

Socio-Pedagogical Conditions of Forming Intellectual Needs of Students of Secondary Vocational Education

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Abstract. Significant changes that have taken place in recent decades in the Russian society, in its value-oriented benchmarks, have certainly been reflected in the nature of the social order to the education system. In this situation, the importance of popular scientific information increases dramatically, and the problems solved with its use are multiplied and complicated. The article shows the use of popular scientific information in the teaching and educational process of the secondary vocational schools, which makes it possible to give a meaningful solution to various problems and develops students' intellectual needs. The success of forming intellectual needs of secondary vocational education students is ensured by creating special socio-pedagogical conditions and stimulating appeal to the sources of popular scientific information; saturating the life of the educational organization with specially created events. The experimental work was carried out on the basis of secondary vocational education of the Bryansk region and 520 students participated in it. The control group consisted of 685 students of secondary vocational education of the same age. The positive changes in forming intellectual needs in popular scientific information among students of secondary vocational education, were recorded in the groups involved in the experimental work, and the absence of those in the control groups, confirms the validity of these conclusions.

1. Introduction

Significant changes that have taken place in recent decades in the Russian society, in its value-oriented benchmarks, have certainly been reflected in the nature of the social order to the education system. Under the new conditions, the vocational school is required to train graduates who are able to act independently, to learn, to solve problems that determine the success of any activity, and who have a universal adaptability to new tasks. In this regard, forming a modern student's intellectual needs is the most important responsibility of the education system, but the theoretical development of the problems associated with the intellectual activity is far from being complete.

Developing human civilization speaks for the fact that the amount of scientific knowledge about the surrounding world has rapidly increased. In this situation, the importance of popular scientific information rises dramatically, and the problems solved with its use are multiplied and complicated. Applying popular scientific information allows rebuilding and optimizing human intellectual activity in accordance with the challenges of time.

All this necessitates the widespread introduction of popular scientific information into the educational process of the modern system of secondary vocational education, which should help students to form motivational and instrumental components of the intellectual activity.

2. Relevance and scientific significance of the research problem.

2.1. Identifying intellectual needs

The problem of needs is of great interest to people and is reflected in the work of many thinkers such as Heraclitus, Plato, Aristotle, Democritus, Socrates, F. Bacon, F. Hobbes, Montesquieu, Voltaire, Rousseau, Golbach, Helvetia, A.I. Kant, T. Mor, M.V. Lomonosov, A.N. Radishchev, A.I. Herzen, N.G. Chernyshevsky and others. In their work, the need was considered primarily from a general philosophical position.

However, as an independent scientific issue, the question of needs was discussed relatively recently, in the first quarter of the 20th century. Obviously, the first work specifically devoted to the needs is the book by L. Brentano, who defined the need as “every negative feeling combined with the desire to eliminate it by removing the dissatisfaction causing it” [2].

Since then, many different points of view have appeared on its essence, from purely biological to socio-economic and philosophical. The ideas of Z. Freud about attraction [4] and G. Hall about the “drive” [13] can be attributed to the purely biological point of view. V.S. Magun’s representations about the needs as a lack of good [12] and D.A. Leontiev’s representations about the relationship between the individual and the world [10] can be attributed to the socio-economic and philosophical points of view.

Most scientific approaches are divided into two philosophical trends: rationalism and irrationalism [3]. According to the rationalistic position, man is a unique being of a special kind, having nothing in common with animals, endowed with reason, thinking and consciousness, possessing the will and freedom of choosing actions. At the same time, the motivational source of human behavior is seen exclusively in the mind, consciousness and will of man. Irrationalism as a doctrine mainly considers the behavior of animals. Proponents of this doctrine proceeded from the statement that, unlike a human, the behavior of an animal was not free.

The first proper psychological theories of motivation are considered to be those that emerged in the XVII-XVIII centuries, these were decision-making theory, explaining human behavior on a rationalistic basis, and automaton theory, explaining animal behavior on an irrationalistic basis. The separate, independent existence of two motivational theories (one for humans, the other for animals) continued until the end of the 19th century.

In the second half of the XIXth century with the advent of Charles Darwin’s evolutionary theory, the prerequisites arose for reconsidering some views on the mechanisms of human behavior. Under the influence of this theory, psychology began an intensive study of rational forms of behavior in animals (V. Köhler, E. Thorndike) and instincts in humans (Z. Freud, W. McDougall, I.P. Pavlov, etc.) [17].

In the course of these studies, the perception of the needs changed. As the motivational factors, man began to attribute the same organic needs, which were previously granted only to an animal.

