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Creative and Reproductive Behaviour of Early School Education Students

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Abstract

The key concepts in the paper: *creativity* and *reproduction* were characterised. Persons with creative behaviour have nonconformist and heuristic features, whereas those with imitative attitudes display conformist and algorithmic traits. The research was carried out by means of a diagnostic survey on a 100-person group of Year 2 Early School Education students from the Lubuskie Province in 2016. Answers to the following question were sought: *What behaviour is displayed by early school education students?* The Creative Behaviour Questionnaire - KANH - II, constructed by S. Popka (1990), was used. In the light of the research, it appears that 46% of the studied early school education students display creative behaviour, 35% - reproductive behaviour and 19% - both creative and reproductive behaviour.

Keywords: Student, Creativity

1. Introduction

Contemporarily, creativity is required in every field of life. Innovation and invention are synonyms of development and progress, which makes it easier for us to solve problems in relation to the present state.

Therefore, teachers' work cannot be limited to the adaptation of the contemporary reality, but must prepare for its reconstruction. Therefore, students of early school education must display creative behaviour towards pedagogical work, which should be reflected in their creative and innovative activity.

2. The Essence of Creativity and Reproduction

In a way of introduction, the basic notions relevant to the present considerations, i.e. creativity and reproduction, should be explained. The attention to the terminological precision is rooted in the fact that every scientific discipline describes the researched phenomena by means of their own notions, so that scientific considerations and statements are presented as accurately, communicatively and tangibly as possible. Therefore, I will present their understanding for the purpose of this paper.

Concepts are defined by people, who by adopting new definitions change their ranges. Changes in defining result from changes in the type of social practice. Hence, **creativity** as a concept is constantly evolving, changing its scope. People of antiquity and the Middle Ages were convinced that creativity was a godly attribute. The concept of creation appears in the theory of art and poetry as late as in the 18th century. In the 20th century, however, the term started to be applied to the whole of human culture (Tatarkiewicz, 2017). Thus, people from all areas of human production can be creators. Creativity is a process involving psychophysical undertakings of humans and their new and socially valuable constructions (Magda-Adamowicz, 2015). The process and product of creativity, as two basic components, are connected (ibidem) and, according to A. Nalaskowski (1998), can be perceived as qualities or personality structures.

Creativity is recognised through the novelty and originality of the product, but it is not always accompanies by novelty, as each act of creativity implies novelty, but *not every novelty implies creativity* (Tatakiewicz, 2017). This means that whatever we do is similar and at the same time dissimilar to what was already there. It is also important that the novelty is subject to *gradation* (ibidem). Nonetheless, we do not have a meter with which to measure this novelty and determine its degree. The higher the degree of novelty, the more attributes of creativity it assumes. There are qualitatively diverse types of novelty in creativity (ibidem). It has qualities which were not previously present, i.e. it encompasses a new shape, model and method. Also, the novelty accomplished by creative people is rooted in different attitudes, minds, skills and talents accepted and represented by them, i.e. it can be: intentional - unintentional, impulsive - directed, spontaneous - methodical, explored and considered. The creative entity with its endo- and exogenous conditions is of importance here (Magda 1999).

The last feature of new (or creative) work is its *effectiveness:* theoretical - practical, indifferent - cataclysmic, trivial - momentous. Novelty characterised by high degree of quality and efficiency turns into creation (Magda-Adamowicz, 2007, 2012).

Creativity - resulting from heuristic thinking - is a process of solving (in problematic situations) divergent problems, resulting in new, socially unique, original, shocking and ground-breaking inventions (such as innovations, copyright programs, etc.) and affecting high levels of effective functioning (Magda-Adamowicz, 2015). In this context, we may speak of objective creativity. Individuals adopt a creative style of work by self-realisation. Their creative activity is systematic, competent, widely spread, frequent, complete, outstanding, diverse, critical, self-reflective, and conscious. They document and disseminate their deliberate output. They are authors of many breakthrough innovations and provide outstanding and lasting contribution to the development of culture (Magda-Adamowicz, 2009, 2011).

