The importance of scientific and innovative activities in shaping ecological awareness among students

Obidjon Khamidov[1*] and *Akmal* Nazarov[1]

[1] Bukhara State University, Bukhara city 200100, Uzbekistan

Abstract. This article presents psychological, scientific-practical, and analytical data on the development of ecological awareness among young people and their orientation towards scientific and innovative activities. Additionally, it explores the factors that influence the development of ecological awareness among the youth, as well as the social, pedagogical, economic, and psychological factors that ensure the effectiveness of scientific and innovative activities. Furthermore, it studies the mechanisms for properly directing these activities.

1 Introduction

Today, significant attention is being paid to improving the mechanisms of scientific and innovative activities across all fields, applying the results of scientific research and innovative activities to production, and enhancing the efficiency of research and the quality of education. In this regard, prioritizing the reform of scientific and innovative activities in all areas, including higher education institutions, defining the strategic directions, and elevating the process of training highly qualified, independent-thinking personnel to a qualitatively new level is essential. Empirical research focused on developing the scientific and innovative activities of youth based on advanced modern educational technologies is a current necessity [1].

The World Intellectual Property Organization (WIPO), in collaboration with Cornell University and the International Business School (INSEAD), publishes the "Global Innovation Index" (GII) report, which annually ranks countries based on their scientific achievements, innovative potential, and innovation indicators. Accordingly, the task has been set to raise Uzbekistan's position in the "Global Innovation Index" (GII) ranking by 30 places by 2026. Notably, in the annual ranking results of the World Intellectual Property Organization, Uzbekistan has climbed 36 positions in the Global Innovation Index ranking, which evaluates countries based on 81 indicators, compared to its position in 2015 [2].

In our country, numerous effective measures are being undertaken to guide students and young people towards scientific and innovative activities. Notably, the adoption of legal and normative documents related to the scientific, creative, and innovation fields demonstrates a special focus on this area. The Presidential Decree of the Republic of Uzbekistan on

Corresponding author: rustambek852107@gmail.com

"Approving the Strategy for Innovative Development of the Republic of Uzbekistan for 2022-2026" has been issued. According to the decree, the annual state budget allocation for innovation and science has tripled compared to 2018, reaching 1.5 trillion soums. Since 2018, the annual International Week of Innovative Ideas—"Innoweek.uz"—has been organized, bringing together foreign innovation and scientific centers, investment funds, technology agencies, technoparks, and business incubators for a common purpose. These weekly events are evolving into monthly and yearly scientific-innovative activities [3].

Scientific and innovative activity is a part of human culture and is regarded as the most crucial path for societal development. It represents a unique form of personal activity in which individuals interact with the external world, fulfilling their needs, interests, and goals. In the modern global society and the process of informatization of scientific and innovative activities, developing new ideas and projects to implement scientific initiatives that address a country's most important strategic objectives remains a pressing issue.

2 Literature analysis and methodology

In the current era, the development of students' scientific and innovative activities and their orientation towards these fields are considered critical issues. Solutions to these problems can be achieved through the empirical study of individuals' existing capabilities, personal characteristics, and creative and cognitive processes.

Innovation is defined as the introduction of new organizational methods into any process. The concept of innovation first appeared in scientific and practical research in the 19th century. The new direction of the concept of "innovation" was applied by Austrian-American economist Joseph Schumpeter in the early 20th century through his analysis of "innovative combinations" and the resulting changes in economic development. Renowned economist Joseph Schumpeter is regarded as one of the first scholars to scientifically employ this term in the field of economics during the 1900s [8].

The concept of "innovation" conveys a precise meaning. As noted in the "National Encyclopedia of Uzbekistan," innovation encompasses the following meanings and concepts: "Innovation (from the English 'innovation' – introduced novelty, invention) – 1) funds invested in the economy to ensure the replacement of generations of technology and techniques; 2) innovations in fields such as technology, management, and labor organization, based on scientific and technological achievements and advanced experiences, as well as their application in various sectors and areas of activity."

Innovation is viewed not as any kind of innovation, but as a factor that significantly increases the efficiency of the existing system. Despite common misconceptions, innovations differ from discoveries, the difference between innovations and scientific discoveries and inventions is explained by the following concepts:

Science is the process of turning certain resources into knowledge and ideas. Innovation is the transformation of knowledge and ideas into funds.

