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METACOGNITIVE SKILLS AND REFLECTION AS ESSENTIAL COMPONENTS OF SELF-EDUCATION

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This paper presents an analysis of the metacognitive skills and reflection as important elements for ensuring the success of self-education process. The purpose of this study was to identify the specific conditions for the development of metacognitive skills and to determine the most efficient learning strategies. To achieve this, the theoretical aspects of metacognitive skills and reflection that effect the success of self-education have been analysed. This paper describes the pedagogical conditions of education necessary for the development of students' metacognitive skills and reflection. A knowledge monitoring assessment instrument was used to determine the level of students' reflection and metacognitive awareness. The results of the study showed that the metacognitive skills, the ability to reflect, and the metacognitive awareness among students were of low level. The results also emphasise the importance of metacognitive skills and reflection for successful strategy-based cognitive activity and self-education.

KEYWORDS: Reflection, Self-Education, Metacognitive Strategies, Metacognition, Metacognitive Skills.

INTRODUCTION

In the modern world, the requirements for young professionals are growing rapidly. More than ever, they have to be able to adapt quickly to new situations, apply analytical and creative abilities, and solve non-standard tasks and problem situations. As a result, success in professional and educational activities depends on the ability to self-educate. A specialist with a desire and

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readiness for self-education will be able to quickly and efficiently master the training material, together with the required professional functions in a new place of work. The process of modernizing the education system of Russia, especially higher education, sets the task of training specialists who can adapt to changing life circumstances, independently acquire the necessary knowledge, putting this knowledge into practice, while possessing analytical and creative abilities, and self-education abilities. The competency-based approach of modern education is focused on the formation of the ability and willingness of future specialists to successfully solve personally and professionally significant tasks. The introduction of the latest generation of federal state educational standards is associated with the transition to a higher education system that will provide the basis for lifelong education throughout life, along with general and professional training. Education for sustainable development, therefore, means normalizing of lifelong education which is a serious task for modern society.

Self-education is a focused, conscious cognitive activity aimed at solving problems arising at different stages of professional life and any other activity performed in order to satisfy our needs and the needs of society (Bailuk, 2012). The effectiveness of students' self-education is associated with the development of metacognitive skills that help manage their cognitive processes. Metacognition helps with understanding not only the meaning of the content being studied but also the learning process itself, which allows us to consider metacognitive skills as the basis for successful cognitive activity and self-education (Hartman, 2001). Metacognition is a deliberate conscious thought process aimed at performing cognitive tasks (Schraw & Moshman, 1995).

Metacognitive skills are skills that allow us to independently plan, regulate and control cognitive activity (Belenkova, 2018). Metacognitive skills are associated with mastering metacognitive strategies, which include setting goals and objectives, planning your cognitive activities and evaluating results. The regulator of this activity is reflection, which performs a regulatory function in the process of applying metacognitive skills and becoming educated in general. Thus, reflection is involved in the organization and control of cognitive activity, which requires the understanding of actions for its effectiveness and productivity (Tereshonok & Baksheeva, 2015).

Each student independently forms their metacognitive strategies during the educational process, which leads to the development of an ability to self-educate. Reflection mechanisms are implemented in metacognitive skills. Thus, reflection can act as a regulator of cognitive activity, which is a metacognitive mechanism (Prokhorov & Chernov, 2014). Reflection is a

thought process that is aimed at analyzing one's cognitive activity, at choosing methods and techniques for carrying out an activity, and at evaluating the effectiveness of actions and the results of one's activities (Roslyakova, 2008).

In the educational process of a modern university, there are contradictions between several factors i.e. between the need to focus on the self-education or self-development of a person and the university's traditional training system; between the objective requirements of society and the real training of university graduates; between the existing traditional system of teaching university students and the need to develop metacognitive skills and reflection; and between the need for students to form metacognitive strategies and the lack of scientific and methodological support for this process.

Based on the identified contradictions, a research problem was formulated which is as follows: what are the specific pedagogical conditions for the development of student metacognitive skills and self-reflection based on effective metacognitive strategies?

The purpose of the study is to determine the pedagogical conditions for the development of students' metacognitive and self-reflection skills, together with the identification of metacognitive strategies to increase the effectiveness of cognitive activity and self-education.

