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**INNOVATIVE CONCEPT “INDIVIDUAL TRAJECTORY OF
DEVELOPMENT- CREATIVE THINKING OF CHILDREN -
EDUCATIONAL ENVIRONMENT”**

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Abstract

The article explores the social and pedagogical aspects of forming the innovative thinking of preschool children. Four categories of innovations are considered: big-innovations, pro-innovations, little-innovations, mini-innovations. The approaches that can be used in the formation of innovative thinking of trainees are indicated. The concept of "innovative educational environment" and its components are indicated. The results of sociological research on the problem of innovative activity of teachers are presented. The article describes a large-scale experiment on the formation of innovative thinking, which involved 250 children of preschool age. The diagnostic tools allowing to reveal the initial and final level of formation of innovative thinking of preschool children are presented. On the basis of the conducted research there was developed an educational-methodical complex aimed at acquiring an innovative thinking experience by a child, and its characteristics were given. The results of the introduction of the developed media games complex, which give advantages in the educational process of preschool educational institutions are reflected. A new approach to the formation of innovative thinking based on computer games when the material is presented in a game form is described; according to this approach a solution to a particular problem is found during the game process, and at the same time the formation of innovative skills of children is carried out. This article is dedicated to the first results of research in the specified areas of pedagogical and sociological activities.

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1. Introduction

Innovation and creativity are fundamental in any educational activity, and the creative process is also an important component of understanding learning experience.

It should be noted that creativity is not limited to the visual and performing arts, it is an integral component of all disciplines and professions. It is an active process that is always associated with innovation. Innovations can be considered as new ideas, new views on things, new methods or products that have value not only for the individual, but also for various professional activities and for the society in general. Innovation is almost always associated with hard work, dedication, and perseverance, without which a lot of good ideas will never be realized.

The creative process underpins innovation, and often these two words are used interchangeably. Creativity can be considered as the mental ability to comprehend (imagine) new, unusual or unique ideas in order to see a new connection between seemingly random or unrelated things. Undoubtedly, any creative process begins with creative thinking.

According to Kamylyis and Berki (2014), artistic (creative) thinking is defined as thinking, which allows pupils to use their imagination to generate ideas, questions and hypotheses, experiment with alternative solutions and evaluate both their own ideas, and ideas, processes, and finished products of others. Innovative thinking requires creativity to make connections that no one has made, to move from the known to the unknown. The introduction to the pedagogy of the “innovative thinking” concept as a type of learner's thinking was required in order to identify its features essential for the implementation of innovative activity in the integrated multicomponent thinking process (Usoltsev & Shamalo, 2014).

Kaufman and Beghetto (2009) divide all innovations into four categories, which help to reveal the nuances between their different levels and types:

1. Big-innovations (sometimes called “high art”)

These are the works of the “chosen ones” who have changed people's understanding of life itself and even its meaning with the help of their inventions. Their works were generally recognized as innovative, even if they seemed controversial at the time of creation. As an example, A. Einstein's theory of relativity and Darwin's theory of evolution, as well as a number of works of art, such as Picasso's “Guernica” or symphony No. 9 in D minor by Ludwig van Beethoven, can be cited.

For most of us big-innovations are beyond the reach, and their masters are often as unusual as their creations.

2. Pro-innovations

This type of innovation takes time (usually at least 10 years) and development efforts. A musician who has shown his abilities in childhood must learn, but already in the process of learning he performs famous works, bringing in his own tones.

3. Little-innovations

This is the ability to act with flexibility, intelligence and novelty in everyday life, leading to the creation of something new, original and significant. This everyday type of innovation can be observed in the work of a person solving a complex production problem, in the work of an enthusiastic gardener who designs flower beds, etc.

Little-innovations include practice and can develop over a long period of time.

4. Mini-innovations

It is a new and personally significant interpretation of experience, actions and events, the kind of innovation and art that can be brought up by teachers and parents. It is usually manifested in children's craft. Mini-innovations may be invisible to outsiders and consist entirely of ideas and connections created by pupils. According to Vygotskii (1966), any human act that generates something new, is called a creative act, regardless of whether the result is a physical object or some mental or emotional construct that lives in the person who created it and is known only to him.

There is Jean Piaget's (1951) famous phrase "to understand is to invent". This means, for example, that a pupil "invents" a new material for himself when he truly understands it. Mini-innovations can be described as a pupil's achievement in finding several different ways to solve a particular task. This may be a creation of new connections between the acquired knowledge and new information, which helps to understand the subject more fully.

Such level of innovative thinking is especially interesting for the educational process of any levels of education.

