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Ways To Develop Creative Skills Of Students In Science Education

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Annotation

In our country, a lot of reforms are being carried out by the educational system management bodies in order to achieve high indicators of educational processes in general education institutions. The formation and development of students as creative individuals depends on the mutual compatibility of changes in their internal and external world, socio-economic conditions, and the implementation of tasks aimed at increasing their creative qualities in educational processes.

These practical activities create the need for students to achieve new achievements, move forward to a certain extent, help to develop their learning abilities to some extent. In particular, in the education of natural sciences (SCIENCE), it is possible to achieve a high level of mastery of this science by developing creativity, development of new ideas, and pursuit of innovations.

Keywords: educational system, natural science education, creativity, creative qualities, creative ability, pedagogical thinking, creative environment, creative thinking, creativity, personal creativity qualities.

The future of every society is determined by the level of development of the education system, which is an integral part of it and a vital necessity. Today, the fundamental reform and improvement of the continuous education system of our country, which is on the path of independent development, raising it to a new level of quality, introducing advanced pedagogical and information technologies into it, and increasing the effectiveness of education have been raised to the level of state policy. In particular, with the adoption of the newly revised Law "On Education" [1], it is a proof that special attention is being paid to educating students who are mature in all

aspects, who can compete with the youth of the most developed countries of the world, who can think creatively through the continuous education system.

In the Decree No. PF-60 of the Honorable President of January 28, 2022 "On the Development Strategy of New Uzbekistan for the period of 2022-2026" [2] and other regulatory legal documents related to this field, improvement of the education system and thereby the creative qualities of students priority tasks aimed at formation have been defined.

It is urgent to organize the processes of natural science education in all general education institutions in our republic based on the requirements of the times, to introduce the most advanced innovative technologies and thereby achieve the quality and efficiency of education. In this place, the development of creative qualities of students, development of strategies and tools that serve to stimulate creative thinking and creative activity results is of particular importance. Creativity (lat., ing. "create" - creation, "creative" - creator) is the creative ability of an individual that describes the readiness to produce new ideas and is part of talent as an independent factor.

A person's creativity is manifested in his thinking, communication, feelings, and certain types of activities. Creativity describes a person as a whole or his specific characteristics. Creativity is also reflected as an important factor of talent. Also, creativity determines mental sharpness, ensures active involvement of students' attention in educational processes. In recent years, in the educational system of developed foreign countries, special attention has been paid to the issue of formation and development of students' creativity.

Including Merriman (2010), Bronson, Fisher, Frey (2008), Ken Robinson (2007), Begetto, Kaufman (2013), Ali (2011), Treffinger (2008) can be seen in many studies conducted by scientists such as

According to Ken Robinson, "creativity is a set of original ideas that have value." And Gardner explains this concept in his research: "creativity is a practical action performed by a person, which should reflect a certain novelty and have a certain practical value." According to Emebayle (1989) approach, creativity means "the possession of highly unusual skills along with thorough knowledge of a specific field" [3].

Some studies have different views on the relationship between intelligence and creativity. One group of researchers claims that there is no connection between them, while the representatives of the second group claim that the level of creativity and intelligence are related to each other. The concept of "creativity" reflects cultural diversity. For Westerners, creativity is generally considered a novelty. They emphasize that creativity is based on unconventionality, curiosity, imagination, sense of humor, and freedom (Murdoch, Ganim, 1993; Sternberg, 1985).

Easterners, on the other hand, understand creativity as a process of rebirth of goodness (Hui, Sternberg, 2002; Rudovich, Hui, 1997; Rudovich, Yue, 2000). Although Westerners and Easterners have different views on creativity,

representatives of both cultures highly value this quality and its ownership (Kaufman, Lan, 2012) [3].