Review Of Literature

To clarify the role of metacognition skills in self-education, we consider the concept of "metacognition" as self-education is directly based on metacognition. In domestic and foreign literature, metacognition is considered as a factor in the success of cognitive activity, concerning effectiveness and productivity. But by studying the psychological, pedagogical and methodological literature, we found many different definitions of both this concept and its structure. Let us first try to determine the concept of "metacognition," summarizing the accumulated experience. For the first time, metacognition was described by the American scientist Flavell, who defined it as the ability to analyze one's mental strategies and cognitive activity. Metacognition is knowledge of one's cognitive processes and cognitive activity strategies, which are used as ways of acquiring knowledge. Flavell identified four components of metacognition: metacognitive knowledge, metacognitive experience, cognitive goals or objectives, and cognitive actions or strategies (Flavell, 1976).

Shraw defines metacognition as intentional conscious thought processes aimed at completing cognitive tasks. Metacognitive skills allow us to manage the cognitive processes and use metacognitive strategies to solve problems.

Metacognitive strategies are a sequence of actions aimed at planning and controlling cognitive processes, as well as analyzing the results obtained by following the goals (Schraw & Moshman, 1995). Similar opinion was expressed by Wilson who identified three components of metacognition: metacognitive awareness, metacognitive assessment, and metacognitive regulation.

Shulgina (2017) defines metacognitive knowledge as knowledge of oneself, plus one's cognitive processes and actions aimed at a specific result of cognitive activity. Metacognition is knowledge of one's cognitive characteristics, such as memory and thinking, as well as metacognitive skills in terms of applying effective strategies in the process of one's cognitive activity. The content of metacognitive knowledge is made up of information concerning cognitive processes, while the content of cognitive knowledge concerns objects and images of the surrounding world. Consciousness governs practical activity, and metacognition governs the activity of cognition. Metacognitive strategies are ways to achieve cognitive goals, and metacognition includes the process of reflection. The level of reflection is associated with the accumulated metacognitive experience of cognitive activity, i.e. with metacognitive strategies (Shulgina, 2017). The success of training and self-education is largely affected by reflection as a metacognitive process. Reflection provides the conscious regulation of one's cognitive activity with the help of meta-cognitive skills, through analysis and comprehension of one's cognitive experience.

Samoylichenko and Tokmakova (2017) note that the ability to carry out self-reflection allows us to consciously control and regulate our cognitive processes, and metacognition also refers to them. There are several approaches to the study of self-reflection, one of which is the metacognitive approach. With the metacognitive approach, self-reflection is associated not only with an analysis of internal cognitive processes, but also with the inversion of cognitive processes outside i.e. activity, behavior, and communication. Thus, the main function of self-reflection is to regulate the external activity of the subject through conscious control and the implementation of cognitive activity.

Based on the literature studied, the following components can be identified in the structure of metacognition: metacognitive knowledge, metacognitive skills, metacognitive strategies and reflection.

Metacognitive skills are skills that allow you to independently plan, regulate and control cognitive activity, and this, in turn, is the basis of self-education. The metacognitive skills involved in the learning process allow not only for the study of educational material, but also for its ability to obtain new knowledge and to evaluate, analyze, and determine strategies for obtaining information from your opinion and attitude. The development of

metacognitive skills allows you to develop a learning style, both in the course of solving individual problems and in learning and self-education in general (Belenkova, 2018).

In the learning process, students are faced with obstacles to achieving their desired goals. To increase the effectiveness of cognitive activity and self-education, knowledge regarding metacognitive strategies designed to transform motivational intentions into actions is necessary (Hoffman, 2015). Jones (2017) believes that the learning process should develop the ability to self-educate. Self-education assumes that students are active participants who can independently set and achieve their learning goals. One of the strategies for developing self-education ability is to ask students to develop questions for an exam. The process of developing questions activates metacognition. So, instead of just remembering or applying the material, students should think about how to evaluate their knowledge of the material.

According to Bailuk (2012), self-education is a conscious, self-governing reproductive and cognitive activity a person develops, which is aimed at reproducing (mastering) the knowledge experience of society in order to satisfy personally and professionally significant needs.

Modern studies describe the following types of self-education:

1. basic self-education, which includes spiritual, moral and aesthetic self-education;
2. esoteric or internal self-education, involving the acquisition of knowledge about the self-education process, about health and a healthy lifestyle;
3. exoteric or external self-education: professional aspect, socio-political, legal, economic, family, household and others.

Thus, self-education is considered to be the organized acquisition of knowledge and skills through independent cognitive activity.

Concerning university education, it is independent work that forms the readiness for self-education and creates the basis for continuing studies. Ros and Martens (2012) see the lack of direct teacher involvement as the main sign of self-education.

