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El clima creativo como medio para promover la creatividad en el aula

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Resumen

El concepto de la creatividad ha sido en la atención de los investigadores desde 1950. Estas teorías primordialmente se centran en las características individuales y personales de la creatividad. Aunque en las últimas décadas este tipo del enfoque de creatividad se ha ampliado y hoy en día encontramos varias teorías lo que enfatizan la importancia de los factores ambientales. Estos resultados del estudios marcan que las cualidades individuales no pueden ser evolucionados sin un ambiente de apoyo y los factores ambientales se pueden movilizar y desarroyar las habilidades creativas personales. Este artículo ofrece una revisión de la literatura profesional internacional de la aproximación ambiental nueva de aumentado creatividad con especial énfasis en las organizativas investigaciones anteriores de psicológicos y su capacidad de adaptación en el contexto escolar. El concepto de ‘ ambiente creativa’ también se introduce: su base teórica, una visión de conjunto de las técnicas de medición y sus relaciones de la motivación en el aula. Finalmente, algunas preguntas de investigación futuras y las cuestiones prácticas educativas se plantean.

Palabras Clave: creatividad, ambiente, ambiente creativa, aplicabilidad en el aula

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Creative climate as a means to promote creativity in the classroom

Abstract

The concept of creativity has been the subject of much research since the 1950s. These theories mainly focus on the individual, personal characteristics of creativity. However, in the past few decades this person-centered spectrum of creativity has been broadened, and today we encounter several theories that emphasize the importance of environmental factors. These research results underline the fact that individual qualities cannot evolve without a supportive environment, and environmental factors may mobilize and even develop personal creative skills. This paper provides a survey of the international professional literature of the new, environmental approach to enhancing creativity, with a special emphasis on previous organizational psychological findings and their adaptability in a school context. The concept of 'creative climate' is also introduced: its theoretical background, an overview of measurement techniques and its relationship with classroom motivation is presented. Finally some future research questions and educational practical issues are addressed.

Keywords: creativity, environment, creative climate, classroom applicability

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Introduction

Creativity research has had a long tradition since Guilford's (1950) pioneering lecture in which he distinguished convergent and divergent types of thinking. He stated that it is divergent thinking, idea-generation and the exploration of many possible solutions that can be directly linked to creativity, but convergent thinking and a focus on coming up with a single answer and with the best solution are also necessary for the creative process. Creativity is a process in which the elements of mind consolidate in a completely new manner and something original comes into existence, a form of behaviour in which a person resists routine answers, tolerates, and even seeks out the ambivalence, insecurity and vagueness that may serve as a basis for a new order (Gyarmathy, 2011). It is the process of having original ideas that have value, and involves putting one's imagination to work and making something new (Robinson, 2009). According to these definitions the creative process cannot be only conceptualised in the field of arts or advertising, but also in the field of any science or even in the vocational area. With the toleration of ambiguity, creativity gives way to new ideas, stimulates the acceptance of others' viewpoints, and thus raises tolerance, understanding and cooperation. In addition to more effective problem-solving and collaboration, creativity influences the quality of life in a positive way: creative people are more optimistic and persistent in problem-solving, the manifestation of everyday creativity contributes to the subjective well-being of the person and his/her environment (Barkóczy, 2012).

The concept of creativity has inspired much research and theories focusing on different aspects of creativity: for example, the creative personality (eg. Sternberg, 1985; Torrance, 1990; Tóth, Király, 2006), the creative process (eg. Parnes, 1981; Wallas, 1926), or developmental techniques and methods (eg. Osborn, 1953; de Bono, 2007). Models of giftedness also emphasize the importance of creative skills in talented individuals (Renzulli, 2005; Sternberg, 2005). These approaches have one thing in common: they all focus on the individual, *intrapersonal* aspects, the internal determinants of creativity. In the last few years, however, the environmental determinants of classroom processes have moved more and more into the centre of educational theory and research (Berry, 2002; Fernandez et al., 2012; Józsa, Fejes, 2010; Mohammed, Kanpolat, 2010; Ruiz et al., 2011) emphasizing interpersonal and other environmental factors in students' school achievement. This paper, in accordance with this direction, makes an effort to review the environmental determinants of the creative process with the presentation of the latest relevant research literature. My review aims to

introduce various new theories concerning the environmental factors of creativity, with a special focus on the school climate that facilitates creative thinking. First I present some theories with a special emphasis on the concept, importance and assessment techniques of the creative climate, following this, the concept of creative climate will be placed in an educational context: how it can be applied in the classroom and how it influences school motivation. Finally some open questions and research opportunities will be outlined.