Invention is the creation of new concepts.

Innovation involves emphasizing the practical significance of an invention and transforming it into a successfully marketable product.

A novelty is the result of intellectual activity and encompasses new strategies, business models, organizational structures, marketing methods, processes, technologies, products, or a complex combination of these elements.

Innovative activity refers to the set of scientific, technological, organizational, financial, and commercial measures aimed at commercializing accumulated knowledge, technology, and equipment.

The innovation process is a system encompassing structural frameworks and regularities. Studying the innovation processes, their functions, development patterns, mechanisms,

implementation technologies, and foundational management principles enables higher education institutions to organize their educational processes at the level of global standards, based on the advancements in modern psychology and pedagogy [8].

Research conducted by psychologists indicates that today's youth are more likely to achieve personal development if they possess self-confidence and a high level of self-esteem. Moreover, their development is significantly influenced by their ability to enhance their activities through their own efforts. This becomes particularly evident when they encounter failures, rate themselves poorly, or experience negative emotional states. Such youths seek unique ways, methods, and forms of self-understanding.

A sociological survey conducted by researchers to study interpersonal relationships and life interests among students revealed that out of 1,853 participants, the majority identified their sources of happiness as follows: a stable family with clearly defined goals (59%), sincere friends (52%), love (50%), and success in a beloved activity (44%).

The following factors, according to the survey, were significantly less influential: financial security (31%), personal life (20%), and values (9%).

As the famous writer Eric Berne noted, "The secret of our unhappiness is that we have too much leisure to think whether we are happy or not"[4].

The psychological conditions for directing students towards scientific and innovative activities include the following:

Activating the process of studying the foundations of science and innovation;

Searching for modern and new methods to increase young people's interest in scientific and innovative activities;

Enhancing the process of self-development and self-awareness.

The renowned American psychologist Carl Rogers studied the socio-psychological aspects of relationships, introducing innovations in interpersonal relations, the categories of individuals involved in this process, their attitudes towards innovation, their readiness to accept and understand its essence, and the classification of socio-psychological relationships with an innovative character among certain categories of individuals [6].

The psychological aspect of innovation was developed by another American scholar, Everett Rogers. He researched the classification of participants in the innovation process, their attitudes towards innovation, and their readiness to perceive it.

Russian psychologist V.A. Petrovsky's research identified the presence of unexpected, unconventional, and unadapted situations in the activities of young people. He described this as leading to a new stage of understanding and solving life problems, manifesting in active forms of creativity and cognitive processes [5].

According to researcher I. Stepanova, the concept of "innovation" is interpreted as a process that brings scientific and technical potential to life, resulting in new products and technologies [10].

According to B. Santo, he defines innovation as high-quality technological processes created for all areas.

For example, M.V. Volinkina explains innovative activity as a business activity related to obtaining new knowledge and its implementation by another participant of the educational market. According to the scientist, the necessary components of innovative activity include:

- use of knowledge to create new technologies;
- acquiring new knowledge;
- commercialization of innovative ideas.

Interpersonal relationships are often regarded as the foundation of scientific and innovative activities. In other words, the social environment of young people plays a significant role in directing them towards scientific and innovative pursuits [16].

M.V. Kroz's research views innovation activity as a process. Consequently, this leads to innovative changes in the social sphere within the existing culture. The concept of

"innovation" is defined by them as both novelty and the process of implementing this novelty in practice. Thus, differentiating between the concepts of innovation and novelty is a central idea in many scientific literatures [17].

Innovative social technologies refer to methods of innovative activity aimed at creating and materializing innovations in society, contributing to qualitative changes in various areas of social life, and ensuring the purposeful use of material and other resources in society. It is important to emphasize that the primary goal of social innovations is to address socio-psychological problems in modern society. Innovative activities in social relations are associated with finding new, more effective, and cost-efficient ways to solve social problems of the population.

The current era of educational development has introduced a new direction - innovative activity. The term "innovative education" and related research emerged in the 1960s in Western Europe and the United States. One of the key aspects of modern education is achieving an innovative character in pedagogical activity. In developed foreign countries, the issue of attaining an innovative character in pedagogical activity has been studied seriously since the 1960s [13].

