow are:

- a. Give an abstract definition to the problem
- b. Search for ideas through the method of brainstorming
- c. Redefine the problem more abstractly, and then search for as many solutions
- d. Analyze the real problem. Review the ideas and solutions of the two abstract problems and use them for generating solutions.

Graham Bell started to think about the invention of the telephone, after having read a presentation in German of an invention which as Bell thought had the functions of a telephone. After having invented the telephone, Bell found out he had misunderstood the explanations, as the German invention had quite another utility. Likewise, the ideas and solutions of abstract problems can represent the necessary stimuli for overcoming the barriers of the mind in creativity. The more ideas we put down and review, the more complex becomes the information network available for our brain. Imagine our ideas as atoms clinging to our brain. When we think about something, these ideas are set in motion in the unconsciousness. The more intense we think of a problem, the more information we send to the long-term memory and the more thoughts we set in motion. Unconsciousness never rests. When we decide to give up an idea, when we abandon it, the unconsciousness does not stop working. The idea freely moves therein, combining and recombining thousands of times. Most combinations are of no value, yet there is a certain combination valued by unconsciousness and sent to consciousness as an *idea out of the blue*.

4. Stock exchange simulation

Good ideas are not born from nowhere in a vacuum; they occur every time in a diversified frame of connections and in a complex intertwining of relations. The looming out of ideas is not enough. The participants in the overall process, both teacher and students, need be convinced of the ideas under consideration, so that their implementation might be launched and the afferent resources, granted.

Here it was highlighted a modality to learn with the students the secrets of the investment in the stock market, which he has discovered himself and called it as *stock exchange simulation*. In order to learn to swim, you must know the moves and therewith jump into the water and swim. This principle was applied with the students, also in the case of the stock exchange simulation. Practically, teams of 3 students are formed, and each team has 100000 virtual lei, which they invest by buying shares at the 1st and 2nd category of the Stock Exchange of Bucharest. As a group is composed of 24 students, 8 teams are thereby formed, which compete with each other, with a view to obtaining higher profit on the stock market. After 7 weeks, the teams sell the shares; and those who obtain higher profits win. Thus, the winning team members receive 2 points at the examination; the members of the team ranked second receive one point. Collaboration (which is said to be more important than competition) is thereby enhanced, within the teams consisting of 3 students each. Practically, how do we act? In the 4th week of the semester (after going through the courses: Defining Elements of the Capital Market, Quotation of the Stock Exchange and Fundamental Analysis, which aim at initiating students into the Stock Exchange) during seminar, in front of the computers, the students fill in a table that comprises: No. Denomination JSC Symbol Regular average price Quantity Value, If we multiply the regular average price with the quantity, we obtain the value, namely the amount of lei invested by students in the company X. It was further mentioned that the average price refers to the price of the shares purchased by students. If the students, at the rubric *quantity* do not take an integer number, they are disqualified. Likewise, they are allowed to exceed 100000 lei not even by one ban. The total invested amount must get as close as possible to 100000 lei. For instance, 99999, 98 lei were invested. After 7 weeks, the table shall be filled in again, only the regular average price and implicitly value having modified. This time, the average price will be the selling price for the shares previously bought.

4.1 Teacher education and professional development

Teacher training programmes should provide all prospective teachers with guided development of classroom teaching practice as part of their initial training. Hands-on experience with guidance becomes crucial to prepare new teachers facing the reality of the classroom and to develop innovative and creative teaching methods. New guidelines for creative learning and innovative teaching in teacher training should develop. ITT programmes should cover a variety of learning-centred pedagogies and assessment approaches, in particular creativity and innovation as cross-curricular competences, as well as embedding digital competence and tools in all learning.

Information about relevant online networks and collaboration opportunities, like Twinning, should be highlighted and incorporated as part of teacher training,

which help teachers to participate and learn informally from their peers. Training opportunities should be provided to allow teachers to be mobile within and across countries and to have more exchanges between teachers of different nationalities about innovative learning practices. Funding should be targeted at specific teacher training needs in different teacher groups. CPD courses should be provided free of charge for teachers of all ages to engage in lifelong learning and updating skills which are crucial for creative learning and innovative teaching. CPD should be defined as part of teachers' work tasks with time allocated for courses, and participation should be systematically supported and incentivised.

Both personal and pedagogic digital competence need to become a priority in both ITT and CPD, because lack of ICT skills and understanding of its measure benefits is a major obstacle for many teachers. Modular training is needed for rapid technological development. Teachers should be able to teach their students to become digitally competent and also guide them towards more exploratory interaction with ICT, in which students can express their creativity and innovation with technologies

4.2 ICT and digital media

More research and data gathering is needed in order to assess the status and level of technology use by teachers. For developing educational strategies, it is important to study whether technologies and tools are used effectively for creative learning and innovative teaching and what the barriers are. Authorities responsible for technology investment should establish a system to regularly review technology maintenance and internet connections. Lack of technical support has also been recognized as a major barrier for efficient ICT use for learning and teaching. Teachers across the spectrum should receive more support in integrating technology into their teaching in creative and innovative ways. Technologies could be used to support interaction between teachers, pupils and parents. Online platforms could provide parents access to pupils' learning materials and tasks, which would help to understand new learning approaches and support their children at home with their schoolwork. At the same time, this would reduce parents' need for traditional grades as a means of knowing how their children are progressing at school.

5. Conclusions

Group creativity has a diversified contribution of synergetic effects: stimulation of the learning processes, higher and better targeted student motivation, enhanced stimulation and acceptance of the university culture, higher attention and preoccupation for students. The principle that a gram of practice is worth tones of theory, therefore, during the examination, the percentage of the practical subjects is 60%. It was said activity should refer not only to the actual teaching of the content, but also to its application. The content covers data, information and the actual subject. The application is about transformation and maturity. In other words, the content is the theory, and the application is the practical activity. The content generally refers to what is being discussed during class and the application mostly to what is being applied from the learnt content. The former concentrates on *knowledge*, the latter on *to be* and *to do*. The teacher main preoccupation is not the content, but its practical application, is in general life. The difference

between teaching in the light of the content and teaching in the light of application is amazing. The teacher who relies on content thinks his/her responsibility is to go through the course and to explain it. The teacher who relies on application nurtures the belief he/she is responsible with highlighting the relevance of the submitted data, with a view to determining positive changes in the students' life. At least 50% of the taught lessons should focus on application. When teaching a lesson, what really matters is not only the content, but also the sincerity and conviction of its transmission, as well as the possibility of its application. Often, the way in which we express ourselves bears more persuasiveness than words themselves.

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