Like any other quality (virtue), creativity is not formed suddenly. Creativity is consistently developed in certain stages. So, when do the characteristics of creativity appear in a person's work? Although creativity is often visible in the student's work, this situation does not guarantee that students will achieve creative achievements in the future. It only represents the possibility that they need to master this or that creative skill. It is necessary to pay attention to the following in the development of students' creativity in natural science education:

1) encourage them to ask a lot of questions and support this habit;

2) encouraging students' independence and increasing their responsibility;

3) creating an opportunity for students to organize independent activities;

4) focus on students' interests

Researcher N. Fayzullaeva believes that in order to have a pedagogical mindset, learners should be able to acquire the following skills and qualifications based on a thorough study of pedagogic knowledge: knowledge of the main ideas, concepts, laws of pedagogy and development laws of pedagogical phenomena; to know the most important theoretical ideas, basic categories and concepts of pedagogy; knowledge of basic pedagogical facts; acquisition of practical knowledge about the general method of education and upbringing [4].

In psychology, E.P. Torrens developed a test that determines the creativity of a person. According to E.P. Torrens, personal creativity shows the following signs:

a) not to ignore questions, shortcomings and conflicting information;

b) trying to identify problems, trying to find their solution based on the assumptions made.

According to scientists, it is necessary to create a comfortable creative environment in the classroom before students can develop creative thinking skills. Students studying in a creative environment gradually increase their interest and motivation to perform creative tasks, and also tend to think creatively as a result of observing a teacher with a creative mindset. A creative learning environment leads to the development of critical and creative thinking skills, which are of great importance in the educational process [5].

Characteristics of students with creative abilities are:

- they express ideas that have not occurred to other students;
- chooses a unique style of self-expression;
- sometimes asks unrelated or unusual questions;
- enjoys open-ended tasks;
- prefers to discuss ideas based on clear evidence;
- chooses an unconventional approach to finding a solution to a problem.

As mentioned above, the qualities of creativity in students do not develop by themselves. According to this research, a number of ways to successfully develop creative qualities in a person are highlighted. Patti Drepeau [5] has shown several ways

to successfully develop the qualities of creativity in a person. There are factors that hinder the development of students' creative qualities and skills. Therefore, teachers should focus on eliminating these factors in educational processes.

The following factors hinder the development of creativity in a person:

1) avoiding risk;

2) allow rudeness in thinking and behavior;

3) underestimation of personal fantasy and imagination;

4) subordination to others;

5) think only of success in any case.

In the teaching of natural sciences, it is necessary to create the necessary conditions for the formation and development of students' creative thinking skills, so that they can work as a team or in small groups. After all, there is an opportunity to creatively develop any expressed opinion.

In order to teach students to think creatively in science education, to increase their natural-scientific literacy, to be able to form creative thinking, first of all, the teacher of natural sciences must be a creative person with a creative mind. However, if he himself does not possess the qualities of creativity, he cannot encourage students to think creatively. In science education, the teacher moves in the following four directions according to the "creativity road map", and the actions in them are considered to be signs of the creativity of pedagogues:

1) demonstration of creative thinking skills;

2) to be able to use strategies that encourage students to learn natural sciences with interest;

3) Innovative approaches to natural sciences and a creative approach to finding solutions to pedagogical issues;

4) expected result.

The creative potential of a teacher is a multi-level process and it is based on the following principles:

1. Having a problematic character
2. Increasing opportunities
3. Bright manifestation of creativity
4. Creative orientation
5. Achieving individuality
6. Integrity, consistency, systematicity
7. Mutual harmony of individual characteristics of a person and qualities acquired in life [7].

Therefore, creativity "is clearly manifested in making decisions on issues related to education and training in various situations, and it describes the creative activity of the pedagogue [9].

In conclusion, it can be said that identifying, forming and developing students' creative abilities in the teaching of natural sciences helps them to understand the nature and society relations, to form the right attitude to the environment, and to

understand the issues of rational and economical use of natural resources. For this, it is not necessary for the teacher of natural sciences to be creative and creative or not, but to organize lessons in the spirit of creativity and creativity, to try new ideas in the educational process.

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