At present, sociologists pay serious attention to the concept of "innovative educational environment", which is described through the identification of its components such as society, organization and subject of innovative activity, which analyzes the problems of intellectual self-realization and human creativity as mechanisms for the implementation of intellectual resources, in the context of interpretation of the concepts of innovation and creativity, from the point of view of studying their methodological category, which is especially important for modern pedagogy and sociology. Modernization of the modern world cannot be reduced only to gadgets, technologies and economy, it concerns society as a whole, quality and a way of life of people, style of their thinking and behavior (Antipiev, 2011; Gashkova, Berezovskaya, & Shipunova, 2017). In turn, thinking is formed in the learning process. Therefore, the opinion that the special attention has to be directed to pedagogical innovations as the direction of development of didactics is fair (Bylieva & Sastre, 2018; Mynbayeva, Sadvakassova, & Akshalova, 2017). For example, digital technologies are changing the way we live, communicate, think, feel, influence other people, our social skills and social behavior (Bylieva, Lobatyuk, & Rubtsova, 2018; Kolomeyzev & Shipunova, 2017). High-tech environment such as computers, smartphones, video games and etc. change the human brain (Myamesheva, 2015). Today, the younger generation is called "digital", "social-digital" (Hietajärvi, Tuominen-Soini, Hakkarainen, Salmela-Aro, & Lonka, 2015) and "Z" generation (Howe & Strauss, 2009). It is characterized by "clip" thinking based on the processing of fragments of the visual image, and not on logic and text associations. The teacher's "role field" should be mobile: the teacher teaches and learns at the same time (Derijan & Valchev, 2012).

In a sociological study, the teachers' attitude towards innovation activity was measured by the question: "Do you use new methods and approaches (innovations) in your professional pedagogical activity?" 62% of respondents are engaged in innovative development, 20% are developers of scientific pedagogical projects that can bring innovative effect, 10% of respondents are engaged in invention and rationalization, 8% of survey participants are leaders of teams engaged in the development of innovations in the field of pedagogy.

Thus, the results of sociological studies show that teachers are actively engaged in innovative educational activities related to creative innovations.

It should be noted that innovative thinking of the younger generation can and should be specifically developed. The sooner this process starts, the more successful and in demand the child will be in the future, since innovative thinking is the key to competitiveness, professionalism and competence, and the creativity of the future specialist.

The most sensitive age for development of innovative thinking is the period of preschool childhood. The need for purposeful work on the development of innovative thinking of pre-schoolers was determined by:

- social need of the society in a creative person, who is able to master, transform and create new ways of organizing their activities, generate and effectively implement new ideas;
- the importance of creating a psycho-pedagogically reasonable conditions and game environment encouraging the development of a child's creative lifestyle and creative self-realization;
- requirements for the level of development of pre-schooler's thinking for learning at the next educational level.

2. Problem Statement

Formation of innovative thinking that transforms pragmatic thinking and is aimed at ensuring the innovative activity of the individual. Main consequences: creation of new types of innovations and creativity on the basis of education and training; ability to find various ways of solving problems on the basis of creation of new connections between the mastered knowledge and new information; solution of complex educational and professional problems on the basis of ability to act with flexibility, intelligence and novelty.

3. Research Questions

What are the ways to increase the level of innovative thinking formation of preschool children?

4. Purpose of the Study

To develop and experimentally test the efficiency of educational and methodical complex for the formation of innovative thinking of preschool children through the introduction of author media games into educational process.

5. Research Methods

We conducted an experiment on the formation of innovative thinking, which involved 250 preschool children from ten municipal preschool educational institutions of Togliatti. In the process of experimental work the following methods were used:

- diagnostics of the development of inventive thinking - N.V. Rubin;

- test of divergent (creative) thinking - F. Williams (Creativity Assessment Packet - CAP);
- methodology for diagnostics of children's research abilities development - A. I. Savenkov;
- children's questionnaire of L.V Kutsakova "Professional activities of adults."

As a result of complex diagnostics, the basic value of innovative thinking formation of preschool children was found (Table 01).

Table 01. The basic value of innovative thinking formation level of pre-schoolers

Indicator	Reference value (%)
1. The proportion of children aged between 5 to 7 years old who have an average and high level of formation of innovative thinking, including those who have:	25,0
- medium and high level of inventive thinking;	21,0
- medium and high level of formation of creative potential (creativity) and research skills;	28,0
- medium and high level of readiness for vocational orientation.	30,0

The second stage of experimental work, in accordance with the Federal State Educational Standards of Preschool Education and innovative thinking development stage, included the task of gaining experience by a child in the following activities:

- game (computer didactic games: plot, role-playing, etc.);
- communication (constructive communication and interaction with adults and peers; dialogue and monologue speech as the main means of communication in gaming activities);
- cognitive research (acquaintance and study of the surrounding reality and its individual objects).

Approaches used in the process of formation of innovative thinking that make it particularly powerful, and that included the requirement not only of knowledge and understanding of the studied area, but also the willingness to question information to doubt and not be limited to existing knowledge, the purpose of which was to deepen and expand training. Learners need to understand how they can question or challenge the knowledge they have acquired, and it is important for the teacher to help them formulate their own understanding. Considering the fact that there is nothing in the intellect that would not have previously passed through the senses (Leontiev, 2010), an important role is assigned to imagination and positive-emotional mood of a child. Besides, care for the emotional well-being of each child is one of the main functions of a preschool educational institution (Zinovieva, 2017).