Environmental determinants of creativity

Several complex models have already been generated with the focus on interpersonal factors and the environmental determinants of creativity. Rhodes (1961) was one of the first theorists to have a holistic perspective of creativity and developed the system of the 4P's of creativity: Person, concerning the characteristics of the creative individual, Process, referring to the process of problem-solving and the operational phases, Product, the originality of the outcomes of the creative work, and Press, including the qualities of the environment. In later studies Persuasion (Simonton, 1988) and Potential (Runco, 2007) were also added to the original 4P model, as a fifth and sixth element.

Treffinger's (1988) COCO model proposes that creative productivity is the function of the dynamic interaction of four factors: the personal Characteristics of people, the Operations they perform, such as problem-solving and decision-making strategies and techniques, the given Context with its cultural and climate factors, the characteristics of the physical environment and situational factors, communication and cooperation, and the final Outcomes, products and ideas.

Csíkszentmihályi's (1996) systems perspective on creativity involves the interaction of three elements: the *domain*, which is the set of symbolic rules and procedures impregnated in the culture and knowledge of mankind, the *field*, or disciplinary experts who decide whether or not a product, idea, or work should be admitted to the domain, and the *individual*, with his/her special skills and personality. For creativity to occur, a set of rules and practices must be transmitted from the domain to the individual, then the individual must produce a novel variation in the content of the domain, and finally, the variation must be selected by the field for inclusion in the domain (Csíkszentmihályi, 1999). In this sense he radically broadens the concept of creativity, acknowledging the importance of a broader social context.

Like Renzulli, Amabile (1996), too, offers a three-ring model, with a specific focus on the antecedents of creative performance. For a creative idea or product to be generated, an individual must approach a problem with the appropriate domain-relevant knowledge, creative thinking and working skills (willingness to take risks, experiment, changes of perspective etc.) and task motivation. The coming together of these three factors is called the "creative intersection." Amabile particularly emphasizes the role of motivation, as it is the factor that actually determines whether or not a person mobilizes his/her domain-specific knowledge and creative skills.

Coleman and Deutsch (2006) summarize seven guidelines for fostering creative conflict-resolution or problem-solving, which also underlie the importance of optimal environmental conditions. These principles are the following:

1. *Challenge the common myths that block creativity!* According to Treffinger, Isaksen and Dorval (1994), many ideas about creativity have developed in people's minds that influence the procedure of problem-solving in a negative way. It is a myth for example that creativity is a rare, inborn talent that is too mysterious to be learnt, cannot be controlled, is a kind of insanity and appears only in artistic fields, or has something to do with extraordinary or foolish forms of behaviour. These thoughts may block the discovery of our own creativity. We agree with Ken Robinson (2011) who states that every person possesses a huge creative potential, simply by virtue of being human.
2. *Create a time-space oasis for creativity!* According to John Cleese (1991) the most important factor is to provide an appropriate physical environment and enough time to become absorbed in a task, then work persistently on the solution, this is called a time-space oasis, a necessary condition for creative production.
3. *Formulate a serious but playful atmosphere!* Humour and playfulness decrease anxiety and thus make us more open to new approaches.
4. *Create an optimal tension for problem-solving!* Tension motivates us to find solutions for a problem and in this way to decrease the tension deriving from the problem itself. So, while on the one hand, some tension is needed for motivation, on the other hand, too much tension may narrow our field of vision, so an optimal rate of tension is the best for creative solutions.
5. *Foster people's self-confidence to bear the risk of unusual behavior!* Some self-confidence or assertivity is indispensable if we want to come up with new ideas, so self-

reliance should be enhanced to encourage people to be more willing to take risks and consider novel ideas.

6. *Create the balance between divergent and convergent thinking!* The first step in the creative process, to find as many original solutions and new ideas as possible - the brainstorming-period - can be directly linked to divergent thinking, but decision-making, evaluation and the selection of ideas require convergent thinking. Open thinking generates a variety of options, but closed thinking tries to narrow the field of options. This means that for creative problem-solving both thinking types are necessary, but in different phases of the process. As these ways of thinking require completely different working-methods, it is worth separating the two in the working process.

