

**FaR 2021**

**International Forum “Freedom and responsibility in pivotal times”**

**INCREASING THE LEVEL OF FORMATION OF EDUCATIONAL  
MOTIVATION AND INDEPENDENCE OF STUDENTS**

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**Abstract**

Interest in learning activities and in the learning process itself, understanding of the learning material can only be formed by using active, creative teaching methods. The research considers the use of practice-oriented tasks in teaching disciplines of the natural science cycle. In order to form and activate the interest of students in the study of natural sciences, it is necessary to model production problem situations that are solved with the help of universal educational actions obtained in the classroom-The study distinguished two personal qualities of students, which prevail over others when considering the learning process; they are educational motivation and cognitive independence. It is necessary not only to form these qualities, but also to activate them in every possible way in the learning process for the successful mastering of knowledge and skills that will be useful to the future specialist in his professional activities. The results of the study confirmed that the use of practice-oriented tasks in the study of the disciplines of the natural science cycle has a positive effect on the formation and activation of students' learning motivation and it contributes to an increase in the level of the cognitive independence in training future specialists, that are necessary for the development of modern agricultural production. This fact will allow solving many personnel problems in the agro-industrial complex in the future.

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*Keywords:* Education, students, practice-oriented tasks, educational motivation, cognitive independence, natural science education



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## 1. Introduction

The society makes an important requirement for the training results of university graduates - a broad scientific worldview, which is based on solid knowledge and the readiness to apply the knowledge and skills acquired at the university in their life. To implement this requirement, it is necessary to develop in students such qualities as independence, activity, etc., which are important both for mastering solid scientific knowledge and for choosing a stable life position. Therefore, it is so important to form a student's stable motivation for learning and the correctness of the chosen profession.

The level and style of scientific thinking determines natural science education. It is knowledge of this cycle of disciplines that helps a student to realize his place in the world, in nature.

This knowledge "... most fully demonstrate the ability of the human mind to analyze any incomprehensible situation, identify its fundamental, qualitative and quantitative aspects and bring the level of understanding to the possibility of theoretical prediction of character and results its development in time. Natural science education is one of the components of preparing the younger generation for an independent life". (Khasanova, 2017, pp. 158-162)

Today, such a direction of educational practice as practice-oriented tasks, and not only in professionally oriented disciplines, but also in natural sciences, is acquiring great importance. Such tasks make it possible to increase the motivation of students for learning, for independence and activity in immersion and mastery of the chosen profession. Thus, the relevance of the topic we are considering is beyond doubt.

## 2. Problem Statement

The study distinguished two personal qualities of students, which prevail over others when considering the learning process; they are educational motivation and cognitive independence. It is necessary not only to form these qualities, but also to activate them in every possible way in the learning process for the successful mastering of knowledge and skills that will be useful to the future specialist in his professional activities.

## 3. Research Questions

The main feature of teaching natural sciences in an agricultural university, in our opinion, is the applied and practical orientation of education. Therefore, teachers and lectures try to organize work with students in such a way that the content of their activities in various types of work could have a positive impact on the formation of both educational and other types of motivation, as well as intensify the independent cognitive activity of students, aimed at obtaining solid professional knowledge and skills.

The applied orientation of natural science disciplines presupposes the orientation of the content of the taught disciplines towards a close connection with life situations, towards preparing students for the use of natural science knowledge in future professional activities. The practical orientation of natural science

disciplines provides for the orientation of the content and methods of teaching on the ability to apply theoretical knowledge to solve educational and practical problems, on the formation and activation of students' independence, on the ability to work with educational material and reference literature, on fostering sustainable interest in the subject under study. Applied and practical directions are interconnected in the educational process. Practice shows that students are more interested in solving problems of practical content. Educational motivation to study the discipline is clearly manifested when students observe how a theoretical problem arises from a practical problem, and vice versa, when a theoretical problem can be given a practical orientation (Dolgova et al., 2019; Kondaurova & Filipovich, 2019).

In addition to enhancing motivation for learning, such tasks help to activate the cognitive independence of students. The student's cognitive independence is understood as the personality quality, which is expressed in the student's ability to organize his cognitive activity himself (or with the help of a teacher) and carry it out to solve a new cognitive problem, as well as, using volitional efforts, to master knowledge and methods of activity that are expressed in readiness to solve cognitive tasks, i.e. determine the goals of the activity and correct them in a timely manner (Filipovich, 2006).