Valverde, Sovet and Lubart (2017) emphasized the importance of self-education in making career and professional decisions. Students with a low level of creativity and independence are more likely to experience career indecision. This is because, for the effective implementation of further professional activities, students must assimilate additional volumes of

information and acquire skills by following the requirements of society.

One of the main tasks of higher education is to teach oneself to learn and acquire new knowledge and skills, forming the capacity for conscious self-educational activity. In this regard, learning becomes important, during which students learn to solve tasks and achieve the desired results. Students are offered tasks with increasing complexity, while the necessary support is systematically provided. With this approach, skills are developed that allow us to successfully cope with tasks in unusual situations and to solve problems (Yusof, Alwi, Sadikin & Abdul-Aziz, 2015).

The success of training and self-education is largely affected by self-reflection. In psychology and pedagogy, reflection is defined as a means of self-regulation, and as a process of self-knowledge for their mental characteristics. In the context of our study, we consider self-reflection as a metacognitive process that regulates the cognitive activity of students. With the help of self-reflection, a student can choose methods and techniques for the implementation of cognitive activity, as well as evaluating the effectiveness of actions and analyze the results along with their psycho-emotional state.

Roslyakova (2008) claims that students with low self-reflection perform impulsive actions, do not know how to set goals and objectives, think carefully about problem situations, and need external control of their activities, which affects their performance. Students with a high degree of self-reflection are more successful in solving educational problems, consciously set goals and objectives, plan their activities, choose a method for implementation and analyze the results. They are also distinguished by a high degree of anxiety regarding the success of their activities.

The process of formation of self-reflection includes several important stages, of which Polkina (2015) distinguishes four. At the first stage, an analysis of the activity and an assessment of the results is done. At the second stage, the components and the main actions performed during the educational and cognitive activity are highlighted. The third stage is an assessment of the effectiveness of the actions taken by following the goals. At the fourth stage, the results are summed up and the results of the activity itself, the methods and techniques of its implementation and the emotional components of the process are evaluated. Self-reflection is an indicator of the ability to self-educate and an important component in the structure of the student's personality.

An analysis of the scientific and methodological literature and pedagogical experience showed that, without self-reflection and metacognitive skills, the process of self-education cannot be successful, but students do not have enough skills. Noting the theoretical and practical value of the research, it

should be recognized that we were not able to find work in which the problem of improving the efficiency of self-education would be considered in respect of metacognitive skills and self-reflection. Also, an analysis of the teaching literature showed a lack of development regarding metacognitive strategies and the determination of the most effective kinds. Therefore, the problem of the development of metacognitive skills and self-reflection of students, taking into account the definition of pedagogical conditions for their development to increase the efficiency of cognitive activity and self-education, has been insufficiently studied so requires close attention and research.

RESEARCH METHODOLOGY

A pilot study was conducted at the Samara State Technical University by carrying out the pedagogical activities in teaching students of the Faculty of Engineering and Economics. The study involved 120 students (control and experimental groups included 60 respondents each) and was conducted in three interrelated stages.

The first stage included the study and analysis of scientific and methodological literature regarding the problem of the development of metacognitive skills and self-reflection. A study was conducted to find ways to increase the effectiveness of cognitive activity and self-education. Based on the analysis of literature and pedagogical experience, pedagogical conditions for the development of metacognitive skills and self-reflection were identified.

At the second stage of the study, the basic level of ownership of metacognitive strategies was determined based on the method of pedagogical observation. At this stage, the metacognitive skills and metacognitive awareness of students were evaluated. But there were difficulties in evaluating them as these indicators were difficult to measure. We settled on the method of assessing the monitoring knowledge as given by Tobias and Everson (2002). First, a survey was conducted of students on their knowledge of a certain metacognitive activity and then a question was asked that showed whether they correctly assessed their knowledge.

According to the survey, all students were divided into four groups. The first group, a, includes students who claim to know and confirm their knowledge. The second group, b, includes students who claim that they do not know and confirm. The third group, c, has students claiming to know but who cannot confirm this. The fourth group, d, includes students who claim to not know and confirm this. The result is calculated by the formula $E =(a+d) – (b+c) / (a+d) + (b+c)$. The value of E is between -1 and 1. The value is close to 1 when students are not mistaken in assessing their knowledge, and close to -1 when students incorrectly evaluate their knowledge (Tobias and Everson, 2002).