One of the first manifestations of such an extreme, essentially biological point of view on human behavior was Z. Freud's and W. McDougall's theory of instincts proposed at the end of the 19th century. They tried to explain man’s social behavior by analogy with the behavior of animals.

In the 1920s the theory of instincts was replaced by a concept in which all human behavior was explained by the presence of biological needs. According to this concept, it was considered that humans and animals had common organic needs that had the same effect on behavior. In this concept, there were no fundamental differences between the concepts of “instinct” and “need”, except that instincts were innate and the needs could be acquired and changed throughout life, especially in humans [22].

Also in early XXth century there were two more new directions. This was a behavioral theory of motivation and the theory of higher nervous activity. The behavioral concept of motivation in its essence was a logical continuation of D. Watson’s ideas who was the founder of behaviorism. Representatives of this direction were E. Tolman, C. Hull and B. Skinner. All of them tried to explain the behavior within the framework of the initial behaviorism scheme: “stimulus-reaction”.

Another theory – the theory of higher nervous activity was developed by I.P. Pavlov, and its development continued by his students and followers: N.A. Bernstein, P.C. Anokhin, E.N. Sokolov. Con-

cepts and theories of motivation, attributable only to man, began to appear in psychological science since 1930s. The first of these was the theory of motivation, proposed by K. Levin. The motivational concept of G. Murray suggested a list of secondary (psychogenic) needs arising from instinct-like drives as a result of upbringing and training [18].

Another, even more well-known concept of human behavior motivation, belongs to A. Maslov. According to this concept, a person has seven consecutive classes of needs: physiological (organic) needs, needs for security, needs for belonging and love, needs for respect, cognitive needs, aesthetic needs, needs for self-actualization. [15]. A. Maslov calls the needs the requirements of the lower levels, and he calls the needs of growth the requirements of the upper levels.

In the second half of the XX century theories of human needs were supplemented by a number of motivational concepts presented in the writings of D. McClelland, D. Atkinson, G. Heckhausen, G. Kelly, C. Rotter, and others.

Most of these theories denied the fundamental possibility of creating a single universal theory of motivation, equally successfully explaining both the behavior of animals and man, and stressed that the desire to relieve tension as the main motivational source of purposeful behavior at the human level didn't work, in any case didn't serve as a motivational principle.

Despite the presence of many different approaches to the problem of needs, most psychologists recognize for them the function of stimulating the activity (behavior) of a person.

2.2. The role of popular scientific information in developing intellectual needs of secondary vocational school students

Stimulation from the outside cannot keep students' intellectual activity at the right level for a long time. Therefore, forming intellectual needs is one of the important tasks of the educational complex.

According to the activity approach adopted in Russian science, needs are not only the source of activity, but they are also formed in its course. Therefore, for forming intellectual needs it is important to take into account how intellectual activity is carried out. One of the main factors influencing the formation of a sustainable need for intellectual activity is its content, which serves students in the form of the information they receive from the teacher, literature, television programs and similar sources.

When students are given the tasks, it is necessary to consider their needs: in constant activity, in exercising various functions, including mental ones, in memorizing, thinking; the need for novelty, emotional saturation, reflection and self-esteem, etc. [14].

In this regard, tasks requiring intellectual tension should elicit an emotional response from the students, hurt their self-esteem, i.e. be quite complex. One of the most important ways to achieve such a result is the use of popular scientific information in the teaching and educational process, which makes it possible to give a meaningful solution to various problems and develops the intellectual needs of secondary vocational education students.

The term "information" and the concept it reflects are very common. "Information is data about the surrounding world and the processes occurring in it, perceived by a person or a special device" [19]. Information cannot exist without a source. The variety of sources and consumers of information has led to the existence of various forms of its representation: symbolic; graphic; textual and others [21].

When referring to various sources of popular scientific information it should be mentioned its importance for the recipient. Assimilating information in this state is possible only when the information is not only accepted, but also understood, comprehended. For this reason, each communicative process is a unity of activity, communication and cognition. Scientific and popular information, being an integral part of the general information flow, meets all the requirements for it: correct reflection of the objects of description; novelty for the consumer; timeliness of information delivery. This information has a number of specific characteristics: scientific validity; clear presentation of material in a form accessible to a non-specialist reader; providing an emotional impact on the user of information of any level; expanding scientific outlook; ensuring the possibility of continuous self-education in areas of interest.

The use of popular scientific information in the educational process makes it possible to make the teaching of secondary vocational school students entertaining, which helps to reinforce their intellectual needs, which are actualized to solve various problems.

