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DEVELOPMENT OF CREATIVITY IN THE EDUCATIONAL PROCESS IN BIOLOGY

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Abstract

The article focuses on the formation of creative abilities in schoolchildren, the socialization of schoolchildren, the process of intellectual, creative and spiritual development in teaching biology, the development of creative activity of students, its role and significance in educational practice.

Keywords: Creativity, Creative Ability, Developing Creativity, Creative Activity, Formation of Creativity.

Due to significant changes in the economic, social, political and cultural life of our country, the role of activity, initiative, and the development of internal forces of a person who is able to make decisions independently, organize his actions to achieve goals, and who is able to solve problems creatively is increasing. The priority tasks of the theory and methodology of teaching and educating biology, school biological education include the problems of formation and development of creative personalities who are ready for self-development, self-education, and perception of innovative ideas, to create their own innovative projects and creative products in different spheres of individual and social activity in the future. Therefore, one of the tasks of school biological education is the upbringing of a creatively active personality. It is easier for an active student to learn, they learn social experience faster and more successfully, they develop communicative abilities, and a personal position towards the world is formed. The inclusion of schoolchildren in creative activities has a positive impact on the personality: her thinking, abilities, and creative activity develop.

The relevance of the formation of creative cognitive activity is socially significant, since it is the driving force of social progress; it is significant for the graduate, since it equips him with the experience of creative activity in the process of studying and preserving his health. It is personally in demand, as it leads to self-actualization, self-realization [2].

"Creativity" is a relatively new term that appeared in psychology and pedagogy in the early 60s of the twentieth century. It was then that creativity was singled out by foreign researchers as an independent personality trait.

Creativity, the ability to create is recognized as one of the most important competencies. In accordance with this trend and the mission of general biological education, the problem of developing the creative abilities of students in biological education is being actualized [4].

Theories and methods of teaching and educating biology, school biological education include the problems of formation and development of creative personalities. The content of the biology teaching material contains large and not yet fully disclosed opportunities for the development of students' creative abilities.

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An important component of creative abilities is divergent thinking, defined as a type of thinking aimed at finding multiple solutions to a problem, the main characteristics of which are flexibility of thought, fluency of thought and originality [1].

According to the theory of the development of abilities proposed by S.L. Rubinstein, abilities develop in a spiral. An important link in this process is the realization of the student's capabilities through practical activity. Based on the activity, a new level of development of abilities is formed, which is used for the next cycle of realization of opportunities. Consequently, for the successful development of creative abilities in the educational process in biology, students must be regularly provided with opportunities for creative activity.

For a biology teacher, when working with students, the problem of motivation is extremely important. The development of creative abilities is impossible without the internal motivation of students. Methodological conditions for maintaining the motivation of students when performing creative tasks in biology are: cooperation of the teacher with the student and the use of his life experience; joint search with the teacher for answers, contradictions and new questions; the use of works of fiction, fine art and music; work in mini-groups on the implementation of problematic tasks; modeling of biological processes; creative projects; using the links of biology with other sciences [3].

When teaching biology, in order to develop the ability to be creative, an educational environment specially organized by the teacher together with the students is necessary, which represents the resources provided by the environment and factors that allow turning the inner potential of the individual into a really demonstrated creative behavior. The main components of such an educational environment are psychological safety, the possibility of flexible use of space and time, the use of various teaching methods, informative feedback. Such an educational environment is possible with a combination of lessons and extracurricular activities with the voluntary participation of students, the absence of strict regulations of study time and a variety of activities with elements of creativity [6].

The development of students' creative abilities is influenced by the existing attitude towards results in some educational organizations, which negatively affects the desire of students to research. At the same time, the personality of the teacher, his creative behavior is of particular importance for the development of creative abilities, and in this case, imitation of the teacher becomes a mechanism for the development of creativity [5].

The methodology is focused on regular and extracurricular educational activities in their close relationship and represents one of the possible options for the development of creative abilities of students in biology. Structurally, the methodology for the development of students' creative abilities in the educational process in biology includes the following interrelated and interdependent components: principles of the organization of the process of developing students' creative abilities in the study of biology; teaching methods; methodological techniques for the development of creative thinking; the list of skills, the development of which determines the essence of creative abilities; requirements for the compilation and content of creative tasks in biology; a set of creative tasks in biology; methodological conditions of the

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educational environment necessary for the development of creative abilities of students in the study of biology; principles of evaluating the results of creative activity of students in biology [7].

The principles of organizing the process of developing students' creative abilities are the main starting points necessary to achieve the development of creative abilities in the educational process in biology and can be called the principles of the development of creative abilities. They relate to the setting and organization of the lesson as a whole. Compliance with the principles of the development of creative abilities seems to us a necessary condition for the full realization of the potential inherent in methods and techniques. Among such principles we have included priority of creative activity, priority of biological content, combination of creative and reproductive activities, consideration of individual needs and interests of students, priority of independent activity of students, not imposing their opinion by the teacher, cooperation and cooperation, respect for the right of students to make mistakes.

