DOI: https://doi.org/10.37547/mesmj-V7-I4-74 Pages: 657-670

MENTAL ENLIGHTENMENT SCIENTIFIC – METHODOLOGICAL JOURNAL

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http://mentaljournal-jspu.uz/index.php/mesmj/index


# DESIGNING THE FORMATION OF SCIENTIFIC AND CREATIVE POTENTIAL OF MODERN MASTER'S STUDENTS WITHIN THE FRAMEWORK OF A METHODOLOGICAL APPROACH

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## ABOUT ARTICLE

**Key words:** master's student, student, design, scientific and creative potential, creativity, scientific potential, formation, model, concept.

**Received:** 01.05.26
**Accepted:** 02.05.26
**Published:** 03.05.26

**Abstract:** The relevance of the studied problem lies in the research activity aimed at developing a model for the formation of scientific and creative potential of master's students in higher education within the framework of a methodological approach. In order to integrate master's students into the innovative educational environment of a higher education institution, it is necessary to unlock and develop their scientific and creative potential. The theory and practice of higher education pedagogy consider that the conceptual foundations of the process of forming the scientific and creative potential of master's students are not sufficiently substantiated. Therefore, it is necessary to address the issues of developing a concept for the formation of master's students' scientific and creative potential. The aim of the study is to examine the theoretical and practical aspects of designing a model for the formation of scientific and creative potential of modern master's students. Designing the formation of master's students' scientific and creative potential is considered a leading approach to studying this problem. To implement this design, the following approaches and principles were selected as the conceptual basis: systemic-target approach and the principles of consistency and

goal-setting; personality-oriented approach and the principle of socio-cultural development; subject-oriented approach, which includes the principle of the subjectness of the individual; anthropological approach based on human nature, which includes the principles of eventfulness, conformity to nature and culture; synergetic-integrative approach and the principles of differentiation, synergy and integration; competence-based approach.

The subject-oriented approach, based on the principle of developing the subjectness of master's students, is substantiated in this study as the leading methodological approach. The article provides a brief analytical description of the scientific works of foreign researchers on the issues of forming scientific and creative potential. The main results of the study are focused on designing the process of forming the scientific and creative potential of modern master's students. Within this framework, indicative indicators (indicators) ensuring the effectiveness of this process have been developed, and the necessary conditions for the development of master's students as subjects of scientific-research and scientific-practical activities have been substantiated. The theoretical and practical significance of the article is determined by the development of the main components of the formation of scientific and creative potential and their evaluation indicators within the framework of a methodological approach.

**Introduction.** Nowadays, interest in and demand for education, particularly higher education, is steadily increasing. This has led to a significant rise in the number of higher education institutions. According to current data, the total number of state and private higher education institutions in Uzbekistan exceeds 200. Higher education in our country is structured in two stages, including bachelor's and master's degree programs. At present, master's degree education is one of the most demanded levels of higher education.

As noted by A.S. Robotova, the modern training of master's students involves specific problems and challenges [15]. The professional preparation of master's students should be carried out in an educational environment based on digital technologies and innovation. In particular, A.Yu. Gorshenin substantiated the appropriateness of innovative activities for master's degree students [4]. In the work of F.G. Mukhametzyanova, emphasis is placed on the

need for modern master's degree programs to meet contemporary requirements, as well as on the development of master's students' independence and activity [11, 12].

Today, the educational environment being created in higher education institutions must be oriented toward ensuring the formation and development of master's students as active subjects of scientific research and scientific-pedagogical activities. Identifying and developing master's students' scientific and creative abilities is crucial for their effective integration into the innovative educational environment of higher education institutions. In order to ensure the integration of master's students into the innovative educational environment of the university, it is essential to develop their scientific and creative potential.

However, in the theory and practice of higher education pedagogy, the conceptual foundations of the process of forming the scientific and creative potential of master's students are not sufficiently substantiated. At the master's level of higher education, professors and teachers of higher education institutions should be interested in making more effective use of project-based and creative methods, forms, and technologies for teaching master's students. To achieve this, there must be a recognized need for an innovative educational environment not only among university administration and faculty members, but also among the students themselves. It is necessary to attract and support creative and innovative learners, as well as the university's scientific and pedagogical resources. This, in turn, requires addressing the issues of developing a concept for the formation of master's students' scientific and creative potential.