The following sources of popular scientific information can be distinguished: popular science literature; popular science television and video films; popular science television and radio programs; popular science exhibitions and expositions; Internet network.

The level of education and self-education of secondary vocational school students is significantly influenced by popular science films and TV shows. They represent the organic combination of the scientific way of knowing the world and artistic understanding of the facts in the form of documentary fixation. Popular science films and television shows are an important source of educational information for disclosing the content of educational material by engaging the specialists' opinions on any issue; showing interdisciplinary connections of science and technology; implementing corresponding excursions to the production sites; organizing discussions, conversations in the classroom.

2.3. Organizing activities of the educational organization for forming intellectual needs of secondary vocational education students

Forming intellectual human needs occurs only in the course of its own activity. Consequently, for their successful formation it is necessary to include students in intellectual activity, while creating conditions for its success.

Choosing the popular scientific information presented by various sources as the main means of forming these needs, it was taken into account that it was quite common, available for assimilation, and its use in the activities of the educational organization would make it possible to exert an emotional impact on secondary vocational school students, to intensify their general ability to learn and to solve problems.

Forming students' sustainable intellectual needs as one of the goals of the educational organization, included: studying the level of forming those needs; expanding knowledge about the sources of popular science information; acquainting students with the methods of obtaining popular scientific information; helping them with the initial skills to use this information, assisting in selecting subjects for in-depth study.

Teachers, psychologists, class teachers, parents acted as educators who organized the process of forming students' intellectual needs, because only during their own activity their psyche developed, and the participation of an older, more experienced partner, such as a teacher or psychologist, contributed to the success of the students' activity. The course was taken to create an intellectual environment at a vocational school, to saturate it with various events that constantly require the students' intellectual activity and to actualize their appeal to sources of popular scientific information. The events were held in various forms: class hours, discussions, conversations, independent work; consultations, etc.

In the general system of educational work, key issues were identified, the preparation of which required to increase all participants' activity, intellectual mobilization. Their implementation instrumentation was based on the technologies of collective creative activity (I.P. Ivanov), the mechanisms for updating group emotional states (A.N. Lutoshkin).

The level of the proposed popular scientific information was measured in proportion to the students' age and their preparation degree. Interacting with students was organized in such a way that students were aware of the expediency and the need for popular scientific information, so that the way of the upcoming activity, its course was clear and accepted by the students. Organizing the cooperation of students in groups, teachers ensured that each student of the educational team had a specific task, knew how to carry it out, and was responsible for the quality and timeliness of its performance. So, by organizing discussions ("Be kind-hearted", "Be a man", "Be humane"), students were encouraged to express their personal opinions, to defend their own positions. This intensified the intellectual activity of secondary vocational school students, who were satisfied with the discussion and were highly emotional. They thought about the problems that were of particular importance to them now.

In this regard, it was useful to organize thematic excursions to the fire exhibition, to the factories, as well as to the Bryansk United Regional Museum. During the tours explanations were given taking into account the peculiarities of students' cognitive activity. Before these events, a preliminary discussion was held, during which the teachers clarified the type of independent work which was to be performed using the information from popular scientific materials in the form of drawings, pictures, models with their detailed description. These tasks provoked an emotional response from the students, touched their self-esteem, allowed them not only to learn new things, but also comprehend past knowledge and experience.

So, when conducting an environmental event in chemistry and biology, students expanded their understanding of the global environmental problems of mankind and expressed their own opinions, shared their impressions of the facts described in popular science sources they found. Short time and small in semantic volume, emotionally attractive and informatively significant messages and reports on various training topics were used. Students systematically participated in preparing and conducting extracurricular activities: "Romance of the Sea", "Journey through chemical labyrinths"; class hours: "The Trial of Drugs", "Traveling abroad"; chemical and biological Olympiad; conversations: "Take care of the forest", "Protect Nature." Despite having a different level of students' cognitive interests, the teachers introduced them into a circle of technical problems, encouraged them to do creative activities and to make conditions for the practical application of their knowledge and skills.

Relevant sources of popular scientific information were indicated, ranging from popular science publications indicated in the recommended list of references to the addresses of relevant sites in the Internet, which were accompanied by annotations or feedback from students who had familiarized themselves with them earlier.

Organizing school life activities on forming students' intellectual needs in popular scientific information was held with the parents' support, which had a beneficial effect on its outcome. The teachers organized parents' meetings on issues related to the students' information culture, using various sources of popular scientific information. The teachers informed parents about the possibilities of the educational organization to form the students' intellectual needs; to develop a joint program of actions; to encourage parents to look for joint answers to many problematic issues. Parents' meetings were held both in the form of parents and class teacher conversations, and in the form of press conferences and subject teachers and a school librarian, and a psychologist were invited there.