In the works conducted by researchers such as V.V. Belous, F.E. Vasilyuk, O.Y. Zotova, and V.A. Slastenin, scientific investigations have been carried out on the utilization of innovative activities, innovating pedagogical practices, integrating innovative goals, and effectively implementing them in practice in pedagogical activities, through knowledge acquisition from pedagogical innovations developed both in foreign countries and within the republic [12,13,14].

The concept of "innovative education" (in English, "innovation" - introducing novelty, invention) refers to an educational approach that fosters the creation of new ideas, values, rules, the natural acceptance of values, norms, and rules created by others, as well as the potential to shape skills and develop abilities in learners. The technologies utilized in the process of innovative education are termed as innovative educational technologies or educational innovations.

The term "innovative education" was first introduced in 1979 at the "Rome Club". Educational innovations are classified into several types and exhibit various forms of manifestation.

The following are the main forms of innovation:

- new ideas;
- specific goals aimed at changing the system or direction of activity;
- unconventional approaches;
- unusual initiatives;
- advanced working methods.

In the field of education, as in all other domains, there are various perspectives on the nature of "novelty," "innovation," and the activities that articulate their essence.

If an activity is short-term and contributes solely to the improvement of specific elements within a system characterized by a stable structure, it is referred to as "innovation" (renewal) [12].

On the other hand, if an activity is carried out based on a certain conceptual framework and its outcome serves to develop a particular system or fundamentally alter it, it is termed "innovation" (introducing novelty). In scholarly literature, there is a distinct focus on distinguishing between the concepts of "novelty" (renewal, newness) and "innovation" (introducing novelty).

In essence, novelty involves a visible change, typically manifesting in new methods, techniques, technologies, and other forms.

In terms of their essence, there are specific differences between novelty and innovation. We can observe this distinction in the following table:

Table 1. The distinction between novelty and innovation

Novation	Innovation
1) is used within the framework of the current theory;	1) will be systematic, integrated and continuous;
2) limited in scope and time;	2) designs a new activity system in a given practice;
3) methods are updated;	3) the activities of the subjects are completely updated;
4) the result improves the previous system	4) new technologies are created;
	5) new quality results are achieved in the activity;
	6) the practice itself is updated.

According to scholars, educational innovations encompass the following changes:

- Transformation of pedagogical theories.
- Alteration in teaching practices.
- Renewal of student activities.
- Evolution of pedagogical technologies.
- Modification of educational content.
- Adaptation of teaching styles, methods, and tools.
- Reform in educational management.
- Revision of educational objectives and outcomes.

Researcher A.K. Belousova defines pedagogical innovation as the content that identifies previously unknown and unrecorded situations, outcomes, theories, and practices that contribute to the development and evolution of teaching and educational processes. N. Yusufbekova emphasizes the importance of approaching innovations from a pedagogical standpoint. Specifically, pedagogical innovations refer to the content that highlights situations where previously unknown or unrecorded phenomena in teaching and education have changed over time [11].

In this context, the author distinguishes between the following two important stages of innovative processes:

Generation of ideas manifesting as novelty (e.g., the development of specific products by a company or organization).

Wide-scale production of innovation (specific product). Educational institutions follow unique guidelines in establishing innovative processes. These include:

1. Gnostic-dynamic approach (according to it, pedagogues take into account pedagogical innovations, their types, creation, implementation, advanced pedagogical (educational) innovations created in foreign countries and their study, taking into account local conditions consistently acquire knowledge, skills, and competencies related to their use in practice, acquire experience in actively using pedagogical innovations in their activities).
2. Individual activity-oriented guidance (where educators achieve a specific proficiency in implementing pedagogical innovations in practical activities based on their individual abilities, capacities, and experiences).
3. Multi-subjective (dialogic) guidance (this guidance involves educators utilizing recommendations and guidance from colleagues, particularly those with extensive years of work experience, professional expertise, and practical knowledge of implementing educational innovations effectively, purposefully, and consistently).
4. Humanistic guidance (this guidance aims to emphasize the suitability of utilizing educational innovations in the teaching process by considering students' abilities, interests, curiosity, knowledge, skills, and competencies).
5. Individual-creative guidance (in which educators design teaching and educational processes based on individualized work, considering the content of the topic being

taught, the nature of the learning material, as well as their own abilities, qualifications, skills, and work experience). Innovative activity involves addressing complex issues that arise from the discrepancy between emerging societal demands and traditional norms or the reluctance to accept new goals emerging from evolving objectives.

