ABSTRACT
The article aims to present the concept of creativity and creation in the context of its deliberate support in the educational environment. It presents the determinants of this process from four perspectives: individual determinants, environmental determinants, the course of the process and product features. The importance of the environment for the development of creativity, pointing to the relational and contextual conditioning and understanding of creativity, is also addressed in the paper.

Key words: contextual psychology, determinants of creativity, educational assessment, innovation

In the modern world, creativity and innovation have become goals of not only practical or business activities. The concepts also set goals for modern education. These reasons prompted researchers to actively search for innovative solutions to research and develop these functions. Their common element is reflection on the phenomenon of creativity and its development (Nickerson, 1999; Robinson, Azzam, 2009).
DIFFERENTIATION BETWEEN CREATIVITY AND INNOVATION

In psychological literature, there are numerous definitions of the terms *creativity* and *creation*, from beautiful metaphors to behaviourist explanations. There is also a distinction between creativity and innovation (Carlgren, Rauth, Elmquist, 2016; Marshall, 2013). It is now recognised that innovation is not a component of creativity (and vice versa). It is believed that the difference between creativity and innovation is in their goals. Creativity is about liberating the potential of the mind to imagine new ideas. These can manifest themselves in many ways, but most often they become something that we see, hear, smell, touch or taste. Also, creative ideas can include experimental thoughts in the mind of one person.

Innovation is completely measurable. It is about making changes in relatively stable systems. These changes may include producing something or making a correction in something that is already there. Identifying an unrecognised and unmet need, a person or organisation uses their creative resources to introduce and test a change, i.e. innovation. It can therefore be said that creativity concerns the thinking process as well as production and implementation, while innovation uses creativity to introduce a new solution. If creativity does not include the production or implementation stage, only the characteristics of the individual or organisation remain.

**Table 1. Differentiation between creativity and innovation (own resources)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Process</th>
<th>Output</th>
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<tbody>
<tr>
<td>Creativity</td>
<td>Thinking</td>
<td>New ideas</td>
</tr>
<tr>
<td>Innovation</td>
<td>Creation and implementation of an idea</td>
<td>Innovation</td>
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CREATIVITY AS A PHENOMENON

Gardner perceives creativity as asking new questions that go beyond standards, questions asked by an intelligent person seeking new phenomena (Gardner, 1993). On the other hand, Csikszentmihalyi (1999) indicates that it is creating something different and new, i.e. a *variation* on an already existing
idea. In the Polish literature, Nęcka, a psychologist of creativity, distinguishes them in the following way: *creativity* is used to avoid potential misunderstandings that may arise due to the ambiguity of the term *creation*. According to this approach, creativity should be seen as a characteristic of a person, or a maker, whereas creation is a characteristic of a product (Nęcka, 2005). When exploring the notion of *creativity*, it can be stated that “it usually manifests itself in a form of observable conduct consisting in the production of new and valuable products (e.g. poems, literary works, cabaret jokes), and sometimes the conduct itself may be a product (e.g. choreographic work)” (Nęcka, 2005.) This definition of creativity draws attention to the issue of novelty and value of products, paying attention to the features of the product. Thus, it is yet another concept of creativity.

In the above approach, the difference between creation and creativity and innovation could refer to the distinction between creativity understood as a feature of a person and his/her potential, and creation related to the product and its features.

**CONDITIONS OF CREATIVITY AS A COMPLEX PHENOMENON**

A meta-analysis conducted by Loo (2017) led him to build determinants for creativity in two dimensions: individual and collective. His meta-analysis is based on a review of literature in four areas: economics, management, sociology and psychology. Loo’s conclusions indicate that in order to create new and innovative products, makers use cognitive abilities, personality, and specialist knowledge. The process of creating takes place both individually and collectively, which is why in its course non-individual conditions become important. Education focused on a specific problem-solving process, trainings and a specific climate conducive to creativity are essential to its occurrence. This framework is evidenced by empirical chapters on the micro-workings of creative workers in the two knowledge economy sectors from global perspectives. The necessary conditions for creative work involve supportive environment, such as an infrastructure of supportive information, communication and electronic technologies (ICET), trainings, work environment and education.

