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## CHARACTERISTICS OF RESEARCH ABILITY IN BACHELOR CHEMISTRY STUDENTS

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### Annotation

This article describes how to form and develop the research skills of chemistry students, and how to gradually guide students to promising research.

The main feature of the formation and development of research skills is the growth of the student's educational problems and personal interest in the profession, the accumulation of educational experience as an element of professional experience, the ability to work independently.

**Keywords:** research ability, research skills, intellectual potential, professional competence, vocational education.

Nurturing well-rounded, intellectually gifted youth has become one of the urgent tasks of today. To this end, our country has introduced the use of world-class material and technical base and advanced forms of educational technology at all stages of the current education system. However, a deeper study of the laws of psychological development of future teachers, the identification of the intellectual potential of each of them in the form of abilities, talents and abilities, and the individualization of the educational process based on these opportunities are organized at the level of modern requirements. can not be considered. According to the results of psychological research of a social nature, the further development of the work of educating talented and intellectually gifted future professionals is largely due to the fact that teachers and the general public understand the essence of psychological terms. it is also inextricably linked with their understanding of the laws of development on a scientific basis. When those in charge of education do not yet have sufficient explanations of abilities or intellectual potential and related terms (ability, talent, ability, talent, genius, genius, darga),

should not be inferred. In particular, it includes ability - the ability to do something, the ability to do something, the ability to accomplish; Talent - power, might, might; Ability - ability, suitability for a job; ability to do something, ability to do, ability; Talent - creative ability, ability, talent; Talent - great ability, talent; Genius - incomparably talented, intelligent; A genius is a person who is described as a wise, intelligent leader with extraordinary intelligence, who can satisfy learners to some degree or in some sense. However, this cannot be explained from a scientific and psychological point of view. For such chemist students, it is desirable to improve and individualize the educational process, taking into account their capabilities and characteristics. Ability is an individual psychological trait that arises in the dynamics of the acquisition of knowledge, skills and abilities, which is a condition for the successful implementation of this activity. Ability is the ability to perform a task or problem more easily and efficiently than other people. The choice of a specific topic in the formation and development of research skills of chemistry students is a scientific matter that covers a specific area of research. It is based

on many research issues - much smaller scientific issues related to a specific area of the problem. In solving a problem or problem, a specific research task is solved, for example, the development of new material, construction, the creation of advanced technologies. In this case, their implementation is not only of theoretical importance, but also of practical importance, with a certain high efficiency, which is mainly expected. Choosing a problem and topic is a difficult and responsible task that can be solved in several stages. -In the first stage, based on the content of the problem, the solution is expressed and the expected result is determined in general. - In the second stage, the urgency of the problem, its importance for science and technology is determined. -In the third stage, the problem structure is developed, the topic, sub-topics, questions and the relationship between them are different. Incorporating problem-solving into the learning process allows to solve the following didactic bases of education; -ensure the independence and activity of students; - Achieving knowledge stability, knowledge and ingenuity. In the process of solving the problem - the basic concepts of chemistry, laws and atomic structure, substances and their structure, the concept of various chemical processes are strengthened, and the ingenuity in the use of knowledge is formed. In addition to shooting, the ability to work independently on learning materials will also increase.

When chemical problems are organized correctly and interestingly, not only students, but also high school and college students are taught such qualities as diligence, purposefulness, inquisitiveness, responsibility, perseverance and perseverance in achieving the set goal. So far, there is no single universal method for solving all chemical problems, and it is unlikely that such a method will be

developed, because to solve each problem requires a separate approach, depending on the conditions given in it. In the general classification, chemical problems are divided into 2 main groups; 1. Computational (quantitative) issues; 2. Qualitative (qualitative) issues. When solving problems in such groups, the following should be taken into account; -read carefully the conditions of the problem, understand its essence; -write a plan for the analysis and solution of the given conditions using the values in the chemical part of the problem; -choose the most appropriate and correct method of solving; - mathematical part of the solution, perform the necessary calculations; -write the answer to the question and check the result; In short, the key to developing students' problem-solving skills and curiosity is to organize problem-solving in all chemistry classes, from easy to difficult. As a result, a problem tree is formed during the lesson. Choosing a topic is often more difficult than conducting research. Talent is an association of skills that enables a person to perform complex labor activities successfully, independently and in an original way. A genius can be understood, for example, as a genius mathematician or a genius poet. Such people have a high level of intelligence based on a perfect mastery of this science, they will be able to apply the conclusions of this science to all aspects of life, and they are spiritually capable of making great discoveries in this science. Geniuses, geniuses or saints - not people with "extraordinary" intelligence, who can think clearly not only in one or a few disciplines, but even in all disciplines, who have a deep understanding of the most general laws of nature, society and human thought in general, and act wisely based on it . In short, the effectiveness of any work depends on a thorough understanding of its essence and the physical and psychological guidelines for its