According to researcher K.A. Farfiyev, pedagogical innovative activity manifests based on the following indicators:

- Embracing the philosophy of creative activity.
- Developing pedagogical research methods.
- Capacity to generate authorial concepts.
- Planning and implementing experimental work.
- Incorporating experiences of other researcher-educators.
- Collaboration with colleagues.
- Facilitating idea exchange and providing methodological assistance.
- Addressing and neutralizing contradictions.
- Discovering innovations and adapting them to one's context [18]

In essence, innovations represent a dynamic system for introducing novelty into relationships or processes. As a system, innovation inherently involves two fundamental aspects: first, the internal logic of the relationship or process; and second, the consistent development and mutual influence of the introduced novelty over a specific period.

In any innovation, the concepts of "new" and "novelty" are of significant importance. The novelty introduced into various relationships and processes manifests in different forms: specific, subjective, localized, and conditional ideas. Specific innovation involves altering or updating one element related to a relationship, object, or process. Subjective innovation reflects the necessity to update a particular object itself. Localized innovation describes the practical significance of the innovation being introduced for a specific object. Conditional innovation highlights the complex, progressive renewal facilitated by a set of specific elements within a relationship, object, or process.

3 Results

Empirical section. The quality and effectiveness of the educational process in higher education institutions depend not only on the forms and means of organizing education but also directly on the individual characteristics and psychological states of young people. Initially, we will examine the analysis of the results obtained from a special questionnaire developed by the author as part of our research. The aim of this questionnaire was to study the extent to which students' cognitive-creative processes have developed. Identifying these components in students provides the opportunity to develop essential knowledge, skills, and competencies crucial for their activities.

In accordance with the research problem, our questionnaire was designed to investigate students' cognitive-creative processes. These factors determine the mechanisms, dynamics, and stability of students' academic and scientific-innovative activities. We identified the differences and levels of manifestation of processes related to the development of new ideas among students. The initial phase of the empirical research was conducted with both experimental and control groups. It was found that the "practical thinking" method, which involves the implementation of selected new ideas, predominated. This method of thinking among students encompasses genuine innovative changes in practice, marking a period during which new ideas, hypotheses, and assumptions are formed and developed (see Table 2).

Table 2. Analysis of preliminary results obtained through the questionnaire "Identification of cognitive-creative components in students" (n=210)

Components	Before the Experiment (X±m)			
	Experiment Group	Control Group	t	p
Initiative thinking	10.3±0.7	11.1±0.8	-2.8	>0.005
Critical thinking	14.9±0.9	13.8±0.8	-2.4	>0.005
Managerial thinking	12.6±0.8	15.7±1.1	-2.3	<0.005
Practical thinking	16.6±1.4	15.9±1.3	-2.4	>0.005
Creativity	24.6±2.1	27.8±2.4	-2.1	>0.005

Explanation: *-p<0.05, **-p<0.01, ***-p<0.001.

The next factor in the questionnaire is "critical thinking," and it was noted that the results obtained in this regard were at a high level. Students with this characteristic demonstrated the ability to analyze information, draw conclusions, make adequate decisions, develop their own ideas, and expand their worldview.

The subsequent factor in our questionnaire, "managerial thinking," encompasses all stages of task execution. However, the development of cognitive activity is evident in positive attitudes towards others' achievements. In such students, factors such as the coordination of educational and scientific-innovative activities, their effective organization, and career orientation are implemented.

The lowest indicator in the questionnaire is observed in the "initiative thinking" factor. In such cases, students demonstrate the ability to solve problems and confirm scientific hypotheses in various fields while overcoming contradictions. Additionally, this factor is characterized by identifying problems, resolving conflicts, forecasting scientific hypotheses, and understanding the essence of the problem, as well as the ability to comprehend the essence of everything.