**Literature Review.** Every higher education institution must clearly and systematically create an innovative educational environment for students at the master's level. Such an environment includes a complex of interrelated components such as material and technical support, spatial-objective factors, socio-economic factors, interpersonal relations, and the interaction between objects and subjects. All these factors are interconnected, complement one another, and influence each subject of the educational environment as an object.

However, the question remains: to what extent do these factors contribute to the development of an innovative educational environment and the scientific-creative potential of master's students, and what conditions do they actually create? Modern foreign and local scientific literature does not provide clear answers to these questions. This situation is further complicated by the fact that a well-developed concept for the formation of master's students' scientific and creative potential has not yet been created.

Let us briefly analyze the works of foreign researchers on the problems of forming scientific and creative potential. For example, O.L. Nikolskaya developed and tested a concept

for actualizing the creative potential of students and teachers and its implementation in the educational process [13]. According to L.F. Alekseeva, creative abilities can only be developed through the process of creative activity, and readiness for innovative activity can only be formed through the process of innovative activity itself [2]. At the same time, innovations are understood as "the process of creating various novelties that bring about significant changes in social practice and their implementation" [18]. For our study, the research conducted by N.P. Kirillova and Ye.G. Leonteva on the development of students' and teachers' creative potential provides valuable insights [7]. A.I. Savenkov and M.A. Romanova reveal the main factors in the development of a person's intellectual-creative potential and defend the idea that intellectual-creative development occurs under the influence of a small social environment and imitation, while general talent can transform into relevant creativity [16]. O.A. Drobisheva and I.V. Smolyarchuk identified the psychological and pedagogical conditions for the development of students' creative potential using the example of a pedagogical college [5]. The issues of studying and developing the scientific potential of students in medical higher education institutions were explored by I.G. Terentev and others [20]. Ye.A. Gnatishkina and N.A. Gerdt developed a model for the formation of professional-creative potential among students of creative professions and proposed the following structural components of the model: motivational-target, content-related, procedural, and reflexive-evaluative [3].

Various aspects of the problem of developing master's students' scientific and creative potential are reflected in a number of foreign studies, including issues related to the training of new master's degree holders [26], the role of creativity in teaching [29], problems of innovative pedagogy [28], new opportunities of a multidisciplinary approach [25], and teaching technologies based on a creative approach [27].

However, in the above-mentioned works, scientific and creative potential is often viewed either side by side or as synonyms. There is an insufficient number of studies in psychological and pedagogical literature that properly define the concept of scientific-creative potential.

The search for an answer to the question of what the concept of scientific and creative potential of modern master's students actually entails was directly related to the analysis of the problems of its formation at the master's level of education and the identification of existing "gaps" in this area.

In this direction, we identified problems reflected in a number of studies. For instance, in the scientific research of G.K. Ayjanova and A.A. Ergazina, methodological approaches to the formation of an integrative model of a master's degree program graduate are scientifically and

theoretically substantiated, and the conceptual foundations of this process are clarified [1]. L.V. Konstantinova conducted a scientific analysis of the problems associated with the development of the master's level in the process of higher education reform, treating it as an important factor influencing the quality of higher education [8]. The works of I.N. Kim and S.V. Lisienko highlight the place and role of the master's level in the strategic development of higher education institutions [6]. V.N. Kuznetsova presented the problems of the formation and development of modern master's programs in higher education in her research [9]. In the scientific studies of V.V. Markin and V.V. Voronov, reflections on the problems of training highly qualified personnel are presented within the discussions on the Bologna Process and its quality [10]. T.D. Skudnova's research examines the problem of ensuring the quality of multi-level higher education within the anthropological paradigm of master's education, that is, in the context of modern educational conditions [17]. S.E. Starostnina and Yu.S. Tokareva developed approaches to designing master's degree programs within the framework of updating the state educational standard of higher education [19]. V.O. Fedorovich's works identify the reasons for the insufficient effectiveness of master's degree programs and define the strategic directions of master's education in higher education institutions [21]. V.P. Ovechkin and co-authors reveal the structure and characteristics of preparing master's students for innovative pedagogical activity [14]. Management and methodological aspects of higher education development are reflected in the work of L.A. Shipilina [24]. In I.F. Filchenkova's dissertation, the methodology and technologies for involving university teachers in innovative activities at the master's level were developed and adapted [31].