Creativity stands in opposition to the concept of ***reproduction***. However, in the olden days, the term "imitation" was used instead, which denotes repetition. In the classical period, four different concepts of imitation were used: 1) primal, ritual in the context of expression; 2) Democritean in the sense of imitating the ways in which nature operates; (3) Aristotlelian, i.e. free creation of a work of art with a motif of nature, and (4) Platonian, as copying of nature. The original precision of the meaning of the concept of *reproduction* gradually disappeared, and the Democritean use was recognised by few thinkers, whereas the understanding supported by the terminological precision of Plato and Aristotle was bestowed with universal and lasting qualities. From the 16th to the 18th centuries, theoreticians took the principle of imitation into account, whereas those who supported Plato's approach rejected the notion of *imitation*. It was accepted by the followers of imitation as an Aristotelian concept. The Italians of the Renaissance period used the phrase "ritrarre", meaning "to portray" (Tatarkiewicz, 2017).

Over time, *reproduction* was understood as verbatim copying of reality and the production of its illusions. The above theories assumed that works of art expressed the artist's ideas and experiences by simultaneously imitating reality. There was also the view that imitation is not only easier for the artist but also possible (Tatarkiewicz, 12017). Works of art are always created from a different material than the actual item. Therefore - as Gogol observes - another thing is important in the work of creation, and another in reality.

The development of the theory of imitation proceeded from understanding it in narrower terms to the broader and from understanding it as an assertion to being a postulate. Thus, reproduction has various functions, such as expression, construction or accurate representation of reality. In the future, these and other functions of reproduction would alternately prevail and recede.

3. Interest in Creativity in Poland

In Poland, there are scientists who have made creativity subject of their research and

deliberations. One of them is A. Góralski (1990), who heads the Heuristics section of the Polish Cybernetic Society and the Heuristics Team of the Intercollegiate Institute of Philosophy and Sociology and the Postgraduate Creative Thinking Study at UMCS in Lublin.

In the Polish language and sociological analyses, the term *innovation* was introduced as a phenomenon studied by Z. Pietrasiński (1990), and by which we understand deliberately introduced changes, consisting in "replacing the existing states of things with others, positively assessed in the light of certain criteria and amounting to progress". Z. Pietrasiński (1990) also proposes an interdisciplinary science of innovation labelled as *Innovation Studies*. On the other hand, *pedagogical innovation studies,* which deal with the study of change, is being developed on the pedagogical ground, emerging in the fields of upbringing and didactics, and social background is of significance in its context.

In the pedagogical sciences, a subdiscipline: *pedagogy of creativity* is being developed, which has not yet gained such a scientific recognition as early school, preschool or social pedagogy (Giza, 1999; Schulz, 1994). In its broad sense, it refers to pedagogical innovations and represents the practical art of creation, as well as the study of creativity (i.e. the type of thinking about shaping creative people in the process of education) and the theory of innovative activities (ibidem). Krzysztof J. Szmidt (2007) analyses the views of Polish social pedagogues (K. Korniowicz and H. Radlińska) on creative attitudes and creativity, in the context of which they discuss the contemporary theories of creative attitudes, simultaneously referring to universal creativity, and create and implement a copyright creativity programme in integrated teaching. Also the author of this text examines the attitudes and competences of teachers towards pedagogical creative work and analyses the process of the creation of educational programmes (Magda-Adamowicz, 2007, 2009, 2012, 2015).

On the other hand, W. Dobrołowicz (1995) suggests psychodynamic creativity of a practical nature, i.e. combining knowledge from the border of psychology and pedagogy, which aims to diagnose and develop pupils' and their teachers' abilities and creative attitudes and evaluate pedagogical innovations. He proposes thirty sample tasks and tests used to study divergent thinking. These are mainly projective drawing tasks consisting in transforming the original drawing form (sketch test, figure tests, formal associations, "different characters") or searching for the optimal location of figures according to a specific rule (checkerboard test), designing various improvements (children's improvement project of mail delivery). This test is meant to identify creative potential of divergent thinking.