At this stage of the study, learning outcomes in the control group were evaluated. To evaluate learning outcomes, we used conversation and testing as effective forms of control. When evaluating the results of the control, it is recommended that you consider not the errors but the number of correct answers. If there are more than 50% correct answers, then we will consider the result as satisfactory and if it is more than 75% then the result is considered as good. We give preference to digital indicators, i.e. the number of points which will correspond to the number of correct answers of the proposed test. To carry out the control, we developed tests based on the following methods:

1. the method of choosing from several proposed options;
2. supplement method (you must fill in the blanks);
3. method of establishing compliance;
4. a method for determining the truth or falsity of formulated judgments – free presentation method.

To determine the level of formation of skills in the application of metacognitive strategies and reflection, we conducted a survey of students in the control group based on the self-assessment method. Note that this method of evaluating the results is conditional as there is no sufficiently substantiated scientific method. We give preference to digital indicators, as they can be used to easily conduct a comparative analysis of the initial and control results.

In the express questionnaire, students were offered a series of statements with responses as “yes”, “no”, and “sometimes”. The list of statements in the questionnaire corresponded to effective metacognitive strategies such as 1. I always determine the purpose of reading; 2. I pay attention to illustrations, diagrams, and get acquainted with comments before studying new material; 3. I always think about what I learned new and how it relates to what I already know; 4. Draw up a plan or sketch out the content of the material being studied and so on.

To determine the quality of mastery of metacognitive skills and self-reflection, three levels were distinguished i.e. low, medium, and high. A low level suggests that a student lacks metacognition skills and self-reflection. At the average level of development, the student can set goals and objectives, choose methods and techniques for carrying out activities, as well as analyzing and evaluating the results of their educational activities, with the help of a teacher. At a high level, the student carries out self-reflection and chooses a strategy for performing activities independently based on their own logic, conclusions, knowledge, and skills, and is capable of conscious self-

development and self-education. At the third stage of the study, based on the literature analysis, processing the results of the research and the experience of pedagogical activities, effective metacognitive strategies were identified. To assess the effectiveness of the application of the proposed strategies, we used a methodology for setting marks on a traditional 5-point scale, and testing was conducted to assess the knowledge gained on the basis of a method of choosing from several options proposed i.e. the method of addition, the method of establishing correspondence, the method of determining the truth or falsity of formulated judgments, and free presentation method. To determine skill formulation level in the application of metacognitive strategies, a survey of students from the experimental group was conducted. At this stage, the results of the experiment were summarized and an analysis of the results of the study was carried out.

In our study, as part of studying the role of reflection, metacognitive skills and evaluating metacognitive awareness for successful learning, the following tasks were solved:

- Justify the need for the formation of metacognitive skills and self-reflection for modern education and self-education.
- Determine the pedagogical conditions for the formation of metacognitive skills and self-reflection.
- Determine the level of knowledge of metacognitive skills and self-reflection skills of university students.
- Determine the level of metacognitive awareness of students based on the method of assessing monitoring knowledge.
- Identify the relationship between successful learning and the level of development of metacognitive awareness and self-reflection.
- Identify metacognitive strategies that contribute to the effectiveness of the educational process and self-education.

Results Of The Study

Based on theoretical research methods (studies of scientific literature and its theoretical analysis), during the study, we identified pedagogical conditions for the formation of metacognitive skills and student self-reflection, which are a combination of external and internal factors, detailed as follows:

1. Involvement of students in the active planning of their educational activities and independent setting of goals and objectives. The teacher and student jointly develop forms of learning activity, together with the content and assessment criteria. In such conditions, students develop their own position toward the acquired knowledge and skills, as well as actively participating in the management and planning of educational activities.
2. Teaching students' metacognitive strategies of cognitive activity to improve the effectiveness of the educational process.
3. The implementation of an effective assessment of the teacher, contributing to the formation of student self-esteem, which is ensured by the use of adequate forms of evaluative impacts focusing on the success of the student in the learning process and justification for assessing student learning activities.
4. How methods of mutual control and self-control are used in the educational process, contributing to the activation of cognitive activity, the formation of students' self-esteem and the creation of favorable team relationships (Belenkova, 2017).