In the framework of this study, the scientific and creative potential of master's students is interpreted as an important component of a master's professional activity. It is viewed as a set of personal qualities, abilities, and opportunities that determine a person's readiness to successfully carry out scientific-research and scientific-practical activities.

To design a model for the formation of master's students' scientific and creative potential, we took as a basis the idea of modeling the formation of creative potential among students studying in creative professions.

Thus, the phenomenon of the concept is characterized by its multidimensional nature. Based on the analyzed sources and data, the concept of "master's student's scientific and creative potential" can be defined as a synergetic unity that integrates a number of the individual's interconnected potentials. In our opinion, the foundation of a master's student's scientific and creative potential is his or her personal creative potential, which serves as a measure of the subject of activity's capabilities, complex creative abilities, and strengths. It also

represents the subject's readiness for creative self-development and self-realization based on extra-situational activity and often unstimulated motivation. In general, this manifests itself in the subject's ability to surpass others in their attitude toward creativity and the productivity of their activity, in setting a new level of work for them, and in the subject's striving for change across various types of activity.

In this context, scientific potential implicitly incorporates creative potential within itself and differs from it by the subject's orientation toward seeking scientific truth and working within the methodological field of research.

**Methods.** The results of this study reflect the author's attitude toward the phenomenon under investigation through several theoretical approaches that form the ideological basis for the formation of master's students' scientific and creative potential.

As the methodological foundation of the study, the following approaches were used: systemic-target, personality-oriented, subject-oriented, anthropological, synergetic-integrative, and competence-based approaches. These approaches enable a comprehensive study of the process of developing master's students' scientific and creative potential:

Table 1

Methodological Approaches to Designing the Formation of Master's Students' Scientific and Creative Potential

| No. | Approach | Components of the Approach |
|---|---|---|
| 1 | Systemic-target approach | Requires viewing the process of forming master's students' scientific and creative potential from the perspective of its principles — comprehensiveness and integrity. |
| 2 | Personality-oriented approach | Recognizes master's students as the central subject in the process of forming and developing a professional personality based on the principle of socio-historical development. |
| 3 | Subject-oriented approach | Considers the master's student as a subject of scientific-research and scientific-pedagogical activity who is capable of self-development, self-activation, and manifesting his or her own potential. This approach includes the principle of the subjectness of the individual. |
| 4 | Anthropological approach | Relies on a humanistic model of education that incorporates the principles of eventfulness, naturalness, and conformity to culture. |
| 5 | Synergetic-integrative approach | Involves the unification of phenomena and foundations at the beginning of the process in order to enhance efficiency and productivity as a result of the |

| No. | Approach | Components of the Approach |
|---|---|---|
| | | activity. It includes the principles of differentiation, synergy, and integration. |
| 6 | Competence-based approach | Aims to direct the master's educational process to the maximum extent toward the realities of future professional activity. |

The theoretical and methodological basis for analyzing the concept of developing master's students' creative potential is formed by the subject-activity approach, which reveals the essence of the individual as a subject. That is, the master's student is viewed not merely as a passive recipient of knowledge, but as an active, interactive, inquiring, and developing person.

In studying the process of developing master's students' creative potential, the following methods were used: theoretical analysis of pedagogical and psychological literature, observation, expert evaluation, interviews, and analysis of scientific and practical works carried out by master's students (articles in scientific journals, internship reports, and others).

**Results.** We have attempted to design a model of master's students' creative potential within the framework of the content of professional training in higher education institutions.