At the final stage of experimental work, positive changes were observed in the intellectual activity of its participants. In the students' behavior, there was an increased desire to find, possess and use popular-scientific information, which was not noticeable in the educational organizations that were not included in similar work. At the same time, in the experimental groups, the problem-search character of the students' activity was used, their life was full of specially created events that actualized their work with sources of popular scientific information. In these groups, a problem-oriented subject-subject interaction of educators and students was organized in the course of solving intellectual problems and contributed to the students' prestige in interpersonal relationships. The forms of organizing intellectual activity in experimental groups differed in their diversity, cognitive significance and emotional appeal to students. Together, these conditions contributed to training students' intellectual needs in popular scientific information.

3. Discussing the results of forming secondary vocational school students' intellectual needs in popular scientific information

Applying the system of means and methods proposed for forming secondary vocational school students' intellectual needs in popular science information was fulfilled in the real educational process of secondary schools. The experimental work was carried out on the basis of secondary vocational education of the Bryansk region and 520 students participated in it. The control group consisted of 685 students of secondary vocational education of the same age.

Analyzing the availability of popular scientific literature in school libraries, popular science videos in the video libraries and radio and television programs in the broadcasting network allowed us to compile lists of the recommended popular scientific materials for using in educational activities.

The survey of students of experimental and control groups was carried out 2 times: the first section was made before the beginning of the formative work, the second was made after completing this work.

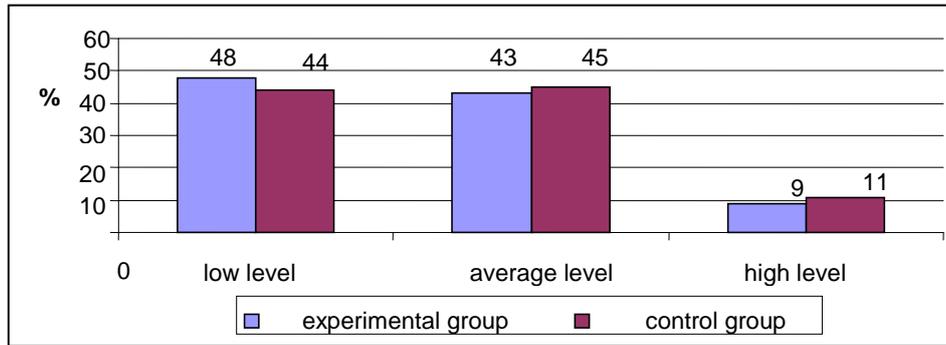


Figure 1. The results of the survey of the experimental and control groups.

The data presented in Fig. 1 show that according to the results of educators' survey who assessed the development degree of vocational school students' cognitive needs, basing on observations and conversations with other teachers and with students' parents, only 11% of the students in the control group and 9% of the students in the experimental group has a high level of developing these needs. 45% of the students in the control group and 43% of the students in the experimental group have the average level of intensity of cognitive needs. At the same time, 44% of the students in the control group and 48% of the students in the experimental group are referred by educators to the group of those with poor cognitive needs.

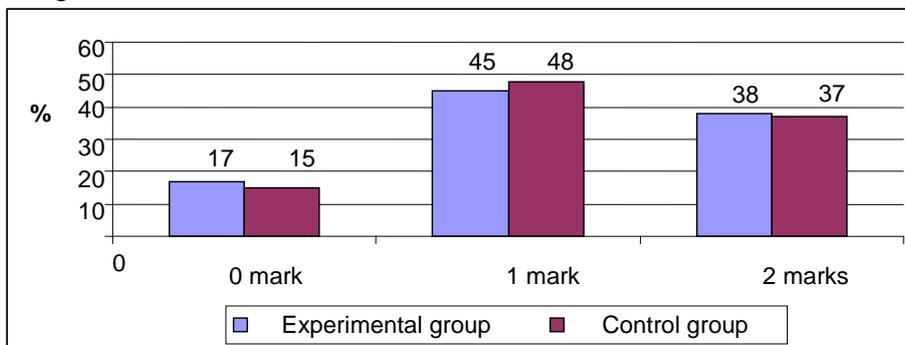


Figure 2. The results of the students' survey in the experimental and control groups at the ascertaining stage using the methodology for identifying the formation of aptitudes of vocational school students to intellectual activity.