In Polish psychology, creativity is associated with solving problems (Kozielecki, 1987). For Aleksandra Tokarz (2005), the process of creative activity is a mental process that organises creative activities that produce creative effects in the form of ideas. In the theory of personality, creative behaviour is an activity aimed at changing an initial state into an ideal. Also, when people aim at far-reaching goals, they often embark on creative actions (Obuchowski, 1985). The research by T. Żuk (1986) on creative personality is also interesting. He defined the correctness of the process of creation by analysing the differences within creative thinking and established the indicators of creativity by analysing its external and internal conditioning. Edward Nęcka (2001), criticising the phases of creativity identified by

e.g. P. P. Guilford, proposes a creative process as a set of interactions, i.e. a process of continuous and reciprocal interface accompanied by the fine-tuning of goals. A creative process, when accompanied by a goal and when introduced according to a certain strategy, concludes with the overcoming of social barriers, and the creation of ideas. S. Popek (2010) treats creativity as attitudes that are genetically conditioned and developed in the course of individual experience.

Only the most popular research and reflections on creativity were presented, but generally speaking - as can be seen from the above - only few researchers in Poland have dealt with the issues of creativity. This subject has been avoided, as non-scientific, mysterious, embarrassing and disrupting the scientific face of education (R. May, 1994).

4. Creative and Reproductive Behaviour

The presented reflections, and above all, the interactive theory of abilities, constitute a theoretical background for the concept of creative behaviour by Stanisław Popek (2010). This theory takes into account the coexistence and reciprocal influence of several spheres of human personality, without any preferences, on individuals' potential, including their abilities and creativity. The overall model of ability consists in the interaction between the genotype and the environment, and within these factors: on the one hand, interactions of different spheres of personality conditioning (intellectual, special and creative) abilities, i.e. motivation at the border of the genotype and the environment, and on the other hand, interactions that take into account different types of environments exerting a significant impact on the exposure, activation and capacity of abilities. Hence, S. Popek, by suggesting an interactive model of ability, adopts the interactive impact of the social (family, peer group, school) and ecological environment on motivation, intellectual ability or special and creative abilities. On the other hand, if individuals have motivation, intellectual ability, special and creative abilities, then they may be labelled as gifted. Abilities are manifested in action (or through the product of an action), so a division into implementing and potential (resulting from psychological measurement) abilities was introduced. Potential abilities do not overlap with the abilities of implementation. The latter are dependent on cognitive, executive and motivational abilities. Such a conviction of the author requires abilities to be placed in the sphere of personality, where the implementation potential is defined as a creative foundation (A.H.Maslow, E. Erickson, E.From).

The concept of Popek assumes that creative and reproductive behaviour consists mainly of two spheres: cognitive and characterological. The cognitive sphere, resulting from intellectual dispositions and instrumental potential, i.e. high sensitivity and perception ability (memory, perception), memorisation (mainly processing and producing new information), imagination, intuition and divergent thinking, was defined as heuristic behaviour. The contrasting features are represented by the convergent type, or algorithmic behaviour. Although heuristic behaviour is decisive for the personality of a creative person, algorithmic behaviour is also taken into account in the research, because the value present in the ability measurement is treated dynamically as a continuous feature.

The second sphere is a set of characterological characteristics that ensure active realisation of individual cognitive abilities. The effective realisation of cognitive predispositions is only possible within the interaction with other features, which S. Popek conventionally defines as nonconformist and conformist attitudes. Creative individuals are characterised by nonconformist and heuristic behavioural patterns. On the other hand, the reproductive attitudes are marked by conformist features and algorithmic behavioural patterns.

Nonconformity (N) is characterised by the following characteristics: independence, activity, vitality, adaptability, originality, consistency, courage, dominance, self-organisation, independence, expressiveness, openness, resilience, persistence, self-criticism, tolerance, high self-esteem etc. Conformity (K) is defined by the opposite set of characteristics.