The factor of "creativity" in the research questionnaire recorded an average level of results. This is characterized by traits such as suitability of ideas, logical and creative thinking, curiosity about learning, enthusiasm for innovation, and selecting an adequate solution according to the goal. These factors are based on enabling students to identify scientific research problems, formulate hypotheses, identify research methods, and master knowledge about logical processes - analysis, synthesis, induction or deduction, abstraction, and others. Thus, the level of development of cognitive processes is linked to the psychological readiness for scientific-innovative tasks of students, adherence to established order and rules in learning and scientific research. Furthermore, the quality of performance, possession of independent research skills, identification of ways to implement innovations in professional activities, and the ability to monitor and evaluate the results of finding and evaluating solutions in decision-making are explained. Based on the results obtained above, the opportunity to create new goals in processes related to personal development, overcoming failures in learning and research activities, lack of self-confidence in decision-making, and creating new goals in processes related to personal development are provided.

In our research work, we will utilize the method developed by V. Boyko, the "Methodology for Determining the Level of Emotional Perception," and we will pause to fully analyze the statistical results obtained through this methodology. Through this methodology, we identified the levels of emotional perception that may occur or fluctuate during students' scientific-innovative activities. It is evident that situations that lead to chronic stress in students, affecting their emotional and personal capabilities, are prevalent today. This, undoubtedly, influences their learning activities and lifestyle. The recurrence of such situations has a lasting impact on students' psychological well-being and does not leave their educational and scientific-innovative activities unaffected. It is for this reason that we

decided to use V. Boyko's method in our research. Furthermore, it is worth emphasizing that psycho-correction programs have also been developed with the aim of addressing these factors (see Table 3).

Table 3. Results of "Methodology for determining the level of emotional exhaustion". (n=210)

Stages of stress	groups	mean (M)	Rang	Uemp.	p
Stress	1-stage	31.59	853	254	0.009
	4- stage	23.41	632		
Coping with psychologically harmful situations	1- stage	32.57	523.50	227.5	0.018
	4- stage	22.43	605.50		
Dissatisfaction with oneself	1- stage	30	810	297	0.239
	4- stage	25	675		
“Being cornered”	1- stage	29.76	803.50	303.5	0.010
	4- stage	25.24	681.50		
Anxiety and depression	1- stage	30.20	815.50	291.5	0.321
	4- stage	24.80	669.50		

Explanation: *-p<0.05, **-p<0.01, ***-p<0.001.

Following the utilization of this methodology, the comparative analysis of obtained data revealed significant differences in stress levels among students in stages 1-4 (statistical difference of 0.009). According to B. Pelman, such situations, resulting from discrepancies between the aspirations and expectations of any specialist, are highlighted as characteristic conditions specific to any field of activity. In stage 1 students, the average value for this factor was 31.59, while in stage 4 students, the result indicated a value of 23.41. Such a situation, in our view, is related to the socialization process of students. Additionally, students in stage 4 are considered to possess a greater acquisition of knowledge, skills, and abilities specific to educational and scientific-innovative activities compared to those in stage 1. The ability of students to analyze new information, to draw inductive and deductive conclusions, and to implement new creative ideas in practice is emphasized [14].

Table 4. The results of the correlation between cognitive-creative components in students and "Methodology for determining the level of emotional exhaustion" (n=210)

X^2 (Pirson)	Emotional stress	Emotional resistance	Emotional exhaustion
Initiative thinking	.105	.102	-.521*
Critical thinking	.141	.647*	.094
Managerial thinking	.120	.108	.167
Practical thinking	.192	.142	.107
Creativity	-.459*	.128	-.523*

Explanation: *-p<0.05, **-p<0.01, ***-p<0.001

In our research, we conducted an analysis of the correlation connections between emotional states and cognitive-creative components, which are important factors for enhancing students' psychological well-being and developing their scientific-innovative activities. The highest negative correlation in the obtained results was identified between "encouraging thinking" and "emotional perception" (-,0.521*). This suggests that if students have a high level of encouragement motivation in their educational and scientific-innovative activities, they are more likely to experience lower levels of emotional instability, a lack of understanding of others' situations, and social emotional alienation. Additionally, a positive correlation (,0.647*) was observed between the "critical thinking" and "emotional resistance" factors. If students exhibit an increase in critical thinking skills, they are more likely to

display negative emotional states such as inadequate self-assessment, difficulty in self-control, and an excessive tendency towards impulsive actions. The two factors, "creativity" and "emotional perception," from the methodology aimed at identifying cognitive-creative components and the methodology aimed at identifying the level of emotional perception, were found to be mutually correlated. It was confirmed that as the creativity traits in students increase, the development of emotional stability (-,0.459*) and emotional perception (,0.523*) factors also proportionally increase.