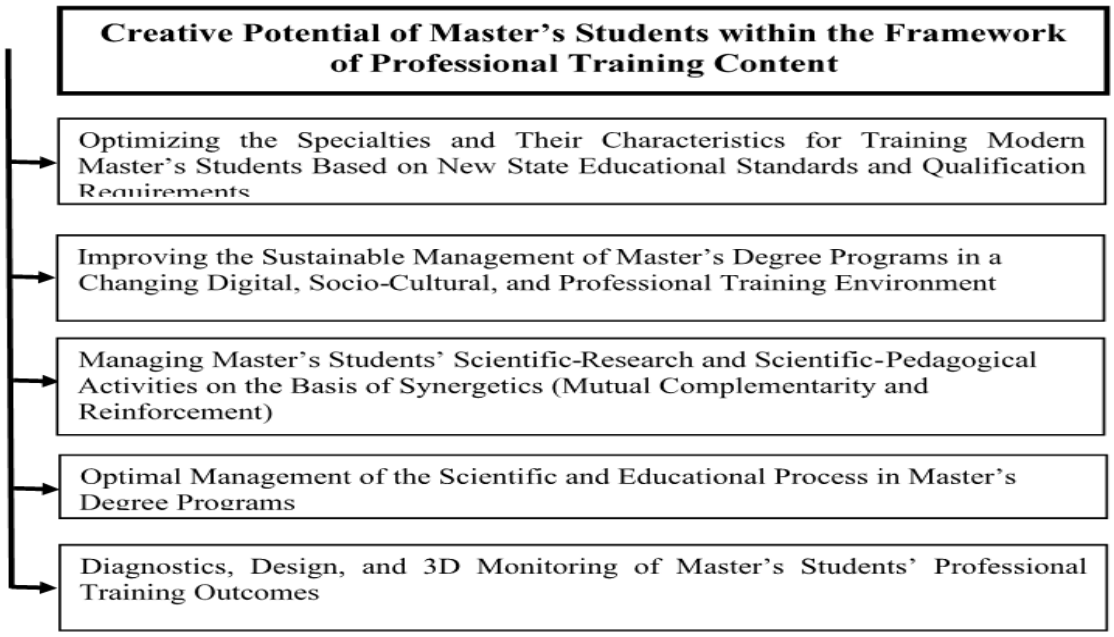


**Figure 1. Model for the Development of Master's Students' Creative Potential within the Framework of Professional Training Content**

The design of the model for the development of master's students' creative potential in the conditions of professional training in higher education (hereinafter referred to as "the model") included several stages:

- Determining the purpose of designing the model;

- Comparative analysis of State Educational Standards (SES), qualification requirements, and employers' demands;
- Development of the concept for the formation of master's students' creative potential;
- Identification and selection of the model's structural components for developing master's students' scientific and creative potential at the main levels (above average and high).

The conceptual basis of the model is formed by the following approaches and principles:

- Systemic-target approach and the principles of consistency and goal-setting;
- Personality-oriented approach and the principles of socio-historical development;
- Subject-oriented approach and the principle of developing the subjectness of master's students and university professors;
- Anthropological approach and the principles of eventfulness, naturalness, and cultural conformity;
- Synergetic-integrative approach and the principles of differentiation, synergy, and integration aimed at enhancing outcomes through the unification of resources and forces;
- Competence-based approach and the principles of developing professional competencies in master's students.

As the leading approach, we identified the subject-oriented approach based on the principle of developing the subjectness of master's students as active subjects of scientific-research and scientific-pedagogical activities.

The purpose of the model for the formation of master's students' scientific and creative potential is to create (facilitate) the conditions necessary for developing their readiness for self-development as subjects of educational-professional activity, as well as subjects of scientific-pedagogical and scientific-research activity.

The task of the model is to develop master's students as subjects of sustainable development and as subjects of scientific research and scientific-pedagogical activity within the university's dynamic digital, socio-cultural, and educational environment.

Target group: master's students, bachelor's graduates entering master's programs, production and industry specialists, professors and teachers, and administrative-management staff.

Competitive advantages of the model include the following:

- The ability to develop, implement, and apply master's students' scientific and creative potential in their professional activities;

- The capacity to identify and predict risks and obstacles in the development of master's students' scientific and creative potential;
- The readiness to use adaptive (flexible) teaching technologies as pedagogical support in studying and developing master's students' activity;
- The use of creative and supportive technologies in preparing master's students for professional activity helps accelerate and optimize the second level of higher education, ensure high efficiency and productivity of the educational process, and significantly reduce the cost of training master's students;
- The ability to manage and improve the process of developing master's students' scientific and creative potential, as well as the readiness to work innovatively.

The educational outcome of the model is the integration of master's students' competencies as the ability and full readiness to successfully and effectively carry out scientific-research and scientific-pedagogical activities at the university.

The level of master's students' achieved results is discussed and evaluated during the defense of the master's thesis as part of the final state attestation. In this process, the question-and-answer session should be of a discussion nature, and the thesis may be prepared as a study of a real scientific, educational, or research problem.