On the other hand, persons with heuristic behavioural patterns display the following characteristics: independent scrutiny, logical memory, productive imagination, divergent thinking, reconstructive and independent learning, learning through reasoning, intellectual elasticity (flexibility), cognitive activity, reflexivity, intellectual independence, structural and verbal creativity, as well as the potential for artistic creativity. The above concepts are illustrated in the figure below:

Characterological factors			
Reproductive behaviour	K.Conformity A. Algorithmic features	N. Nonconformity H. Heuristic features	**Creative behaviour**
	Cognitive factors		

Source: S. Popek, 1990

However, there is a tendency to formulate simplified and generalised judgments based on tests or common observations, which results in labelling individuals as positive (creative) and negative (reproductive). It should be noted here that both types of convergent and divergent thinking are of importance in human behaviour, and more specifically in the learning process, since the function of assimilating and understanding information constitutes a basis for social learning and adaptation, as well as for the processing or creation of information. Therefore, I emphasise that many human activities require both algorithmic and heuristic activity as well as both conformist and nonconformist thinking. This leads to the mastery in the development and execution of mental and manual activities. It can be said that creative and reproductive behavioural patterns are equally important in the functioning of individuals, fulfilling the innovative (creative) and the adaptive (adaptive) functions. This is a dialectical mechanism which, according to S. Popek (ibid), makes creative adaptation possible.

As the goal of these considerations is to identify creative and reconstructive behaviour, heuristic activities and nonconformist thinking appreciate in value (see S. Popek, ibid.).

5. Methods

5.1 Participants

The research was carried out on a 100-person group of Year 2 Early School Education students from the Lubuskie Province in 2016. Out of the 100 students, 21 live in rural areas, 37 in small towns, 32 in cities, and 10 failed to stipulate their place of residence. 24 people are of intellectual origin, 57 are working class, 6 from farming families and 13 displayed no information about their origin. All respondents are 20-23-year-old women studying pedagogy and specialization in pre-school and early-school education.

5.2 Procedure

It sought answers to the following question: *What behaviour is displayed by Early School Education students?* It is assumed that students exhibit reproductive behaviour. The main dependent variable is students' behaviour, and more specifically their creative behaviour (nonconformist thinking and heuristic features) and reproductive behaviour (conformist thinking and algorithmic features).

5.3 Materials

The research made use of the KANH - II Behavioural Questionnaire, constructed by S. Popek (1990). This tool does not measure specific aptitudes "for something" or categories of activity, such as teaching, but allows to diagnose general creative and reproductive abilities in cognitive and motivational spheres of human personality. The KANH Questionnaire Key and the answer sheet constructed by S. Popek were used for calculations. These tools are standardized and published in the monograph. Questionnaire of KANH's creative behavior in 1990 and 2000. Its author, with whom I work closely, agreed to use it.

Accurate calculations and results remain in the author's archives. In order to understand their nature, I will describe an example of an analysis of results obtained by one researcher. The KANH questionnaire makes it possible to measure scores from 0 to 30 on the (K, A, N, H) scale by awarding from 0 to 2 points for each answer. The maximum number of points was 60. The scales K - N and A - H are opposite polarities of behavioural results. Therefore, in such a sense, the points obtained are treated separately (see S. Popek, 1990). For example, a respondent received 12 points on the K (conformist) scale and 29 points on the N (nonconformist) scale, so the person's behaviour is characterised by the prevalence of nonconformist characteristics. Within the cognitive sphere, the respondent received 7 points on the A (algorithmic) scale and 13 points on the H (heuristic) scale. Thus, heuristic features dominate in this sphere. In the Key to the KANH Questionnaire, 60 questions are specified, which correspond to 60 guilds - 30 creative behaviors (15 nonconformist and 15 heuristic) and 30 reconstructive (15 conformist and 15 algorithmic). The intensity of individual scales for both spheres is a vector of creative and reproductive behaviour (ibid). Therefore, according to the theory of interaction (in which coefficients are treated as a sum of partial variants), we can use the sum of scales of both K + A and N + H, which we record as:

Sphere	Reproductive behaviour	Creative behaviour	Total
Characterological	p. 12	p. 29	p. 41
Cognitive	p. 7	p. 13	p. 19
Total	p. 19	p. 41	p. 60

The above statement shows that the respondent displays creative behaviour (p. 41), with the dominance of characterological features (ibid).

If the difference between creative and reproductive features is between 20 and 30, then the behaviour is very distinct. In the example, the difference amounts to 22 points. Thus, this points to distinct creative behaviour. There is then very distinct creative or reproductive behaviour (the difference of 30-20 points between both qualities), distinct (the difference of 19-10 points) and weak (the difference of 9-1 points).