To increase the motivation for learning and independence of students, university teachers develop lectures, practical exercises, laboratory work, and other forms, which contribute to the implementation of a practice-oriented orientation in learning; work out tasks and tasks with practical content, reflecting the essence of agricultural production and implementing a practice-oriented approach to the study of natural science disciplines.

The method of projects, which ensures the development of cognitive motives and interests of students, conditions for creativity in teaching, successfully helps to implement a practice-oriented approach (Morgan, 2006).

The use of a practice-oriented approach is very important for students to master the demanded competencies, because the adaptation of students to real working conditions depends on practice. The result of applying a practice-oriented approach to teaching is a bachelor who is able to effectively apply practical competencies in practice. The essence of the practice-oriented approach is to bring the conditions of an educational institution closer to professional ones in order to form the competitiveness of a future professional through the acquisition of work experience and the acquisition of the necessary competencies. The practice-oriented approach successfully complements the competence-based approach, thereby creating an environment for the formation of independent, mobile students. The practice-oriented approach reflects the main processes of education modernization, in which the basis is the training of competent bachelors who are able to quickly adapt to the conditions of specific practical activities (Smirnova et al., 2019).

One of the main points in modern education is the need to strengthen the applied orientation, that is, the implementation of the connection between the theoretical content of the material and practical application in solving problems in all areas of activity, including professional activity. (Khaibullin et al., 2019). In the process of solving practice-oriented tasks, the ability to solve both standard and non-standard problems of a problematic nature is formed. Examples of tasks with practice-oriented content can be offered to students at various stages of training. At the stages of perception and comprehension of new material, such tasks convince students of the need to expand existing knowledge, they develop cognitive interest and

teach them to independently acquire the missing knowledge. When analyzing and solving such problems at the stages of consolidation and repetition of educational material, students learn to apply theoretical knowledge in practice. At the stage of verification, solving problems with production content allows you to establish the level and depth of assimilation of the studied material (Kondaurova & Filipovich, 2019).

In order to form and activate students' interest in the study of natural science disciplines, it is necessary to simulate production problem situations, which are solved with the help of the knowledge and skills acquired in the classroom. If students understand how they can practically apply the theoretical knowledge gained in the classroom in their professional activities, then the study of complex material becomes more understandable and interesting.

#### **4. Purpose of the Study**

The purpose of the work was to establish whether the use of practice-oriented tasks has an impact on the formation and activation of students' learning motivation and cognitive independence.

#### **5. Research Methods**

The article presents the data of the research conducted in the 2020-2021 academic year with students of the Kuzbass State Agricultural Academy of different areas of training.

In the process of work, the following methods were used:

- private research methods.
- The questionnaire "Educational motivation" adapted by us for work with students by G.A. Karpova and a test questionnaire by T.D. Dubovitskaya.
- Block of questionnaires by A.E. Bogoyavlenskaya. The purpose of the techniques is a comprehensive diagnosis of the formation of students' cognitive independence in all its components.

All the statistical data obtained were subjected to mathematical analysis in the Microsoft Office Excel program: calculation of averages, comparison of averages, percentage, correlation analysis.

#### **6. Findings**

The study was conducted on the basis of the Kuzbass State Agricultural Academy during the academic year of 2020-2021. The experiment involved 96 first-year students in various areas of training. The purpose of the work was to establish whether the use of practice-oriented tasks has an impact on the formation and activation of students' motivation for learning and cognitive independence.

At the ascertaining stage of the experiment with the help of the questionnaire "Educational motivation" G.A. Karpova, the motives of educational activity perceived by the students were identified at three levels: high, medium and low formation of educational motivation.