Empirical research into the environmental determinants of creativity mostly explore the importance of family background and climate, parenting style, models and ideals, games and opportunities in childhood (Amabile, 1983; Walberg, 1988). The descriptions of a creative school environment emphasize the presence of real-life problems, rich stimuli, open tasks, group activities, the use of games, digital devices in the classroom, debates, project-work, cooperation and appropriate peer-relations. (Báthory, 2000; Vass, 2012).

Theories focusing on the environmental determinants of creativity do not question the significance of individual and personal characteristics, but focus on the catalyst-function of the surroundings: these research results underline the fact that individual qualities cannot evolve without a supportive environment, and environmental factors may mobilize and even develop personal creative skills (Mathisen, Einarsen, 2004). Environmental theories has the basic assumption that instead of socially recognized products and the product-oriented view of creativity the creative potential should be rather acknowledged and promoted and be the top priority in studies of creativity (Runco, 2010).

Creative climate as an environmental determinant of creativity

Creative climate research aims to identify and measure the relative degree to which an organizational environment is conducive to innovation and creativity, which may serve as a basis for later efforts to improve it. These factors were systematically investigated and explored in the business and organizational context in relation to the creative processes of employees (Amabile, 1996; Ekvall, 1999; Gruber, 1988). There are, however, more and more

investigational efforts in the educational context, as well (Ferrari, Cachia, Punie, 2009; Lucas, Claxton Spencer, 2012). Contemporary organizations are facing increasing socio-economic changes and rapid developments in technology, so continuous renewal and adaptation is required to keep up with these changes. In this sense creativity is a key to success, because in this continuously changing environment the skills required for renewal and adaptation are not a luxury but a necessity (Robinson, 2011). As Lubart and Zenasni (2010) state, “the financial crisis of the early 21st century (2008-2009) has brought into focus the evolving nature of the global economy, and the increasing need for creativity and innovation in all sectors to stimulate growth by providing new opportunities, and opening new sectors of activity” (p. 56). This aspect becomes more important in the educational field, as well as in organizations involved with developing skills in adults.

It was the Swedish Göran Ekvall (1983) who first realized the decisive role of creative climate in organizations. He defined organizational climate as a conglomerate of attitudes feelings and behaviors which influence organizational processes, such as problem-solving, decision-making, communication, control, learning, motivation and commitment as an intervening variable. These processes also have an effect on productivity, quality, satisfaction and well-being (Mathisen, Einarsen, 2004). Puccio and Cabra (2010) offer a systems model for organizational creativity, in which they state that “innovation comes about as the result of the interaction among people, the processes they engage in, and the environment in which they work” (p. 149). The social environment of a creative organization can be characterized by freedom and autonomy regarding the choice of tasks, encouragement of ideas, a non-threatening environment, sufficient time to create ideas, clearly specified objectives, a shared concern with excellence, permission to take risks, the opportunity to make errors, appropriate feedback and recognition, expectation, and approval of, and support for attempts to introduce new ideas. These factors seem to play a decisive role in the creative school climate, too.

Measures of creative climate

During the development of diagnostic tools for creative climate, investigations have suggested that organizational creativity is related to four broad areas (Ekvall et al., 1983):

1. Mutual trust and confidence, support for ideas, open relationships.
2. Challenge and motivation, commitment to the organization's goals and operations.
3. Freedom to seek information and show initiative.