skillful implementation before starting it. This, of course, is solved based on the intellectual capacity inherent in the ability of the person performing the task. Theories about the transmission of abilities from one generation to the next contradict scientific theories. The mental development of each person, including the growth of the intellectual potential inherent in his abilities, is governed by socio-historical laws. Awakening of ability depends on social conditions and is initially reflected in the needs, interests and orientations of the student. Therefore, in order to cultivate the abilities and intellectual potential of students, it is necessary for teachers and other educators to know the laws of intellectual development of young people and their specific development, and to organize the educational process in a rational manner. The main purpose of vocational education and skills in higher education is to create conditions for the involvement of students in active educational activities, in particular, the development of the scientific potential of the student's personality and social flexibility, self-development and self-realization. allows you to form a learning, competitive profession. The student's research skills demonstrate his or her deep learning and professional motivations, aspirations, and constant interest in future careers, as well as his or her unique focus on the teaching profession as a value, responsibility, and professional duty. Understanding this importance of research skills allows students to consider the importance of being able to choose easy solutions, thinking about where to start solving problems in chemistry as they gradually join prospective research. activities expand, intellectual and cognitive skills, communication skills, and values for society develop.

The formation of the student-researcher takes place in the process of joint work and

communication with the research supervisor and other participants of the activity. The student learns the basics of science, methods and principles of scientific work, the values of scientific research are determined. In the process of conducting research, various difficulties are overcome, solutions are sought, research contradictions are resolved, choices are made, decisions are made, and as a result, the individual develops with his character and values. During the activity phase, students learn to set goals and objectives, formulate a problem, research subject and object, choose research methods, plan research, analyze, synthesize, generalize, find and build proof methods. We create special pedagogical conditions that allow not only to develop students' research skills, but also to identify and shape the future professional personality of the future student and their relationship to this profession. Thus, the right choice in problem solving, information retrieval, creative, problem-solving tasks successfully form and develop independent thinking skills. Collaborative preparation of teachers and prospective students for research and creative projects helps to develop students' skills of assessment and reflective analysis of activities, critical comprehension of information. More than half of the students (55%) associate their future with their chosen profession and plan their activities as a chemistry teacher, 67% have specific features of science, high level of personal responsibility (56%), have clear views on the need for constant self-improvement and personal self-management (69%).). This rule was a strong positive basis for the development of research skills of chemistry students. At the final stage of the research, it was important for us to determine: whether the students of the specialty of chemistry have changed their ideas about the self-organization of the educational process, to





record their achievements and whether he learned to evaluate problem-solving skills in science, found optimal ways to achieve a successful outcome, and made information choices appropriate to his professional future. The results showed that the number of students making independent decisions increased from 50% to 64%. At the study stage, only 36 percent of the students were able to conduct research activities, while at the formation stage, 64 percent of the respondents stated their skills in this work.

Thus, the involvement of first-year students in student research allows them to understand and evaluate some aspects of future professional activity from theoretical positions. Prospective chemists graduating from higher education are constantly improving the way they teach chemistry in school. Today, the acquisition of knowledge in other disciplines, the transition from easy to difficult problem-solving in the teaching of chemistry, the search for easy solutions to problems, the elimination of various difficulties in the process of research, solutions are sought, research conflicts are resolved, the choice, the decision is made and as a result the person needs to be with his character and value orientation, which will succeed in training a competent specialist in the labor market. Thus, the development of students' intellectual potential is the main task of quality training of the future competent specialist in the technical university. At the same time, improving the teaching of chemistry is impossible without organizing a holistic process of intellectual development, which allows students to penetrate the essence of the material studied, gain experience in mental activity and use the acquired knowledge as a tool for further development.

The following identified contradictions should be taken into account when teaching chemistry

to chemists: between the increasing demands on the quality of chemical knowledge and skills, the low level of development of intellectual abilities of future professionals and modern students; between the need to acquire fundamental chemical knowledge, the development of intellectual abilities is not carried out in a purposeful manner, and the established practice of teaching chemistry in universities; the lack of a methodology for organizing this process in a technical university with the natural needs of students in the development of intellectual abilities makes it worse than the evolving potential of the chemical sciences. In conclusion, scientific research is a creative cognitive activity, which is related to the development of scientific knowledge, the acquisition and application of new knowledge, the new laws and principles of scientific knowledge, the creation of innovations in various fields. 'liqdir. The modern talented scientist is a highly cultured, intelligent person, deeply educated, a perfect person who approaches every work by creativity. The main tasks of scientific research are: - to teach students to apply the acquired knowledge in their research and practical activities, to develop creative thinking on worldviews and scientific problems in science, scientific thinking and creativity; - to provide a deeper understanding of the dialectical relationship of philosophy and economic theory on the basis of the methodology of scientific knowledge; - be able to creatively apply new methods and approaches to scientific knowledge; - It is important to know the importance and role of modern information systems and technologies in scientific research, independent thinking, creative approach to research and collection of scientific materials.

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