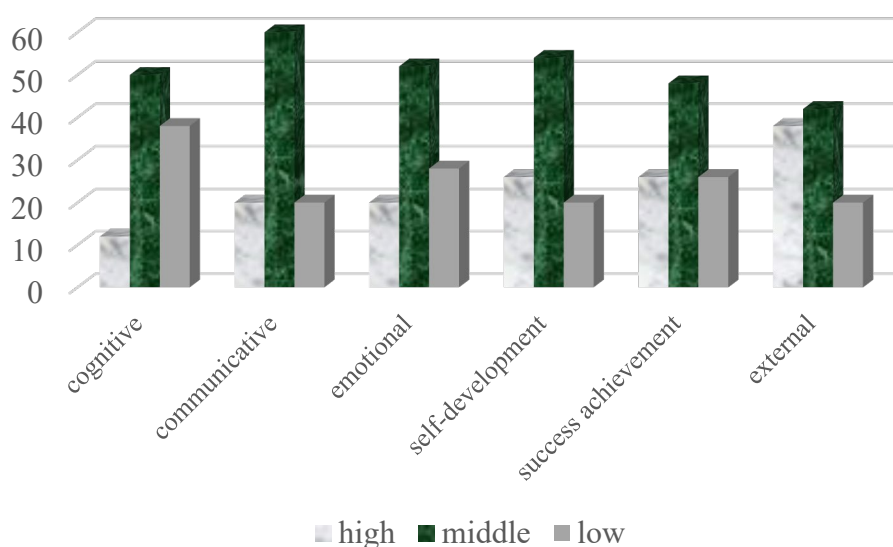
A high level of development of educational motivation is characteristic of students who consciously chose their profession; they consciously and responsibly treat their studies, fulfilling all the requirements of teachers. These students have good school preparation and therefore master the educational material

quite easily. They, as a rule, actively manifest themselves in independent work aimed at acquiring knowledge and practical skills.

Having average indicators of educational motivation, students master the educational material and are able to independently solve typical problems, but their cognitive motives are formed to a lesser extent, they are responsible, but the educational process practically does not attract them. These students have superficial knowledge that is quickly forgotten.

Students who showed a low level of development of educational motivation refer to the learning process either indifferently or negatively. As a rule, for such students the university choice and the training direction were made by their parents; students themselves are not interested in much. They have practically no motivation for learning and independence in acquiring knowledge.

The results of the survey are presented in Figure 01.



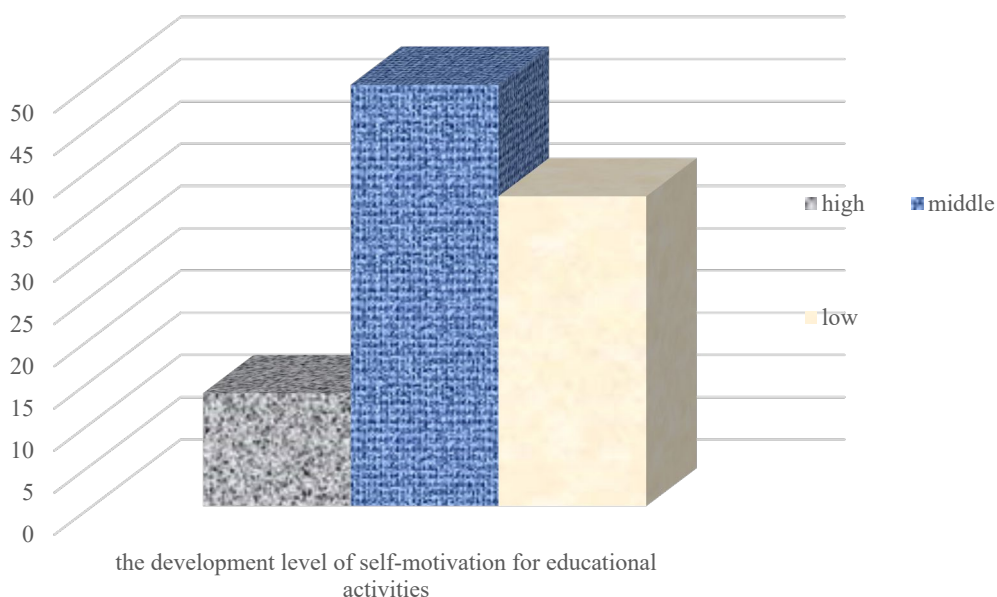
**Figure 1.** The results of ascertaining the development level of educational motivation of students in the Kuzbass State Agricultural Academy according to the method of G.A. Karpova

The development level of motives for learning activity for first-year students is very average. For them, communicative, emotional and the motive for achieving success are more important.

In order to determine the level of development of internal motivation for the educational activity of students in their study of natural sciences, there was used the methodology of T.D. Dubovitskaya.

At the ascertaining stage of the research, a small number of interviewed students (13.4%) showed a high level of development of intrinsic motivation for educational activity. This level is characterized by high cognitive activity in the classroom, the ability to find and use the necessary educational material, independence and responsibility in performing not only typical, but also tasks of increased complexity, a conscious understanding of the importance of natural science knowledge for solving professional problems in future professional activities. Middle results showed 49.9% of respondents. They are characterized by weak cognitive activity in the classroom, unwillingness to solve tasks of increased difficulty and difficulties in working with educational literature in the discipline. A low level is occupied by 37.7% of students who

do not have cognitive activity in the classroom. They express a negative attitude towards the subjects of the natural science cycle, explaining this by the fact that they did not understand them at school and at the university, and they take a passive position of "victim" and unwillingness to change the situation (Figure 02).