The purpose of analyzing these correlation connections is to identify factors that influence students' learning and scientific-innovative activities and to indicate the need for psychological correction of these factors [8].

Based on the theoretical-empirical analyses conducted on the research problem, we developed a model aimed at ensuring the psychological stability of students to enhance their scientific-innovative activities. This model includes specific criteria, levels, and indicators of stability. Furthermore, we designed a special psychological development program tailored specifically for students.

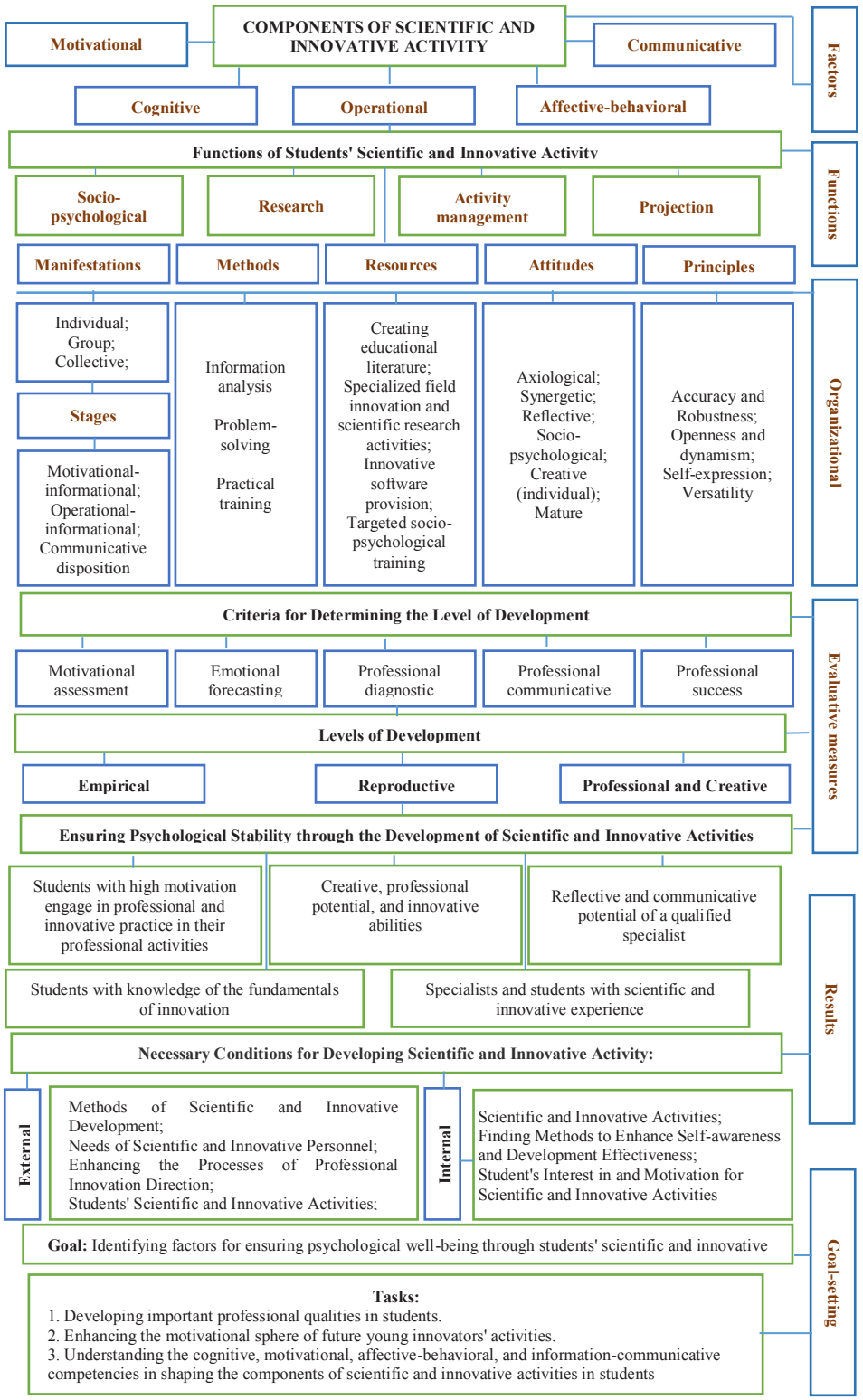
The organizational direction of the system of psychological support of students in their scientific and innovative activities covers methodological and didactic relations of academic subjects. The effectiveness of the implementation of this direction depends to a large extent on the components of the psychological and pedagogical sciences included in the educational process: elements of the motivational and need-based nature, explaining the purposes for which relevant scientific knowledge is used, emphasizing their necessity and importance in a particular professional in the situation; elements of the integration character consist of combining general education and special skills, abilities and knowledge, based on which they design innovative professional activities, select the content of academic subjects in the preparation of work programs, components of professional knowledge, skills, as well as their implementation methods; elements of a methodological nature consist in educating the system of beliefs and views as a basis for the formation of professional thinking and outlook; elements of a constructive (regulatory) nature (manifested in the construction of a vocationally oriented educational system). It is embodied in the methods and forms of training for the formation of a person's professional direction); elements of a differential nature (consisting of different educational content for different groups of professions, the nature of future professional activity depending on these conditions and conditions, various physiological and socio-psychological factors); elements of a humanitarian character (proposes from a semantic point of view the organization of the development of preparation for innovation and research activity, taking into account the personal principle and taking into account the topic of educational activity).