The experimental methodology of teaching biology to reveal the creative potential of students involves the use of research and project activities, modeling, problem presentation, and visualization, heuristic and game methods. They are used in combination with stimulating divergent thinking techniques of "brainstorming", construction of metaphors and analogies, morphological synthesis. For example, in the educational process of biology, the use of "brainstorming" is advisable if students are faced with a task that requires the search for many solutions, or a problem that does not have one correct answer. The use of this technique involves three mandatory stages: problem statement, idea generation, selection and evaluation of ideas. The main principles of brainstorming are the emphasis on the number of ideas, the absence of evaluation and criticism of ideas, and the initial acceptance of any ideas as valuable and significant.

An important part of the experimental methodology is the skills determined in the course of the study, which form the basis of creative abilities: highlight the main idea of the text and systematize information; find cause-and-effect relationships; transfer knowledge to a new situation; find alternative solutions; see the problem; find contradictions; ask questions; hypothesize and argue; plan your actions. The improvement of these skills in the process of creative activity serves as an indicator of the development of creative abilities in the student in the educational process of biology.

The methodological conditions of the educational environment that promotes the creativity of students can be divided into three groups. The first group includes the conditions provided by the teacher: a friendly, free atmosphere; maintaining motivation and self-esteem of students; developing interest in biology; taking into account age characteristics; prompting to ask questions. The second group includes conditions related to the activities of students: students express non-standard ideas; are ready for situations of uncertainty; demonstrate flexibility in thinking and activity; show perseverance in finding new ideas; they strive to study all possible options; apply divergent thinking techniques. The third group of conditions is related to teaching methods and includes flexible use of space and time; variation of teaching methods, the use of reflection. These groups of conditions are interrelated, since the behavior and activity

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of students largely depends on the work of the teacher.

As one of the priority directions of modernization of Uzbek education, it identifies the development of personality, its creative abilities and creative cognitive activity. Modern society is interested in individuals who independently make decisions in a situation of choice, who have a need to expand and deepen their knowledge, who are able to live and work creatively, critically approach their own and others' ideas. In this regard, the problem of developing creative cognitive activity of schoolchildren is relevant in the methodology of teaching biology courses and is associated with the definition of methodological conditions for teaching biology that stimulate students to search for more rational non-standard solutions, increase their creative activity, develop observation, independence, creative thinking and imagination.

This can be achieved by systematic use of creative cognitive tasks, observations and experiments, modeling, game situations in the classroom, the search for solutions to which develops the imagination and imagination of schoolchildren, activates their cognitive activity and increases interest in the subject.

In the developed methodology, creative tasks in biology act as a means of developing the creative abilities of students. With the help of these tasks, students gain experience in creative activity. Creative tasks are characterized by the fact that in the course of their solution, the skills and abilities peculiar to creative personalities are gradually formed. Skills based on knowledge and skills, the development of which involves mental operations and psychological processes, constitute a complex phenomenon of creative abilities. The choice of skills that determine the creative abilities of students in the educational process in biology was carried out on the basis of an analysis of the state of the problem under study in science, educational practice and their own professional activity as a biology teacher.

Students' creative thinking is aimed at solving problems. This function of thinking is realized in the process of solving creative tasks.

We consider creative biology tasks used in the classroom and for homework as a type of creative activity of schoolchildren in the learning process. Solving creative tasks requires students to have a deeper understanding of the studied material, rejection of ready-made standard solutions, flexibility of thinking, analysis of their life experience, active search activity, as a result of which the connection of the studied with already known facts and its critical evaluation is established [9].

In the educational process of biology, the experimental orientation of the task is preferred. When solving a creative task in biology, students interact with specific natural objects or independently conduct experiments, which gives the task an experimental character.

In order to meet the interests of students, creative tasks in biology should be entertaining, contain some contradiction, even a paradox, and arouse genuine interest among students of the appropriate age group.

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1. Includes the conditions provided by the teacher: a friendly, free environment, organization of motivation and self-esteem of students, development of interest in biology; ask questions taking into account age characteristics.
2. Includes conditions related to students' activities: students express non-standard ideas, prepare for uncertain situations, demonstrate flexibility of thinking and action, show perseverance in finding new ideas, everyone strives to explore possible options using divergent thinking.
3. It is related to teaching methods, includes the correct definition and use of space and time, and provides a variety of teaching methods. These conditions are interrelated, since the behavior and activity of students largely depend on the work of the teacher [9].

The skills that form the basis of creative abilities include highlighting the main idea of the text and systematization of information, finding cause-and-effect relationships, transferring knowledge to a new situation, finding alternative solutions, seeing the problem and finding contradictions, including posing questions, hypothesizing and arguing, and planning actions. The improvement of these skills in the process of creative activity serves as an indicator of the development of a student's creative abilities in the process of studying biology.

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