**Figure 2.** The development level of self-motivation for educational activities of students in the Kuzbass State Agricultural Academy according to the methodology of T.D. Dubovitskaya

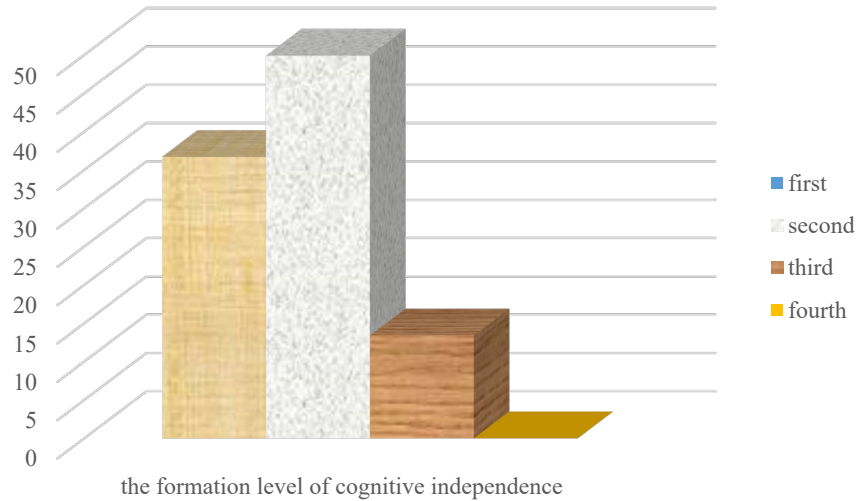
A large number of students are at a low level of development of intrinsic motivation, which gives us the right to speak about the need to activate intrinsic motivation for educational activities in the classroom of the disciplines of the natural science cycle.

Determining the level of cognitive independence, four levels of formation were identified. The first level (reproducing) is attributed to students with poor academic preparation in the subjects of the natural science cycle. They are able to perform tasks of the reproducing type according to the algorithm presented by a teacher. 36.7% of the respondents show this level of formation of cognitive independence. The second level (reconstructive-variable) assumes that students cope with tasks of the reconstructive-variable type. This group includes 49.9% of the students. Students who cope with solving tasks of a partial search type - this is the third level of formation of cognitive independence (13.4%). The fourth level, which involves solving tasks of a creative type, was not reached by any of the tested students (Figure 03).

The data of the ascertaining experiment allow drawing a conclusion about the correct choice of the research topic and the relevance of the experiment being carried out.

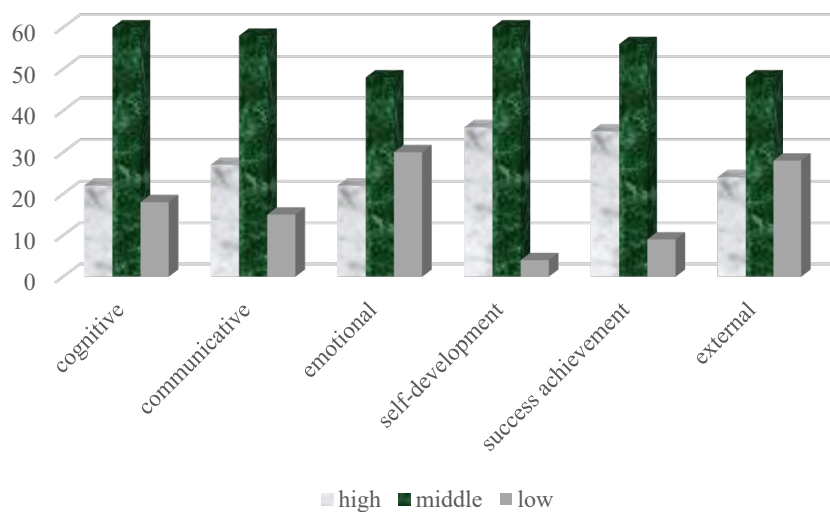
At the formative stage, in the classroom, the scientists used carefully selected practice-oriented tasks, in the process of solving which the ability to solve both standard and non-standard problems of a problematic nature is formed. For students of various directions of preparation, tasks were selected in such a way that students could understand the need to know the subjects of the natural science cycle when solving future professional problems in the chosen direction of training. The importance of the ability to solve such

tasks and receive answers to the posed practice-oriented questions was clear to the students, the tasks were interesting and the students, for the most part, were actively involved in the work.