Fig. 2 reflects that 37% of the responses from the students in the control group and 38% from the students in the experimental group indicate that the respondents would like the actions described in the questionnaire as components of intellectual activity to be included in their future work. At the same time, the answer "all the same" is seen in 48% of the students' answers in the control group and in 45% of the students' answers in the experimental group. Negative attitudes towards various components of intellectual activity are expressed in 15% of the responses of the control group students and in 17% of the responses of the experimental group students.

Using the method of identifying the degree of forming an intellectual type of personality according to J. Holland's typology showed that at the time of the initial survey, the majority of the students had an average level of expression of this type (58% of the students in the control group and 55% of the

students in the experimental group). At the same time, the percentage of students with low and high levels of forming an intellectual personality type was also approximately the same in the experimental and control groups (see Fig. 3).

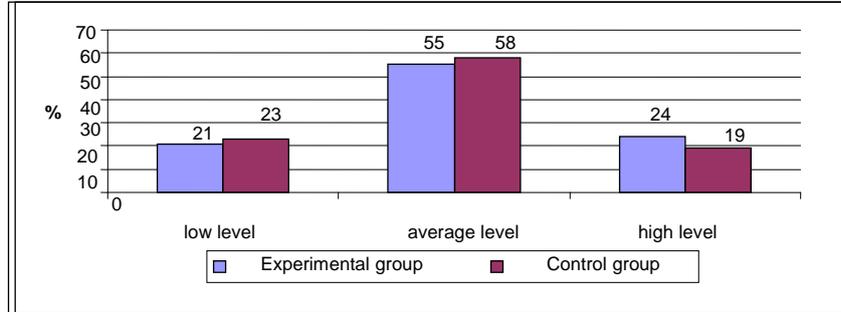


Figure 3. The results of the students’ survey in the experimental and control groups at the ascertaining stage using the methodology for determining the formation of an intellectual personality type.

Studying the inclinations of vocational school students to mental types of work, we found that at the ascertaining stage of the experiment, 26% of the students in the control group and 28% of the students in the experimental group had a low level of developing these aptitudes. At the same time, 40% of the students in the control group and 35% of the experimental group had an average level of an expressed tendency toward mental work, and, respectively, 34% and 37% had a high level (see Fig. 4).

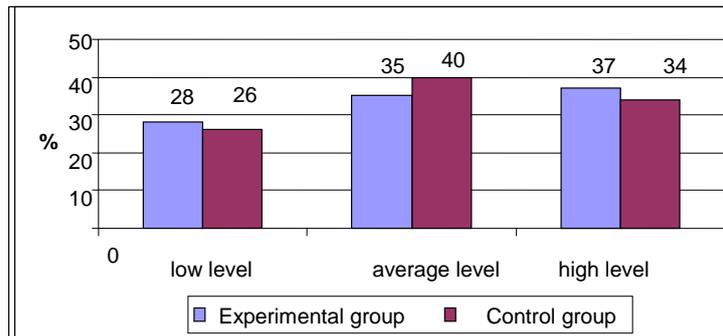


Figure 4. The results of the survey of the experimental and control group students at the ascertaining stage using the method of determining aptitudes towards mental types of work.

Analysis of developing students’ intellectual needs carried out by the experts-educators, well aware of the features of secondary vocational education students’ intellectual activity, showed that only one tenth of the students (9% of the students in the control group and 10% of the students in the experimental group) had a high level of developing intellectual needs at this stage of the study.

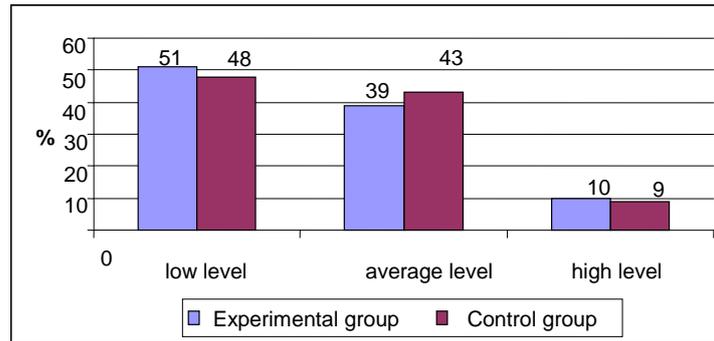


Figure 5. The results of the survey of the experimental and control group students at the ascertaining stage using the expert assessment of the level of developing intellectual needs.

The average level of developing intellectual needs was noted by experts-educators in 43% of the students in the control group and in 39% of the students in the experimental group. The group of students who had a low level of forming intellectual needs was the most numerous – 48% of the students in the control group and 51% of the students in the experimental group showed that (see Fig. 5).