4. Pluralism in views, knowledge and experience, exchange of opinions and ideas.

To explore these fields Ekvall (1996) produced a 50-item questionnaire called the *Creative Climate Questionnaire*. After the necessary statistical and factor-analytical studies 10 subscales evolved referring to the supportive factors of the creative climate of an organization. These are: *Challenge* (the degree to which the people in the organization are emotionally involved in its operations and goals and find pleasure and meaningfulness in their job); *Freedom* (the independence of behaviour, the autonomy to define work); *Idea Support* (the way new ideas are treated, and ideas and suggestions are received by managers and colleagues in an attentive and receptive way; there are possibilities to try out new ideas); *Trust/Openness* (the degree of perceived emotional safety in relationships, a strong level of trust; everyone dares to present ideas and opinions since initiatives can be taken without fear of ridicule in the case of failure); *Dynamism/liveliness* (new things happen all the time; there are frequent changes in ways of thinking about and handling issues); *Playfulness/Humour* (the perceived ease and spontaneity of the social environment, a relaxed atmosphere with laughter and jokes); *Debate* (encounters, exchanges or clashes between ideas, viewpoints and differing experiences and knowledge); *Risk-Taking* (the tolerance of uncertainty in the organization, decisions and actions are rapid, arising opportunities are seized upon, and concrete experimentation is preferred to detailed investigation and analysis); *Idea Time* (the amount of time one can use for developing new ideas, possibilities to discuss and test impulses and suggestions that are not planned or included in the task assignment); *Conflicts* (the degree of emotional and personal tensions in the organization, when groups and individuals dislike each other, there is considerable gossip and slander – a negative factor). The Swedish questionnaire was later translated into English and slightly revised (Isaksen et al., 1999): the scale Dynamism/liveliness has been removed, and this new version has been named the *Situational Outlook Questionnaire* (SOQ).

In the past 10-20 years a large number of investigations used this questionnaire (a) to validate it (Isaksen, Lauer, 2001; Isaksen, 2007), (b) to explore the climate dimensions of individual organizations (Isaksen, Lauer, 2002), (c) to explore its correspondence with other related issues (Isaksen, 2009; Isaksen, Ekvall, 2010; Isaksen, Isaksen, 2010) or (d) to describe national or cultural differences in climates (Ekvall, 1996; Mohamed, Richards, 1996). In an interesting piece of research Ekvall and Ryhammar (1999) asked 130 teachers at a Swedish

university about the climate of their organization and the actual level of creativity, and they found a definite relationship between these factors.

The main dimensions of SOQ can be identified at school and can be interpreted with respect to school-work, learning and problem-solving too, although Richards (2002) shows that some other aspects of climate are also relevant in the school context. Some degree of uncertainty about the psychometric properties of the questionnaire limits the use of this questionnaire to assess creative climate at school (Mathisen, Einarsen, 2004).

Some other instruments have also been developed to measure creative climate. Amabile and her colleagues (1996) assessed the work environment for creativity with the KEYS questionnaire which focuses on individual work environment perceptions. This instrument consists of 78 items with four-point response scales. The results of KEYS give a thorough evaluation of employees' perceptions of creative climate and enable advice to be given for further organizational improvements. The ten subscales include six stimulant scales (organizational encouragement, supervisory encouragement, work group supports, sufficient resources, challenging work and freedom), two obstacle scales (organizational impediments, workload pressure) and two criterion scales (creativity, productivity). As it was developed specially for work organizational environments, this questionnaire is not fully relevant in the school context.

The Siegel Scale of Support for Innovation (SSSI) assesses organizational climate factors that are present in innovative organizations, through individual climate perceptions (Siegel, Kaemmerer, 1978). The 61-item questionnaire with 6-point ranging Likert-scales, considerably ahead of its time, measured several important dimensions that also seem to be relevant at school. It contains five main factors, namely Leadership (the role of leaders in an innovative organization), Ownership (commitment of employees), Norms for diversity (positive attitude toward diversity, individual autonomy), Continuous development and Consistency (between processes and desired products). Its major problem is that only very limited documentation exists about its psychometric characteristics (Mathisen, Einarsen, 2004), but it is still worth regarding its dimensions as possible determinants of a creative classroom climate.

The TCI (Team Climate Inventory) measures the work group climate for innovation, and was designed primarily as a team development tool for facilitating creativity (Anderson, West, 1998). The original 61-item questionnaire was later revised and converted into a shorter, 38-item form, and today an even shorter, 14-item version is also available in Finnish (Kivimäki, Elovainio, 1999). It contains four major dimensions including some more subscales. The Vision dimension refers to the extent to which the team's objectives are clearly defined and valued, including the subscales of clarity, visionary nature, attainability and sharedness. Participative safety refers to the extent to which the environment is perceived as interpersonally non-threatening, and where it is safe to present new ideas, and is divided into the subscales of information sharing, safety, influence and interaction frequency. The Task orientation dimension indicates the shared concern of excellence in task performance, with excellence, appraisal and ideation sub-dimensions. Finally, Support for innovation is about the degree of the expectation of, approval of and practical support for introducing new ideas, with the subscales of articulated and enacted support. Its psychometric structure is well-established (Mathisen, Einarsen, 2004) and measures creative climate in working teams in an appropriate way, but because of its firm organizational basics it is less useful in the educational setting.