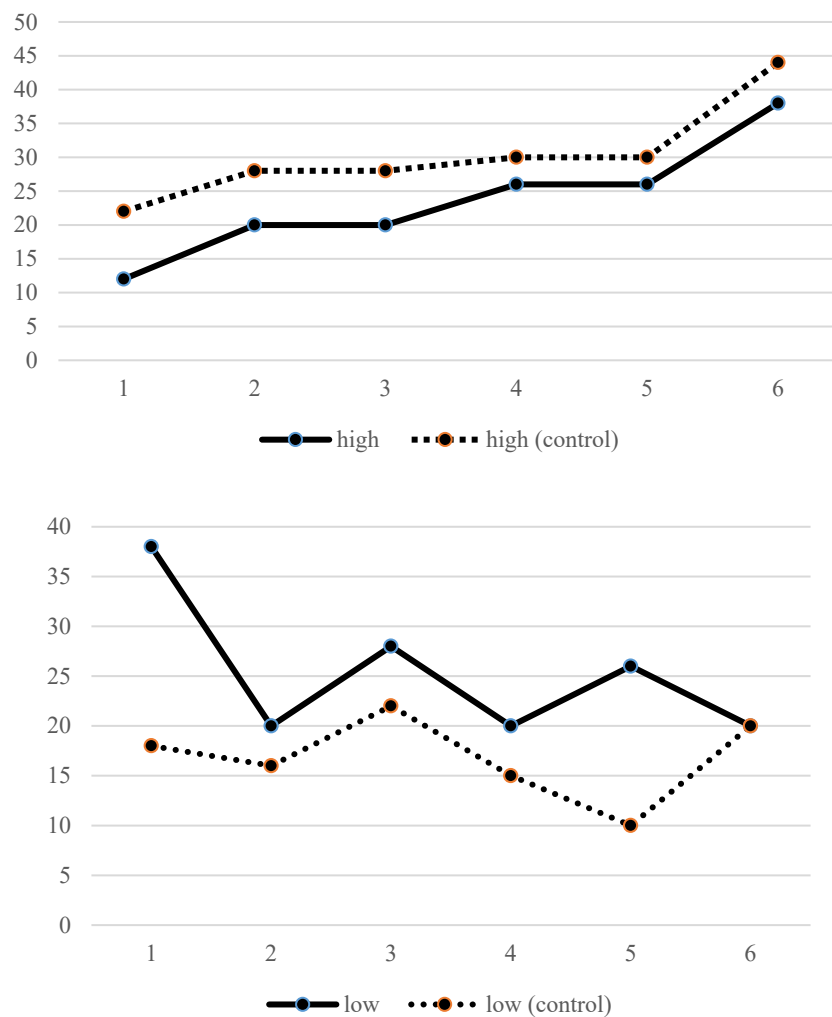
**Figure 3.** The formation levels of cognitive independence of students in the Kuzbass State Agricultural Academy at the ascertaining stage of the experiment

At the end of the session, after passing the exams, the questionnaire survey was repeated by using the same methods as at the ascertaining stage of the experiment. The method of G.A. Karpova makes it possible to determine the development level of educational motivation of students. According to the method, communicative and emotional motive for achieving success are important for the first-year students at the beginning of the semester; then at the control stage of the research, motives for achieving success, cognitive and self-development are in the first place. The number of students at different levels of development of educational motivation also changes (Figure 04).



**Figure 4.** The development level of educational motivation of students in the Kuzbass State Agricultural Academy according to the method of G.A. Karpova at the control stage of the experiment

The histogram shows that the middle level of the educational motivation development remains practically unchanged. However, it is necessary to note an increase in the number of students who are at a high level of formation of motives for achieving goals (by 8.64%), cognitive (by 9.6%) and self-development (by 4.8%). The number of students with a low level of educational motivation has decreased (Figure 05.).