The components of psychological support for students, as well as for subjects engaged in innovative and scientific research activities, include the following: organizing and conducting competitions for the best innovative research projects, and providing specialized training aimed at enhancing their creative potential, abilities, knowledge, and skills.

The program for enhancing students' preparedness for innovative and research activities was implemented in a step-by-step manner:

Stage 1. Motivational and cognitive. This phase involves the psychological support for the adaptation process, fostering a positive attitude towards the chosen profession, raising awareness of the significance of students' personal and professional activities, and cultivating a desire among students to engage in innovative and research activities.

The tasks of this phase include:


COMPONENTS OF SCIENTIFIC AND INNOVATIVE ACTIVITY
Motivational
Communicative
Cognitive
Operational
Affective-behavioral
Factors
Functions of Students' Scientific and Innovative Activity
Socio-psychological
Research
Activity management
Projection
Functions
Manifestations
Methods
Resources
Attitudes
Principles
Individual; Group; Collective;
Stages
Motivational-informational; Operational-informational; Communicative disposition
Information analysis
Problem-solving
Practical training
Creating educational literature; Specialized field innovation and scientific research activities; Innovative software provision; Targeted socio-psychological training
Axiological; Synergetic; Reflective; Socio-psychological; Creative (individual); Mature
Accuracy and Robustness; Openness and dynamism; Self-expression; Versatility
Organizational
Criteria for Determining the Level of Development
Motivational assessment
Emotional forecasting
Professional diagnostic
Professional communicative
Professional success
Levels of Development
Empirical
Reproductive
Professional and Creative
Evaluative measures
Ensuring Psychological Stability through the Development of Scientific and Innovative Activities
Students with high motivation engage in professional and innovative practice in their professional activities
Creative, professional potential, and innovative abilities
Reflective and communicative potential of a qualified specialist
Students with knowledge of the fundamentals of innovation
Specialists and students with scientific and innovative experience
Results
Necessary Conditions for Developing Scientific and Innovative Activity:
External
Methods of Scientific and Innovative Development;
Needs of Scientific and Innovative Personnel;
Enhancing the Processes of Professional Innovation Direction;
Students' Scientific and Innovative Activities;
Internal
Scientific and Innovative Activities;
Finding Methods to Enhance Self-awareness and Development Effectiveness;
Student's Interest in and Motivation for Scientific and Innovative Activities
Goal: Identifying factors for ensuring psychological well-being through students' scientific and innovative
Tasks:
1. Developing important professional qualities in students.
2. Enhancing the motivational sphere of future young innovators' activities.
3. Understanding the cognitive, motivational, affective-behavioral, and information-communicative competencies in shaping the components of scientific and innovative activities in students
Goal-setting