This article has implications for informal and formal lifelong learning of workers. Teaching institutions need to offer multi-disciplinary knowledge of
humanities, arts and sciences, which exerts impact on programme structure, delivery approaches and assessments. At a macro level, governments need to offer a rich diet of cultural activities, outdoor activities and sports fixtures that inform potential creative workers in the areas of video gaming and advertising. This article has implications for the functioning of organisations that support and encourage collaborative work alongside individual initiatives, offer opportunities to engage in continuous professional development (formally and informally), and foster an environment which promotes experiential functioning and supports experimentation.

Among many theories of creativity in this trend, it is worth mentioning those regarding this process and its relation to artificial intelligence. In order to analyse various determinants of creativity, an integrative model of creativity determinants based on the “4P” model by Rhodes is adopted, according to which, creativity consists of four components, i.e. individual, process, product and environment (Garcês, Pocinho, Jesus, Viseu, 2016; Ricards, 1999). This means that creativity is a resultant of the interaction of an individual’s life context, his/her individual characteristics. The integrative model draws attention to the resources of the environment in which the features of the creative process and the specific characteristics of the product are rooted – the product that is made as a result of the creator’s activity, but also as a result of the specific process and purpose of the action. In this approach, the non-linear direction of the analysis of the creativity process and its products is assumed. Each element of the model is indispensable, irreplaceable and important at any moment for the creation of an effect (see Fig 1). Individual characteristics are based in genetic conditions, but their expression is also a manifestation of specific conditions created by the context in which a given individual lives (this applies to historical, social and family context). Interaction between these two dimensions of the determinants of creativity determines the course of the creative process as well as its product.

Integrating creativity education based on Rhodes’ model focuses on developing creative capacities—skills and attitudes that contribute to imaginative, creative, and innovative thinking.

Naturally, in the contemporary literature there is much criticism on the above theories (e.g. Garcês et al., 2016; Nęcka, 2005), nevertheless they create opportunities for both research on creativity and the creation and application of psychopedagogical interaction programmes, so important for working with children. The presented article focuses on the conditioning inherent in individuals.
INDIVIDUAL CHARACTERISTICS

The characteristics of creative individuals include their cognitive, emotional and personality characteristics. Physiological processes, such as the level of neurotransmitters and emotional states should also be added. Currently, when describing the cognitive functions crucial for the development of creativity, the importance of the frontal lobe and neurotransmitters, including noradrenaline, is pointed out.

Cognitive determinants as a basis for creativity have already been analysed by Getzels and Jackson (1962), Barron (1963), Wallach and Kogan (1965) and also Guilford (1967). The meta-analysis of research on the relations between intelligence and creativity indicates that intelligence is necessary, but it

1 Guilford (1967) was one of the first researchers who wanted to measure individuals’ potential for creativity (Kim, 2006; Zeng, Proctor, Solveroly, 2011).
is not a sufficient condition for creativity. Sternberg and O’Hara (1999) indicated five possible relations between creativity and intelligence. Some theories also indicate that emotional control processes and experienced emotional states significantly determine the way the creative process occurs. Some research has been conducted on the influence of emotions on evaluative and decision-making processes (Amabile, Barsade, Mueller, Staw, 2005; Baas, De Dreu, Nijstad, 2008; Fredrickson, 2001; Isen, Daubman, Nowicki, 1987). Researchers indicate that the positive affect has the following effects on cognitive activity:

- it provides additional cognitive material for processing and increasing the number of cognitive elements available to the association;
- it leads to vague attention and a more complex cognitive context, increasing the scope of those elements that are treated as relevant to the problem; and it increases cognitive flexibility, multiplying the likelihood that various cognitive elements will become associated (Davis, 2009; Winkelman, Kuntston, 2007).

CHARACTERISTICS OF THE PROCESS

The creative process often involves: identification of a problem, exploration of multiple solutions, and acceptance of a risk of failure as the best solution emerges.

There are different models of creativity in literature. Nijstad and De Dreu (2002) introduced two of them. The first of them refers to its stages. The first stage is an incubation phase, which results from the development in the long-term perspective and the collection of various types of experience. The second stage is a phase of a breakthrough idea (flash), the third is a stage of improving

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2 Studies on the relation between these two concepts point to high correlations in psychometric tests. Wallach and Kogan (1965) described studies conducted among 151 11-year-olds (grade 5 in the US) in which they compared their originality and fluency with intelligence. The relations between the results of the intelligence test and the results of the creativity test were \( r = .09 \) (Pearson correlation coefficient). Silva (2008) also confirmed low dependencies between intelligence and creativity. He also conducted a re-analysis of earlier studies of Kogan and Walach. His studies, in which he also used Wechsler intelligence scale for children and Torrence Creativity Test, showed the relationship between these functions at the level of 20% (latent variable analysis model).
the idea or product (correction phase). The fourth stage is related to investing in the solution and its development to the best form. Nijstad and De Dreu (2002) also presented a study conducted by Batey who combined these stages with the dominant aspects of creativity in each of them.