Let's indicate some approaches that a teacher can use in the process of formation of innovative thinking of trainees:

1. Openness to "random" thoughts and the inadmissibility of ignoring the thoughts expressed by trainees.
2. The absence of "censorship" on the statements of children (this interrupts the creative flow).
3. Inspiration of trainees to think outside the box.
4. The value of each individual idea.
5. The creation of the "thought box", where anyone can put in their ideas.

The specified approaches promote overcoming barriers of innovative thinking among which are: fear to be seemed as "black sheep", to seem ridiculous; lack of self-confidence, fear to openly speak your own ideas (Mamadaliyev, 2012).

Let's give a description of the developed author educational and methodical complex "The Land of Learning Games", designed for children of middle and senior preschool age. It includes:

1. Electronic manual, made in the Power Point program and containing 4 blocks of media games aimed at the formation of the structural components of innovative thinking: creative potential (creativity), communicative thinking, skills of research behaviour, logical thinking. According to the new requirements of the Federal State Educational Standards, the introduction of innovative technologies is intended, above all, to improve the quality of education, increase the motivation of children to acquire new knowledge, and accelerate the process of learning.

2. Methodological manual, including a systematized material, revealing the content, the distinctive features of the methodology for the formation of innovative thinking of children. The task of the methodological manual is to provide practical assistance to teachers and methodologists of pre-school educational institutions in acquiring and mastering both theoretical and practical knowledge.

The expected result:

For trainee of preschool educational institutions:

- to show interest for new, unknown things;
- to independently search for information;
- to independently or together with pedagogues or parents find non-traditional solutions for one or other problem;
- to form and present his/her own point of view.

For pedagogues of preschool educational institutions:

- to master the experience of innovative thinking formation of pre-schoolers: learn to identify and develop the creative potential of pupils, their communication skills, research skills and logical thinking; master technologies that allow not only actively use media games in the educational process, but also develop them.

At the third, control stage of experimental work, re-diagnostics of the formation level of innovative thinking of preschool children was carried out.

6. Findings

The results of introduction of media games in educational process of preschool educational institutions are shown in Table 02.

Table 02. The level of innovative thinking formation of pre-schoolers at the control stage

Indicator	Reference value (%)
1. The proportion of children aged between 5 to 7 years old who have an average and high level of formation of innovative thinking, including those who have:	45.0
▪ medium and high level of inventive thinking;	40.0

<ul style="list-style-type: none"> ▪ medium and high level of formation of creative potential (creativity) and research skills; ▪ medium and high level of readiness for vocational orientation. 	43.0 50.0
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The analysis of the table shows that:

- the number of pupils of preschool educational institutions with average and high level of inventive thinking has increased by 19%, which proves the effectiveness of the technique used;
- the proportion of pupils of preschool institutions aged 5 to 7 years old with average and high level of creative potential formation (creativity) and research skills has increased by 15% from the initial level.
- in addition, the indicator of readiness for professional orientation has increased from 30% to 50%.

In general, the level of formation of innovative thinking among pupils has increased by 20% relative to the diagnostic stage.

7. Conclusion

The practical significance of the experimental activity is to increase the level of formation of innovative thinking of preschool children, as well as the fact that the content of the activity contributes to the solution of modern educational problems.

In particular:

- play activity, as the leading activity for preschool age, contributes to the preservation and support of the child's individuality, the development of individual abilities and creative potential of each child as a subject of relationships with people, the world and himself;
- game content aimed at finding, discovering, creating something new, developing creative potential (creativity) and research skills, developing readiness for vocational guidance, contributes to the formation of a common culture of pupils, development of their moral, intellectual qualities, initiative, independence and responsibility, as well as the formation of prerequisites for educational activities;
- the introduction of computer-educational didactic games into the educational process of preschool educational institutions ensures the variability and diversity of educational programs content and organizational forms of pre-school education level, the possibility of forming educational programs of various levels of complexity and focus, taking into account the educational needs and abilities of pupils.

The use of media games in the educational process of preschool children provides a number of advantages for the teacher:

- media games on an interactive board allow to fully realize the principle of visibility;
- a variety of colours allows to highlight important areas and draw attention to it, connect common ideas or show their differences and demonstrate the course of thinking.

As a result, pre-schoolers develop creativity and independence, the understanding of complex material is getting easier, as its presentation becomes clearer, more illustrative, and interesting.

The novelty of the complex of computer didactic games developed in the course of experimental work consists in the new approach to the process of formation of innovative thinking of preschool children, based on computer games, when the material is presented in a game form, and solution to one or another problem is found in the course of games, and at the same time innovative skills of children are formed.

The conducted experimental work showed the effectiveness of innovative thinking formation of preschoolers based on the developed author educational and methodological complex and socio-pedagogical measurement of the innovative concept of “individual development trajectory - creative thinking of children - educational environment”, which allowed to formulate ways to further improve and deepen the process.

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