Specific features of the model include:

- Improving the multi-level model of higher education (bachelor's, master's, doctoral, and others) from the perspective of field switching and flexibility;
- Focusing on the training of participants in sustainable development who are capable of adapting to risks, barriers, and innovative changes;
- Searching for new innovations and finding optimal solutions for innovations known as innovatics;
- Flexibility and adaptability of the educational program in accordance with labor market demands and the needs of master's students;
- The ability to design individual educational trajectories and pathways for master's students;
- Problem-creative and synergetic-interdisciplinary concepts for master's degree programs.

Model Structure. The model is structural-functional and includes a number of dynamic components:

1. Motivational-target component — aimed at developing motivation and incentives for achieving success. The indicative indicators of this component include the

student's achievements in scientific research: grants, named and state scholarships, patents, competition wins, active participation in scientific and practical conferences, etc., as well as the dynamics of interest in self-activation and self-expression, and the need to participate in and complete research and creative projects.

2. Content-related component — focuses on meeting the requirements for master's students. Indicators include collective work on creative research assignments, active participation in competitions and scientific-practical conferences, involvement in forums and exhibitions, and work on collectively funded grant projects.

3. Procedural-technological component — encompasses methods, flexible technologies, and forms for the development of scientific and creative potential. Indicators include the use of flexible technologies of active and problem-based learning, individual educational pathways for master's students, and master's degree programs.

4. Reflexive-evaluative component — describes the results of the process of developing master's students' scientific and creative potential. Indicators include the individual's self-assessment and reflection, analysis, and a set of assessment tools for simultaneous verification of knowledge and skills.

The formation of master's students' scientific and creative potential requires compliance with the following organizational-pedagogical conditions:

- Reliance on a systemic-target approach in organizing master's students' scientific and creative processes based on interdisciplinary research;
- Creation and support of a creative innovative educational environment for master's students in all structural units of the higher education institution;
- Implementation of a subject-oriented approach in the professional training of master's students, which develops through subject-to-subject collaboration with professors and teachers;
- Use of flexible, innovative teaching methods, forms, and technologies aimed at developing independent creative activity, increasing motivation, and providing incentives for master's students and their scientific supervisors;
- Creation of a competence-based and synergetic educational environment in higher education institutions that enables the establishment of new interdisciplinary connections and integrations;
- Application of a flexible management model for managing the process of developing master's students' scientific and creative potential;

- Creative use of flexible technologies of the pedagogical process in providing psychological and pedagogical support for the professional and personal growth of master's students.
- Assisting in the independent design of individual educational trajectories and directions for master's students;
- Ensuring continuous support for master's students from young researchers, doctoral candidates, independent researchers, faculty members, and industry representatives, as well as organizing mentoring activities by master's students for bachelor's students based on the principle of gradual and successive transfer of knowledge.

Result of mastering the model. Master's students with developed scientific and creative potential under this model should be ready, as subjects of professional activity, to solve a range of tasks in various professional fields:

- Research activities: As a subject of research activity, the ability to analyze, systematize, and generalize research results using a set of research methods employing modern technologies, and readiness for scientific cooperation within international research communities;
- Scientific-pedagogical activities: As a subject of professional pedagogical activity, the ability to organize modern education in higher education institutions based on the optimal combination of academic and digital teaching technologies, relying on flexible educational technologies, supporting individual educational trajectories and directions, and engaging in creative and effective collaboration with local and international colleagues in mastering the network programs of the master's level.

We use this model in the professional training of master's students in technical specialties at higher education institutions. In our view, pedagogical support is one of the flexible technologies for enhancing the effectiveness of this model. The effectiveness of using this model is reflected, on the one hand, in the dynamics of growth in indicators of the formation of future master's students' scientific and creative potential, and on the other hand, in the increased demand for our graduates in the labor market.

The model for developing the scientific and creative potential of master's students, developed and schematically described in this article, was designed within the context of training master's students in technical specialties at higher education institutions and aims to improve the effectiveness of modern master's programs. The design of the model is associated with the introduction of a new State Educational Standard for the master's level of professional training, the implementation of which ensures an improvement in the quality of training of

modern master's students. The challenges in designing this model were related to an insufficient understanding of the role of the concept of scientific and creative potential in the formation and development of modern master's students as subjects of research and scientific-pedagogical activities. This issue lies within a problem-discursive domain and requires further study.

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