It is worth mentioning the work of Ferrari, Cachia and Punie (2009), whose thorough study interprets environmental determinants directly in a school context. They list all those factors that may foster creativity in the classroom. Creativity enablers are divided into eight major areas: Assessment, Culture, Curriculum, Individual skills, Teaching and learning format, Teachers, Technology and Tools. All these areas are divided into several elements which form a very detailed checklist related to enablers. It is not a questionnaire but rather a self-monitoring checklist about the critical points of the creative environment, which include not only climate factors but other educational, methodological and environmental factors, as well as individual characteristics. It is extremely beneficial for teaching practice, but because of the lack for systematic evaluation and scoring, it cannot be used for research.

The foregoing has highlighted the fact that it seems to be necessary to develop a tool to assess creative climate at school, which can be useful from the researchers', as well as from the practitioners' point of view. The Department of Educational Psychology, University of Debrecen, Hungary has already started this work with the systematic exploration of the background factors of creative climate.

Creative climate at school

Although there is a significant amount of literature pertaining to creative climate in organizations, similar information is lacking in the educational sector. However, Ekvall (1999) himself emphasizes that there is a growing need and demand for creativity and alternative methods of instruction in the classroom. Today's education should prepare children for a future that we do not know, so "the only way to prepare for the future is to make the most out of ourselves on the assumption that doing so will make us as flexible and productive as possible" (Robinson, 2009, p. 20). With creativity one can become more agentic in bringing the desired state into being, and future becomes rather an opportunity, than a threat (Moran, 2010). In this sense creativity can be a key to future education. Today most Hungarian schools usually evaluate hard-working, adaptive, well-behaved students, but not creative or nonconformist ones, who often disturb classroom processes; and most workplaces do not require creativity, which means that someone with creative skills can only live through these skills in leisure activities, not at work (Barkóczy, 2012).

According to Treffinger, Isaksen and Dorval (1996, cit. Argona, 2001) organizational climate characteristics are closely connected with problem-solving and learning styles, which also justifies their application in the classroom. Some classroom behaviours are identified by Fleith (2000) which enhance creativity and are in line with the Ekvall dimensions: allowing time for ideas and creative thinking (idea-time), rewarding creative ideas and products (challenge), encouraging sensible risks (risk-taking), allowing mistakes, imagining other viewpoints or questioning assumptions (debate), exploring the environment, finding interest and problems, generating multiple hypotheses, focusing on broad ideas rather than specific facts and thinking about the thinking processes.

In spite of its relevance in an educational context, there is only a limited amount of research with respect to classroom issues of creative climate. In recent studies the focus was primarily on the identification of behaviours and activities that are indicative of creative climate in the classroom and on the Ekvall dimensions which serve as a starting point for educators to establish conditions for creativity. Some projects by the students of Buffalo State College, International Center for Studies in Creativity (Argona, 2001; Aurigema, 2001; Richards, 2002) focus on finding Ekvall's dimension in the educational environment,

especially in gifted education. In their work climate dimensions are not measured by questionnaires, but rather by qualitative measures such as classroom observation or interviews with students and teachers. One of their major purposes is to establish a standardized observation protocol in the form of a checklist (CLASS, Creative Climate Checklist About School Settings) that can serve as a basis for further comparative research.

In a study Jesberger (2001) identifies and documents the creative climate dimensions in an enrichment programme classroom setting. Richards (2002) also identifies these dimensions in kindergartens and elementary schools, and points out that almost all the teachers she observed have met the concept of ‘creative climate’ and consciously try to build its principles into classroom processes. In addition, she identified various factors that seem to be relevant in building up creative climate in an educational context. Social *Acceptance* is something necessary in order to have trust in, and openness towards others. A student, who is not accepted, cannot focus on academic developments, and only being accepted by the teacher results in the child becoming a ‘teacher’s pet’, which also inhibits outstanding performance. The *Leadership* dimension refers in to the role a class of a social leader, who often initiates activities for others to follow his/her behaviour. *Camaraderie* is the dimension describing the sense that everyone has his/her specific task in the learning process. Being together, sharing ideas, sharing in success or joining together to plan something are examples of this factor. *Ownership*, as the last additional factor is about the feeling students have that they are contributing to classroom processes. According to Richards (2002) students enjoy feeling that something they made was used by the teacher, or that they can participate actively in the learning process. A Lithuanian study (Klimovienė et al, 2010) examines the climate perception of university students with the use of a 20-item questionnaire measuring the same creative climate dimensions as Ekvall, and finds a relationship between climate factors and the advancement of foreign language acquisition.