Having made a formative impact in the experimental groups, we again examined the entire sample of students using the same diagnostic methods to identify changes that had occurred in the groups of students since the initial survey. These changes are presented in fig. 6-15.

As it is seen in fig. 6, changes in developing the cognitive needs of secondary vocational education students in the experimental group were quite significant during the formative impact. Thus, the number of students who had a low level of developing these needs was reduced by 16%. At the same time, the number of students in the secondary vocational education who had an average and high level of forming these personal traits increased by 9% and 7%, respectively.

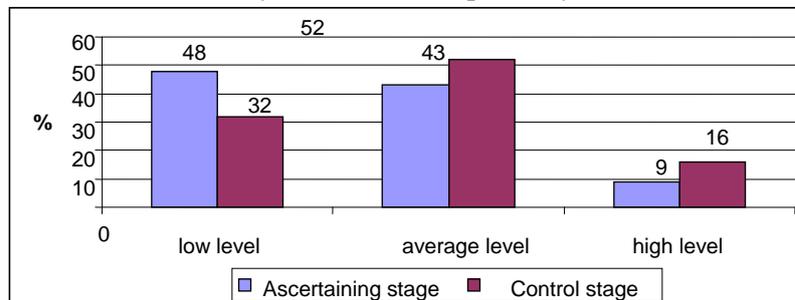


Figure 6. Changes recorded as a result of the survey of the experimental group students using the method of studying the cognitive needs of secondary vocational school students.

In the control group, such positive changes were significantly less pronounced: the changes within each of the levels of developing cognitive needs were no more than 4% (see Fig. 7).

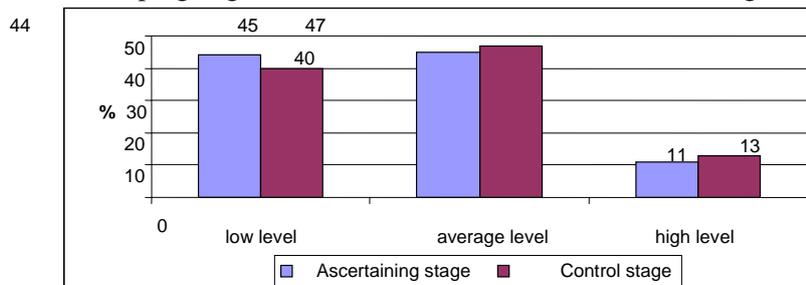


Figure 7. Changes recorded as a result of the survey of the control group students using the method of studying the cognitive needs of secondary vocational school students.

Content analysis (see fig. 8) shows that in the experimental group of students, since the initial survey, the number of students' responses that assessed the significance for their future work of the intellectual actions listed in the methodology has increased by 2 points from 38% to 49%. Such a change occurred due to a decrease in the indifferent and negative responses of the students in the experimental groups by 5% and 6%, respectively.

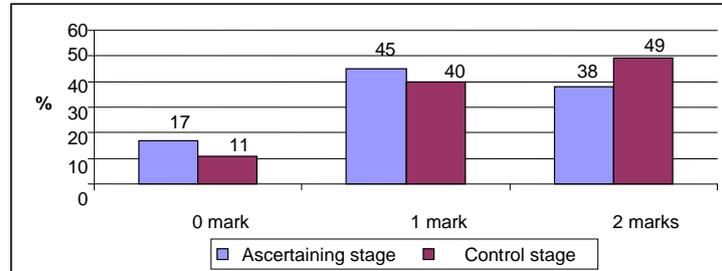


Figure 8. Changes recorded as a result of the survey of the experimental group students using the method of identifying the formation of secondary vocational school students' aptitudes to intellectual activity.

Positive changes in developing secondary vocational school students' aptitudes to intellectual activity among students in the control group turned out to be insignificant (see Fig. 9).

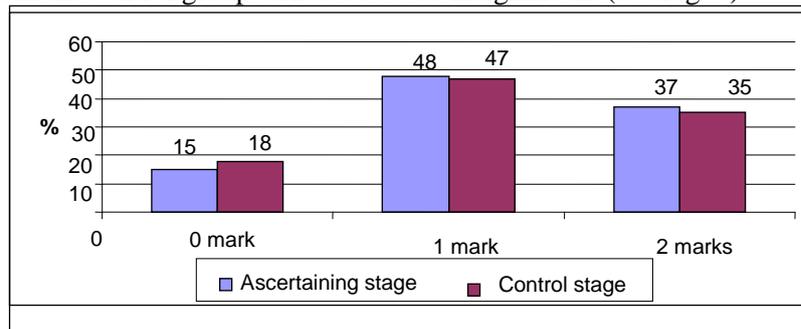


Figure 9. Changes recorded as a result of the survey of the control group students using the method of identifying the formation of secondary vocational schools students' aptitudes to intellectual activity.