6. Results and Discussion

In order to determine the behaviour of the students of Pedagogy, the above factors were taken into account, which is illustrated in the table below.

Table 1. Creative and Reproductive Behaviour in Students of Pedagogy

Behaviour	No. of persons with: Creative	Reproductive	Creative and reproductive	Total
Very distinct	11	3	-	14
Distinct	24	26	19	69
Weak	11	6	-	17
Total	46 (46%)	35 (35%)	19 (19%)	100 (100%)

Out of one hundred early school education students, 50 display **creative behaviour**. In 11 people *very distinct creative behaviour* was revealed. The cognitive sphere is dominant in them. 10 of them have created innovations. The very distinct creative behaviour in students of extra-curricular Pedagogy is characterised by: independence of observation, logical memory, cognitive activity, intellectual independence, i.e. creative, logical memory, reconstructive/independent learning, cognitive activity, high efficiency of construction, technical ability and verbal creativity. 24 displayed *distinct creative behaviour*, out of whom 13 have taken the trouble of creating innovations. Also, the cognitive sphere and heuristic behaviour aresp dominant in them, which are manifested above all by the autonomy of observation. *Weak creative behaviour* is displayed by 11 students. None of them have created innovations. There is a balance between the cognitive and the characterological spheres and

between the heuristic and nonconformist thinking. Heuristic behaviour in these individuals is characterised by independent observation, logical memory, reconstructive learning and high structural efficiency. Nonconformist thinking in those with *weak creative behaviour* is primarily manifested by their self-organisation and openness.

There are also three categories within the category of ***reproductive behaviour***: very distinct (there is a very large difference of 11 to 16 points between creative and reproductive traits), distinct (the difference between these characteristics is 6-10 points) and weak (difference of 1- 5 points). Reconstructive behaviour is displayed by 35 students. *Very distinct reproductive behaviour* is displayed by 3 individuals, one of whom is a student living in a city. There is a balance between cognitive and characteristic spheres, and between algorithmic behaviour and conformist thinking, which has the following characteristics: directed perception, reproductive imagination, conformist thinking, reproductive learning, directed and rational intellectual stiffness, cognitive passivity and verbal reproduction. *Distinct reproductive behaviour* is displayed by 26 individuals. The cognitive sphere dominates over characterological. Algorithmic behaviour prevails with the following characteristics: acute perception, reproductive imagination, conformist thinking, targeted learning and understanding, cognitive passivity and lack of technical ingenuity. Weak reproductive behaviour is manifested by 6 persons, in whom the characterological sphere dominates over cognitive. The 6 students' conformity is characterised by dependence, stereotypical attitudes, subordination and defensiveness.

19 students are characterised by a relative balance between characteristics that determine *creative and reproductive types of behaviour*. This is possible because they display abilities (e.g. to copy pedagogical work, artwork etc.), but this does not prevent them from creating their own compositions, modifying lesson plans etc., based on imagined visions (Popek, 1999). 7 of them have created pedagogical innovations. The characterological sphere and conformist thinking is dominant in 3 of them. In the characterological sphere, there are mutually exclusive features, which causes that the respondents have changeable moods, are unpredictable, easily give up new ideas, and are also easily excited by new tasks.

10 students are characterised by the cognitive sphere and algorithmic behaviour with such features as: reason-based learning, convergent thinking, reproductive imagination, lack of constructive ingenuity and cognitive passivity.

7. Conclusion

In the light of the collected empirical data, we may sum up that 46% of respondents are characterised by creative behaviour (with dominant heuristic behaviour), 35% by reproductive behaviour (determined by conformist thinking and algorithmic behaviour) and 19% displayed both patterns. In contrast, 34% of respondents with creative and creative/reproductive behaviour have created and implemented pedagogical innovations directly to their professional work. However, they do not want to take on the risks and responsibilities of educational innovator. Their innovative work is primarily concerned with

the didactic process and is related to weak or gifted pupils.

The obtained results are satisfactory and do not confirm the formulated assumption about the dominance of reproductive behaviour among students. The researched students have the potential for creative, innovative pedagogical work. Thus, pedagogical creative work is possible and real. However, there is a need for appropriate adaptation in the course of teacher training.

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