At the stage of “generating ideas” fluency, originality, incubation and illumination are important. In the second phase, individual personality traits such as curiosity, openness to experience, as well as constructing cognitive schemes and tolerance for ambiguity are important. In the third stage, personality traits are also essential as well as the type of motivation (internal, external and achievements), owing to which individuals remain involved in the improvement of their ideas. In the fourth stage, multi-dimensional nature of determinants can be pointed. Experimentation, which can also be a creation, continuation, generalisation, but also implementation of a given solution is based on individual resources (self-confidence, determination), but also environmental factors (opportunities, time, interest).

CHARACTERISTICS OF THE ENVIRONMENT AND ITS FEATURES

Following the theses of Vygotsky and Goswami (2008), it is indicated that development is a process dependent on experience based on the acquisition of knowledge acquired in a specific cultural and social context. Therefore, creativity would be a specific resultant of individual characteristics and experiences acquired and lived in a specific context of development.

The environmental feature to be taken into account is the social-technological potential in which an individual lives. This potential indicates what problems can be posed and what measures will be used in the process of creation. Due to technological advancement, it is indicated that it is possible to create not only intelligent, but also creative networks of artificial intelligence (Schmidhuber, 2012). In this case, attention should be paid to the principle

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3 In this paper, a distinction was made between environment and the context of development. The environment for individual development is represented by all potential possibilities inherent in the environment, and the context of development is everything with which individuals interact mentally and physically, and thus becomes a real building block for the transformation and development.
of, for example, linguistic relativity, which indicates that language can influence mental thoughts and created mental representations. Therefore, the determinants inherent in the culture, values and attitudes created by it will be presented.

**The role of culture.** Creativity and art were recognised and understood differently in ancient times, the Middle Ages or today. A different status was attributed to creators and their works (Sternberg, 2006). Contemporary intercultural research indicates differences in the understanding of the concept and process. Comparative studies between “Western” and “Eastern” cultures show that Westerners perceive creativity more in terms of individual attributes of a creative person (e.g. aesthetic taste), while the Chinese view creativity through the prism of benefits that creative people can bring to society (Niu, 2006). The study by Smith and Carlsson (2006) shows that in the Nordic countries creativity is seen as an individual attitude that helps in coping with life’s challenges. In contrast, in Germany it is seen more as a process that can be used to solve problems. However, the meta-analysis of the concept of creativity carried out by Mpofu and associate (Mpofu, Myambo, Mashengo, Mogaji, Khaleefa, 2006) revealed that in African languages (he studied 28 African languages) there is no word that directly translates to “creativity” (the exception is Arabic, which was the 28th language). It is a remarkable result knowing that African culture has a rich heritage of creative activities such as music, art and storytelling.

**Values in society.** As for the environment, it should be emphasised that the values of a given society and its culture manifest themselves in the organisation of a habitat.

**Attitudes.** Therefore, in addition to non-specific factors, such as the approach to individual development, its goal (manifested in the organisation of education, nutrition or psycho-physical hygiene), ways of establishing interpersonal relationships or creating a structure of these relationships (safe relationships in the group, parental care) attention should be drawn to specific factors that develop curiosity, risk taking, flexibility and adaptability, dealing with uncertainty and divergent thinking (Harvey, 2014).

**Conditions hidden in the environment.** According to this assumption, the principles of environmental organisation that directly support the process of creativity and innovation can be indicated (Paulus, Dzindolet, 2008). The basic assumptions of a creative environment should be:
1. Physical learning environment allows for flexibility, so learners can work alone, in small groups, and in larger groups.

2. Creative environment is welcoming; it is a place where learners feel safe in taking risks.

3. Creative work is visible, communicating the importance of process and production.

4. Environment itself is stimulating and may serve as a provocation for questions and investigations.

5. Learning often extends beyond the confines of the physical environment.

**Group norms and team work.** Harvey (2014) also points to the need to analyse an environment conducive to creativity in terms of prevailing group norms and ways of communication. He believes that the diversity of team members and their knowledge can increase the team’s creativity by introducing different perspectives that can be integrated in an innovative way. However, under certain circumstances, diversity may also reduce the team’s creativity, making it difficult for team members to communicate their ideas and it may cause interpersonal conflicts between people with different perspectives. Therefore, to avoid conflicts and teamwork disadvantages, group processes must be controlled.