The analysis of the students' answers of the experimental group to the questions of the method for determining the formation of an intellectual type of personality (see Fig. 10) indicates that the number of students with a high level of its formation from the time of the survey at this stage of the study has not increased very much – from 24% to 28%. At the same time, the number of students in secondary vocational education who had an average level of expression of an intellectual personality type has decreased from 55% to 52%, and a low level has decreased from 21% to 20%.

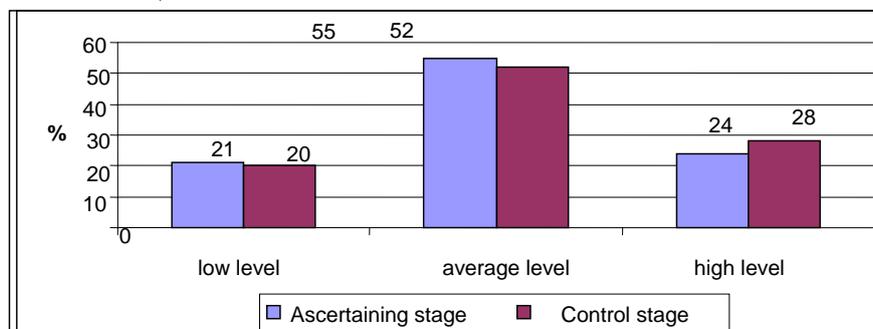


Figure 10. Changes recorded as a result of the survey of the experimental group students using the methodology for determining the formation of an intellectual personality type.

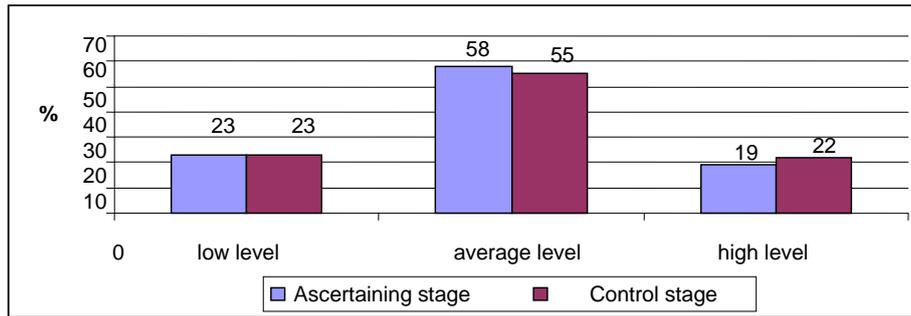


Figure 11. Changes recorded as a result of the survey of the control group students using the methodology for determining the formation of an intellectual personality type.

In the control group, similar changes occurred during the same period of time (see Fig. 11).

During the formative experiment, there were small changes in the secondary vocational school students' inclinations to mental types of work (see Fig. 12 and Fig. 13).

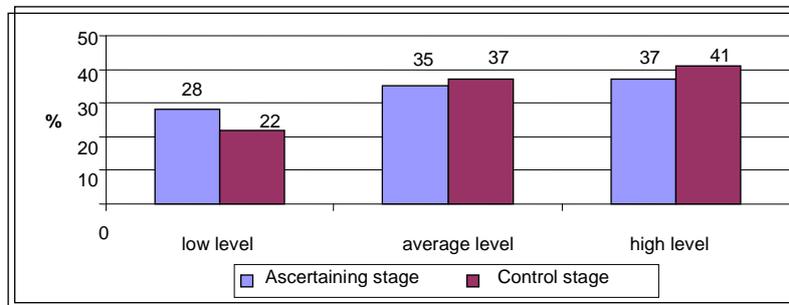


Figure 12. Changes recorded as a result of the survey of the experimental group students using the method of determining aptitudes to mental types of work.

So in the experimental group, the number of students with a low level of mental activities has decreased by 6% (see Fig. 12). In the control group, this change is 1% (see Fig. 13).