- Contributing to the successful adaptation of first-year students;
- Developing the fundamental concept of the profession and forming the skill of choosing it;
- Formulating ideas about oneself as a subject of innovative professional activity;
- Assisting in establishing interpersonal relationships within the group and creating the necessary conditions for the active display of personal qualities in the initial stage of professional training;
- Identifying the correlations between planned goals and actual needs, as well as between future professional ideas and personal concepts;
- Cultivating the need for independent work, which is aimed at shaping oneself as a future specialist;
- Forming a positive attitude towards the profession, professional image, and professional identity through organizing extracurricular activities.

In these training sessions, students connect their abilities with the requirements of their chosen profession. They study the professionograms and psychograms of relevant specializations, gaining information about the nature of the work, working conditions, professional tasks, and the requirements placed upon them. This knowledge allows students to form a clear understanding of themselves as future professionals in their field. The implementation of psychological training programs enhances students' motivation to engage in innovative and research activities. It also helps develop skills in introspection, fostering accurate self-assessment, and improving the ability to apply their knowledge effectively in a professional context.

Stage 2. Cognitive-Operational: This stage is designed to develop the cognitive and operational components of future socio-psychological readiness for innovation and research activities among students.

The objective of this stage is to facilitate students' mastery of the knowledge concerning the methodology of scientific research, as well as the organization and implementation of innovative and research activities.

The tasks of the Cognitive-Operational stage include:

- Assisting students in understanding the fundamentals of innovative and research activities.
- Developing goals related to the essence, characteristics, types, and methods of implementing innovation.
- Familiarizing students with innovative transformations, as well as the fundamentals of innovative and research activities.
- Formulating basic concepts in the field of forecasting and modeling projects.

Stage 3. Emotional-Expressive and Communicative-Informational: This stage encompasses methods for developing the emotional-expressive and communicative-informational components of students' readiness for innovation and research activities.

The objective of this stage is to develop abilities related to emotional regulation, overcoming fears, and coping with challenges, as well as enhancing self-awareness and self-expression skills through the practical application of achieved results.

The tasks of the Emotional-Expressive and Communicative-Informational stage include:

- Developing self-regulation skills.
- Formulating presentation skills for innovative projects and proposals.
- Developing skills in communication, representation, and empathy

Studying the system of psychological support in the higher education system assists in preparing students for their scholarly and innovative activities, fostering the development of a resilient individual capable of generating and implementing new ideas. Psychological

support during the period of professional preparation plays a significant role in shaping the students' readiness from a vocational perspective, particularly in the provision of educational programs tailored for innovative research activities. These programs aim to teach students the necessary knowledge and skills, including supportive, critical, managerial, and practical thinking styles.

4 Conclusion

In summary, it is noteworthy that the development of scientific and innovative activity in students is influenced by the need to develop necessary knowledge, skills, and competencies, as well as the emotional stability and motivation for success. Furthermore, the sufficient development of emotional and expressive qualities has been identified as influential. Additionally, it has been established that the success of addressing various challenges in the development of scientific and innovative activity relies on motivational, cognitive, operational, goal-oriented, independent thinking, and communicative aspects. The development of students' scientific and innovative activity contributes to ensuring pedagogical-psychological effectiveness through analyzing the impact of the integration of their learning motivations. Indicative indicators such as motivation, commitment to the profession, creativity, initiative in seeking and introducing innovations, psychological readiness for innovative activity, and the necessity of self-assessment play a crucial role in identifying students' readiness for scientific and innovative activity, indicating a current unresolved issue in research. According to the analysis of empirical results, guiding students towards scientific and innovative activity involves utilizing methodological, theoretical, psychological, and productive guidance, encouraging them to think critically, analytically, strategically, operationally, and creatively.

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