All these studies show that findings of creative climate research in an organizational setting can be implemented in the educational context only to a certain extent, as school norms, classroom processes and children’s groups have their own, special characteristics.

Creative climate and motivation

Hennessey (2004) stresses the motivational potential of creative activities, with a special relevance to gifted education. On the basis of Amabile's "creative intersection model" (1996) she states that in the identification of giftedness domain-relevant knowledge and creativity skills are examined most of the time, because they are fairly stable. However, it is task motivation that really makes the difference between what an individual can do and what s/he will do, and determines whether domain skills and creativity skills are adequately and efficiently used in the service of creative performance. This means that students' advanced intellectual capacities and problem-solving skills will often not be enough to ensure that creativity will flourish in the classroom, it is also important to consider students' motivation as both a relatively enduring trait and as a temporary situation-specific state.

Csikszentmihályi, Rathunde and Whalen (1996) stresses the teachers' role in the formation and maintenance of intrinsic motivation for learning, because gifted students often feel disappointed and bored in a tiresome, uninteresting class. Gifted students generally have the experience of being involved in something and have intrinsic motivation, so the lack of this will result in a frustrated, disillusioned or even cynical state of mind. The solution is to develop a "flow" experience, to harmonize a person's perceived skills and the challenge of a task.

Baloche (2005) explores the relation between cooperative learning contexts and creativity and describes those social factors that influence intrinsic motivation and encourage creative engagement. These are the following:

1. *Cooperative context:* Cooperative learning context enables students to use contextual, indirect information for learning. Students who work in a cooperative climate are more likely to choose more challenging projects, they are better problem-solvers in problems requiring divergent thinking paths, and are more satisfied with their work.
2. *Psychological safety:* According to the Maslow-pyramid, psychological safety is essential for creativity and mental health. The literature of cooperative learning (Baloche, 1998; Johnson, Johnson and Holubec, 1992) offers evidence that cooperative learning provides this safety, develops social skills and enhances prosocial values.

3. *Perceptions of equity*: Merely using group work and cooperation is not always enough for increasing motivation, as it does not allow for equal participation for each student. Less able students tend to talk less, be ignored by others and may be passive in a task. True cooperation requires equal participation and the establishment of a context for equity. Simultaneous interactive techniques or student-to-student talks ensure that all students' ideas will be considered by the group.
4. *Complex learning opportunities*: To encourage creative engagement and intrinsic motivation students should be provided with learning tasks that do not have one prescribed path to solve, that require divergent responses and associative thinking.
5. *Student-centred choices*: Students should be allowed to make meaningful choices and decisions. These can be provided by not giving sample products for solutions, giving space for student-generated ideas, and providing ample space and time for elaborating ideas.
6. *Interpersonal and small-group learning skills*: Students should acquire skills necessary for cooperative and small group learning and complex activities with multiple paths to a solution. Students socialized to "give the right answer" should be taught to ask for information and suggestions, help to organize materials, paraphrase others, make a plan or think out loud.
7. *Use of conflict and controversy in learning*: Teachers must be prepared for, and even foster controversy. Conflict situations are uncomfortable for most teachers, who, as a result, try to stop them with authoritative methods such as restricting student talk. However, research on group dynamics has demonstrated for a long time that "storming" is a necessary stage in group development (Tuckman, 1965), when the group is characterized by tension and a competition of ideas, and differences and conflicts may emerge. This is the stage before the norming and performing stage, so instead of forbidding conflict and academic controversy, they should rather be encouraged in the learning process. Perspective-taking practice and the ability to view issues from multiple perspectives is essential to creative thinking and problem solving
8. *Student expectations for feedback, evaluation and reward*: Feedback for students should be more complex than a simple "reward-punishment" based reward system. In the case of complex thinking and creativity we should have students reflect on their own work, avoid personal praise, but provide a task-oriented, specific feedback, and use group reflection carefully. Feedback that fosters creativity should be positive and specific, and focus on the

pleasure of learning, but students should be given time for unevaluated work, too, as the expectation of a reward has the potential to lower creativity and enthusiasm for the future.