Based on the method of pedagogical observation, it was revealed that students conducting independent work often use ineffective teaching strategies. Observing student behavior confirms that less effective strategies are popular and that students, as a rule, are not very well versed in the strategies that will help them learn. As a result, they do not use their time as efficiently as possible. The ease and fluency that arises when using some strategies (usually passive, such as highlighting or re-reading) can cause the illusions of memorization and learning and the difficulties that arise when using other strategies are often interpreted as signs that learning is not going as smoothly as it should. However, such difficulties can be called desirable, as they slow down the apparent speed of learning but increase its effectiveness (Løkse, Låg, Solberg, Andreassen & Stenersen, 2017). It is fair to say that most students are not very knowledgeable about what learning activities will help them in the learning process.

Based on the monitoring knowledge assessment method, we conducted a student survey on awareness of the concepts and role of self-education and self-development in the educational process. The results of the study were obtained and calculated by the formula E = (5+1) - (21+33) / (5+1) + (21+33) = -0.8, which shows a low level of metacognitive awareness, i.e. students are often mistaken in assessing their knowledge.

The study showed differences in the level of reflexive abilities and metacognitive awareness among participating students. At the same time, it can also be concluded that the general level of metacognitive awareness is quite low since students do not realize and often incorrectly assess their knowledge.

The study also showed a relationship between academic performance and the level of metacognitive awareness and self-reflective abilities in students, which is explained by the fact that reflection is an important component of successful student learning and performs the regulatory function of independent cognitive activity.

We also surveyed students based on the method of self-esteem. When conducting a questionnaire to determine the level of skill formation in the application of meta-cognitive strategies and self-reflection, the following was revealed: 1) awareness of the importance and willingness of students to develop metacognitive skills during training; 2) the low level of development of metacognitive skills in the application of learning strategies, which indicates the lack of metacognitive skills and reflection among students.

In the course of training and self-education, we suggest using the following strategies:

1. **Planning:** It is important to draw up an action plan to complete the task. For greater efficiency, we advise you to do this in writing or schematically.
2. **Setting Goals:** The strategy is aimed at developing skills in setting goals for learning material. Students with a goal to learn new material master it much faster than others.
3. **Compilation of Tables, Graphs or Diagrams:** This strategy helps to systematize the information received and your understanding of what has been learned.
4. **Thinking Out Loud:** It is important to learn to talk about the process of thinking, to pronounce the stages, and the results. An effective technique is to 'self-debate' the process of solving problems.
5. **Emotional Emphasis:** It is necessary to build associations and visual images associated with the study of new material. That is, when studying new material, it helps to associate the content with something positive or bright.
6. **Positive Attitude:** Our brain absorbs information like a sponge, both positive and negative. That is, by telling yourself that you cannot achieve, you are only programming your brain to resist learning. The most important thing is to believe in yourself and be able to rejoice even at small successes. Positive emotions improve the process of memorization and assimilation of information.
7. **Installation of Long-Term Memory:** Our beliefs affect the brain's ability to store information. It is advised to set a time bar for how long knowledge will be stored in your memory.
8. **The Application of Knowledge in Practice:** It is necessary to use new knowledge or new information in practice to solve problems and tasks.
9. **Self-Control:** It is necessary to conduct a self-test to determine your level of knowledge. To control the understanding of the information received, we ask ourselves questions, draw up tables of results, draw conclusions, and set questions for quizzes or exams.
10. **Correction of the Results:** It is necessary to compare the results obtained with those expected for further correction.

The results of training and testing have shown that the application of the above strategies in the learning process has a positive effect on learning outcomes, on the formation of self-reflection skills, and on the metacognitive skills of students.

Discussion Of Results

The study suggests that the use of metacognitive strategies develops metacognitive and reflection skills which, in turn, affects the ability to learn independently and to continuously self-educate. Rubin and Thompson (1996) define metacognitive strategies as methods aimed at managing cognitive activity, with the help of which a student independently controls the educational process. The authors refer to them as the following strategies: planning, goal setting, monitoring or self-monitoring, and evaluation.

Based on the analysis of literature, by processing the results of studies and the experience of pedagogical activities, we have identified effective metacognitive strategies. But in the course of the study, difficulties arose in controlling the formation of metacognitive skills in the application of metacognitive strategies and self-reflection skills, since there is no sound scientific method for assessing their formation.

Modern researchers offer different assessment methods. Hartman, Garner, and Alexander examine methods such as interviews, questionnaires, thinking out loud, and reports. Sarah Gonzalez and Olivia Bolivar believe that self-assessment of students plays an important role. For the accuracy of self-esteem, however, it often does not correspond to reality. Students can evaluate their results above or below real indicators. Self-esteem accuracy is influenced by the personal qualities of students, as well as their academic performance. Students receiving higher marks from teachers are more accurate than those receiving lower marks (González-Betancor, Bolívar-Cruz & Verano-Tacoronte, 2017).