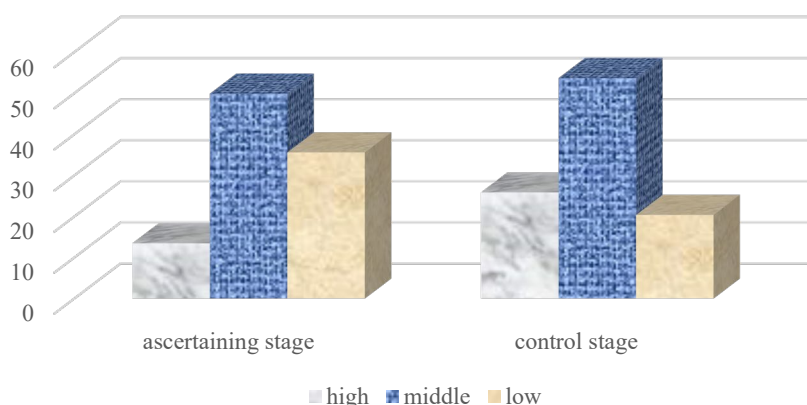


**Figure 5.** Comparative characteristics of changes in the number of students at a high and low level of educational motivation formation at the ascertaining and control stage of the experiment

The comparative characteristics of the results obtained by us suggests that our methodology for applying practice-oriented tasks in the study of subjects of the natural science cycle is quite effective.

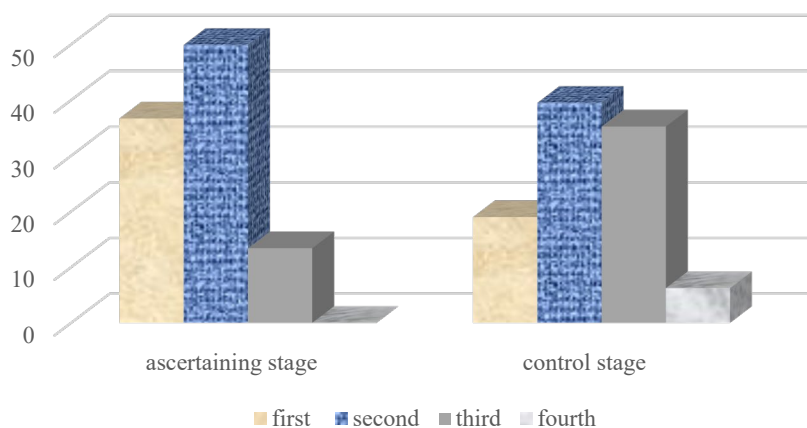
Repeated diagnostics of the development level of self-motivation for educational activities of students according to the method of T.D. Dubovitskaya confirmed this conclusion. The results of data processing showed that the number of students at the intermediate level changed insignificantly. This fact can be explained by the fact that the number of students at a high level increased (by 16.7%), and at a low level - decreased (by 14.6%). Comparative results of the development level of the students' self-motivation of educational activity at classes of the disciplines of the natural science cycle according to the method of T.D. Dubovitskaya at the ascertaining and control stages of the study are presented in Figure 06.





**Figure 6.** Comparative results of the development level of self-motivation for educational activities according to the method of T.D. Dubovitskaya at the ascertaining and control stages of the experiment

The data of the presented histogram show that the number of students who are at the first level of the cognitive independence formation at the ascertaining stage of the experiment decreased by 17.7%, at the second level there was a decrease by 10.4%, at the third level - an increase by 21.9%. After the experiment, it was noted that six students (6.24%) showed a creative or the fourth level of the cognitive independence formation Figure 07).



**Figure 7.** Distribution of students according to the formation levels of cognitive independence at the ascertaining and control stages of the experiment

A qualitative analysis of the obtained data as a result of the experiment, allows making a conclusion about the effectiveness of the use of practice-oriented tasks in the process of teaching students in the classroom of the disciplines of the natural science cycle.

## 7. Conclusion

It was found that the use of practice-oriented tasks has a positive effect on the formation and activation of students' motivation for learning and cognitive independence. The results of the study confirmed the positive dynamics of this influence.

The research has proved the need to use tasks with practice-oriented content in the teaching not only disciplines of the natural science cycle. Students, finding solutions to such problems, find a direction for themselves in the chosen specialty, which will help them self-actualize. Solving practice-oriented tasks in the classroom and performing independent work should not become an isolated one from case to case, but constant and obligatory.

In order to form and activate the cognitive independence and educational motivation of students to study natural science disciplines, it is necessary to simulate production problem situations, which are solved with the help of the knowledge and skills acquired in the classroom. If students understand how they can practically apply the theoretical knowledge gained in the classroom in their professional activities, then the study of complex material becomes more understandable and interesting.

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