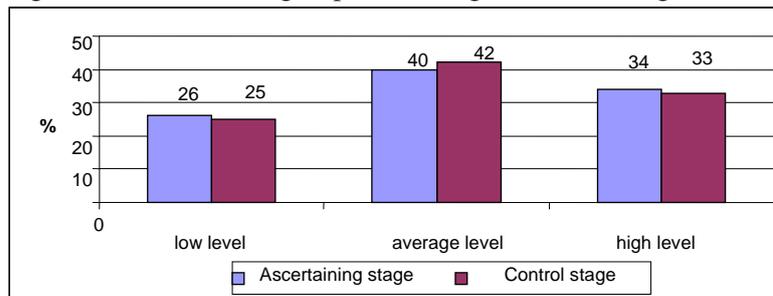


Figure 13. Changes recorded as a result of the survey of the control group students using the method of determining aptitudes to mental types of work.

Comparing the results of expert assessment of the level of developing the students' intellectual needs, carried out before and after the formative work, revealed an increase in the level of developing these needs among the students of the experimental group: the number of students with a vocational education having a low level of intellectual needs has decreased by 20%, while the number of those with an average and a high level has increased by 12% and 8%, respectively (see Fig. 14).

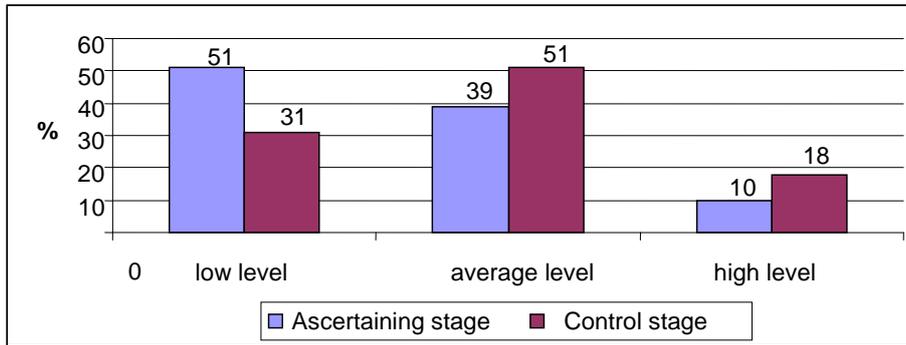


Figure 14. Changes recorded as a result of the survey of the experimental group students with the help of expert assessment of the level of developing intellectual needs.

When examining the students in the control group, such changes, although they occurred, turned out to be insignificant (see Fig. 15) and did not make up more than 2% within the same group of results.

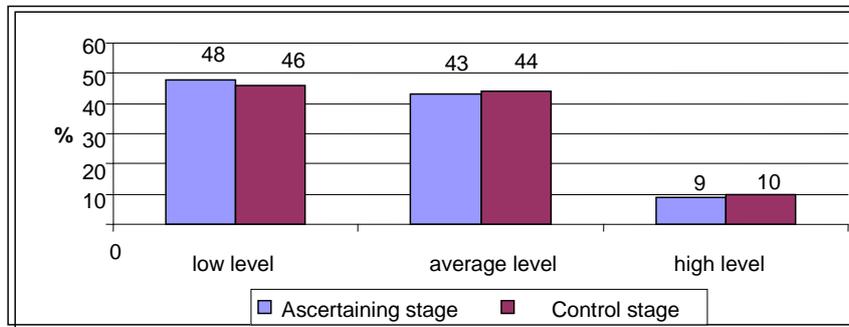


Figure 15. Changes recorded as a result of the survey of the control group students with the help of expert assessment of the level of developing intellectual needs.

Thus, analyzing the survey data of the students in the secondary vocational education conducted at the ascertaining and control stages of the experiment, one can note the presence of positive changes in developing the students' intellectual needs in the experimental group. Positive changes in developing intellectual needs of secondary vocational education students, included in the experimental group, are caused precisely by the experimental influence. This proves the effectiveness of the proposed system of the means and methods of forming these needs.

4. Conclusion

1. The effectiveness of forming the intellectual needs of popular-scientific information among the students of the secondary vocational education is achieved if the organization of this process includes:

- using cognitively meaningful and emotionally attractive popular scientific information from various sources; the inclusion of students in preparing and conducting entertaining experiments and demonstrations;
- preparing and conducting excursions to production sites, visits to thematic exhibitions and exhibitions of the local museums;
- creating problematic situations, which allow students to solve problems, using the necessary material from available sources of popular scientific information;

2. The success of the forming intellectual needs of vocational education students is ensured by creating such socio-pedagogical conditions as: giving intellectual activity, problem-searching and stimulating appeal to the sources of popular scientific information; ensuring the prestige of students in social and individual aspects.

3. The positive changes in forming intellectual needs in popular scientific information among the students of the secondary vocational education, recorded in the groups involved in the experimental work, and the absence of those in the control groups, confirms the validity of these conclusions.

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