According to the above mentioned cooperative principles Baloché (2005) articulates some suggestions for increasing intrinsic motivation through the establishment of a cooperative and creative environment. For example, teachers should use the “conditional language”, the language of possibilities, perspectives and processes, adults should model passionate interest and cooperation, teachers have to be patient with students and give them time to learn how to cooperate and to explore creative possibilities, and students can be asked to articulate those aspects of their cooperative experiences which have been satisfying, beneficial and interesting to them.

Hennessey (2004) also gives practical advice to develop a creative climate, but from the other side, as she articulates five environmental constraints that have consistently proven to be sure-fire killers of intrinsic motivation and creativity: expected reward, expected evaluation, competition, time limits and surveillance. She also notes that this list could be labelled as a recipe for a typical American classroom, and most of the time the educational environment is structured in such a way that intrinsic motivation and creativity are bound to suffer, or be completely destroyed in spite of the fact that it was clearly demonstrated decades ago that expected reward may undermine children’s intrinsic interest (Lepper, Greene, Nisbett, 1973).

The basic principles of operational conditioning and reinforcement (as reinforcement causes a behaviour to occur with greater frequency and punishment causes a behaviour to occur with less frequency) do not always work in the learning and creative process. Pink (2009) turns our attention to the theory of motivation 3.0 and states that extrinsic rewards may be useful and even motivating for routine or dull tasks, which are not very interesting and do not demand much creative thinking, or in the case of algorithmic, rule-based solutions, some of the things we do every day. But in the case of more complex and creative processes “carrots and sticks” (as he calls extrinsic rewards) can extinguish intrinsic motivation, diminish performance, crush creativity, crowd out good behaviour, encourage cheating, shortcuts, and unethical behaviour, foster short-term thinking and can also become addictive. Hennessey (2010) also emphasizes that the promise of a reward often undermines intrinsic motivation and the qualitative aspects of performance, including creativity, but underlies the

complexity of the issue. Motivational characteristics may also influence the effectiveness of learning through deep and surface learning processes (Ramsden, Beswick, Bowden, 1986).

In the light of these principles it can be asserted that schools should create an atmosphere that allows students to feel in control of their learning process, teachers should critically review the incentive systems that are currently in place and students must be helped to become more proficient at recognizing their own strengths and weaknesses (Hennessey, 2004), so on the basis of realistic self-knowledge their task choice and level of demands can be realistic, too, which provides later successes. .

Summary

Summarizing the environmental determinants of creativity at school it seems we can state unequivocally that identifying and developing these environmental factors in an educational context is of a great importance. Theory and practice should focus on the question of how an average classroom can be transformed into a challenging, interesting, motivating opportunity, where knowledge, creativity and problem-solving skills are also developed. The 2007 McKinsey report about the world's best-performing school-systems emphasizes the quality of teaching as a critical point for schools' effectiveness, and thus encourages us to carry out further research in the area of creative climate and to articulate certain points of intervention that support the development of an innovation-friendly atmosphere at schools and at workplaces. Beghetto (2010) also claims for connecting creativity research to teacher preparation, and implementing new pedagogical models that support the development of creative potential and academic learning. For the first step it seems indispensable to make a tool for the assessment of creative climate that can be used to gain information about the climate characteristics and its relationship to school effectiveness, motivation, involvement in learning, achievement and other dimensions. This work has been already started by the research group of the University of Debrecen, Hungary. On the basis of these findings practical advice can be given to teachers and administrators to create a learning climate that fosters creativity and motivation, in order to establish a motivation-sensitive teaching practice in creating a positive motivational climate to enhance school achievement and effectiveness as an ultimate purpose.

According to Robinson (2009), “the world is changing faster than ever in our history. Our best hope for the future is to develop a new paradigm of human capacity to meet a new era of human existence. We need to evolve a new appreciation of the importance of nurturing human talent along with an understanding of how talent expresses itself differently in every individual. We need to create environments – in our schools, in our workplaces, and in our public offices – where every person is inspired to grow creatively. We need to make sure that all people have the chance to do what they should be doing, to discover the Element in themselves and in their own way” (Robinson, 2009, p.xiii).

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