Polkina (2015) suggests at all stages of development of reflection to ask leading questions of students: "What methods and techniques of work were more effective?", "At what stage was your activity more successful?", "What was understandable and what caused difficulties?", "What seems to be most important?". Kostons and de Koning (2017) claims that drawing up diagrams and sketches to assist the study of new material improves the accuracy of monitoring and assessing our understanding, as well as helping to increase the level of cognitive motivation and the applied mental effort, prompting the re-examination of information if necessary. However, we gave preference to digital indicators, as with their help it is easy to conduct a comparative analysis of the results. Therefore, testing, questionnaires, and monitoring methods were selected as assessment and control. The obtained digital indicators were processed and analyzed based on the method of mathematical data processing.

The data obtained allows us to conclude that increasing the effectiveness of student cognitive activity is associated with the development of metacognitive skills. Metacognitive skills help manage your cognitive processes and use metacognitive strategies to solve problems.

Based on the findings of pedagogical observations and questionnaires, it was found that students often use ineffective learning strategies and are ill-informed on which strategies really help in learning. But at the same time, most students are aware of the need and importance of developing metacognitive skills and reflection, being willing to master metacognitive strategies to increase the effectiveness of the cognitive activity.

The use of the monitoring knowledge method has demonstrated that the general level of students' metacognitive awareness is quite low, as students are not aware and often incorrectly evaluate their knowledge. The study also shows the relationship between academic performance and the level of metacognitive awareness among students, which is explained by the fact that reflection is an important component of successful student learning and self-education.

The scientific significance of the study lies in the following a) determining a set of fundamentally new and effective metacognitive strategies that increase the effectiveness of the learning process and self-education b) determining the scientific and methodological prerequisites and pedagogical conditions for the formation of metacognitive skills and c) identifying methods for assessing the formation of metacognitive skills and reflection skills. The materials and results of this study can be recommended for university teachers who teach foreign languages and can also be used in university practice.

Conclusions

The conclusions arising from the study have been presented below:

1. The foundation of self-education consists of metacognitive skills, self-planning skills, and the successful implementation of cognitive activities based on metacognitive strategies. Therefore, one pressing problem is the development of metacognition skills and reflection based on metacognition strategies. The priority is to teach students the ability to learn, to realize their own goals and to set specific tasks, to use different strategies and to choose the most effective.
2. The effectiveness of student cognitive activity is associated with the development of metacognitive skills and reflection, which help to manage their cognitive processes. Metacognitive skills form the basis of successful learning and self-education. Self-education is based on the development of the student's ability to reflect, which occurs only in the experience of the educational activity itself and in its constant reflective understanding. The development of metacognitive skills allows students to successfully cope with difficulties in non-standard and problem situations, ensuring the effectiveness of self-education.
3. The effectiveness of the process of forming students' metacognitive and reflection skills depends on pedagogical conditions, which are a combination of external and internal factors. Students should be involved in an independent search for new knowledge and the choice of effective ways to acquire it, as well as making informed decisions and choices they bear responsibility for. Metacognitive skills and reflection are important components for ensuring successful learning and self-education.
4. The low level of metacognition skills and self-reflection among students confirms the need to develop such skills based on metacognition strategies that, in turn, will increase metacognitive awareness and the effectiveness of cognitive activity and self-education.
5. There is an interconnection between academic performance and the level of metacognitive awareness and reflexive abilities among students, which is explained by the fact that reflection is an important component of successful student learning and performs the regulatory function of cognitive activity.
6. To increase the effectiveness of cognitive activities, knowledge of metacognitive strategies is needed to transform motivational intentions

into actions. Metacognitive strategies are necessary for achieving learning objectives and for the effectiveness of ongoing activities. The main acquisition of the use of metacognitive strategies in learning is the development of independent learning ability together with self-education.

An analysis of the relevant scientific literature and studies has confirmed that, for successful training, it is necessary to actualize metacognitive skills and reflection, as doing so performs a regulatory function in the process of obtaining education. Metacognitive skills and self-reflection are the basis of self-education and ensure training success. This study presents a fundamentally new and effective metacognitive strategy and defines the pedagogical conditions for the development of metacognitive skills and reflection to increase the effectiveness of cognitive activity and self-education. Prospects for further research may be associated with the creation of new technology for the formation of students' metacognitive skills, which will meet the requirements of modern society.

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