Team standards should be based on:

1) respecting others’ knowledge,

2) paying attention to the ideas of others,

3) expecting information exchange,

4) tolerating misunderstandings,

5) negotiating,

6) staying open to the ideas of others,

7) learning from others and building on mutual ideas

8) lack of hierarchy and business dependency.

Moreover, a leader of a team should have sufficient communication skills that will allow him/her to understand different members of the group (if they differ in the ways of communication, e.g. Salazar, Lant, Fiore, Salas, 2012).
CHARACTERISTICS OF THE PRODUCT

When exploring the notion of creativity, it can be stated that “it usually manifests itself in a form of observable behaviour consisting in the production of new and valuable products in material and non-material form (e.g., movement, Nęcka, 2005). This definition of creativity draws attention to the novelty and value of products. In classical literature, the elitist approach emphasises that creativity is a unique feature in only a few outstanding individuals. The products they create, for example in the form of literary work, are innovative enough to be appreciated and have great value for humanity.

Creativity understood as a product which is significant for the society finds its exemplification in economic approaches. The economic approach to creativity focused on three aspects – the impact of creativity on economic growth, methods of modelling creativity markets and maximising economic creativity (innovation).

Creativity leads to capital, and creative products are protected by intellectual property rights (Hargadon, Bechky, 2006). Rubenson and Runco tried to describe the “psycho-economic” model of creativity (1992). In this model, creativity is a product of donations and active investment in creativity; the costs and benefits of introducing creative activity to the market determine the supply of creativity. In this approach, a creative person becomes a creator of innovative products and solutions, but he/she is also a kind of “product” of the impact and investment of the society in the development of creativity. Thus, a creative product (in a dual sense as a subject – creator, and an object – the result of a creative process and a real product) is determined by the potential and conditions created by the environment (resources, technological level, values, tools), skills to control and develop creativity processes, which were acquired during education, personality traits, as well as intrapsychic conditions.

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4 Individuals who successfully go through this process can create the „creative class” which is perceived as an important motor of modern economy.
The presented overview of determinants shows a multilevel development of creativity understood as a feature of individuals, processes and products. The figure below presents a model of determinant interactions. Intrapsychic and personality determinants interact with social, cultural and technological conditions. These interactions become a context of individual development and shape the process of creativity understood as the process of thinking or the process of creating solutions at its every stage. The final effect is the result of the interaction of the first three determinants, because it is always created/produced by someone (the author) in a specific environment (place, time, materials, problem) and in a specific way (thinking processes, strategies and materials, prior solutions, time, knowledge).

The development of natural predispositions, such as creativity, depends on the environment of young people and their interaction with it. Therefore, it seems right to research, diagnose and support the natural creative potential of individuals. Appropriate conditions and possibilities should be shaped in the environment and the undertaken actions (process, product). It also seems justified to conduct longitudinal research into the relation between the functioning of children’s cognitive processes and creativity and the impact of vari-

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**Fig. 2.** The role of environmental factors in the process of development of creativity (own resources)
ous psycho-pedagogical interactions that change the environment for the development.

Some see the conventional system of schooling as “stifling” of creativity and attempt (particularly in the preschool/kindergarten and early school years) to provide a creativity-friendly, rich, imagination-fostering environment for young children. Researchers have seen this as important because technology is advancing our society at an unprecedented rate and creative problem solving will be needed to cope with these challenges as they arise. In addition to helping with problem solving, creativity also helps pupils to identify problems where others have failed to do so. See the Waldorf School as an example of an education program that promotes creative thought.

Promoting intrinsic motivation and problem solving are two areas where educators can foster creativity in pupils. They are more creative when they see a task as intrinsically motivating, valued for its own sake. To promote creative thinking, educators need to identify what motivates their pupils and structure their teaching around it. Providing pupils with a choice of activities to complete allows them to become more intrinsically motivated and therefore creative in completing the tasks. The four-plane perspective (individual, environment, process and product) of understanding the determinants of creativity provides an opportunity to observe this process and to create conditions that support it.

REFERENCES:


