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FORMATION OF RESEARCH COMPETENCE AS A FACTOR OF PROFESSIONAL SELF-DEVELOPMENT OF MEDICAL STUDENTS

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Abstract. At the present stage of educational development, the quality of professional training for future medical specialists has become a matter of paramount importance. The dynamic progress of medical science continuously broadens the range of competencies that medical students must acquire. This article examines the role of research competence in the professional preparation of future physicians and its functions within the system of higher medical education. The study defines research competence as an integrated personal quality encompassing specialized knowledge, research skills, and a value-based attitude toward scientific inquiry. Six functional components of research competence are identified—scientific and worldview, moral, communicative, informational-operational, educational, and personal-developmental—each of which contributes to students' professional and personal self-development. The study highlights the interrelation between these functions and structural components of research competence and proposes key criteria and indicators for assessing its formation: research motivation, scientific style of thinking, technological readiness, and creative activity.

Keywords: research competence, medical education, self-development, professional training, research culture, higher education.

Introduction

At the current stage of educational development, the quality of professional training for future medical specialists has become a matter of paramount importance. The rapid pace of innovation in the medical field continuously broadens the range of professional competencies that medical students must master. The integration of a **competency-based approach** into professional education ensures the optimal achievement of productive, personal, and social learning outcomes. Within this framework, the **formation of research competence** is recognized as a key priority in training highly qualified specialists in higher medical education.

Consequently, the learning process in medical institutions should primarily facilitate the development of a medical professional's personality—one capable of ongoing self-improvement, self-development, and self-education—while also fostering students' research competence.

Materials and Methods

Research competence is conceptualized as an integrated personal quality of a medical student, representing the unity of specialized knowledge, research skills, and scientific inquiry abilities, combined with a value-based attitude toward research outcomes. It manifests in the capacity to apply research competencies in medical practice and constitutes an essential element of the student's professional culture.

The identification of structural components of medical students' research competence enabled the formulation of its main functions, demonstrating that it acts as a key factor in the professional self-development of future physicians. Considering the diversity of content and forms of students' research activities—shaped by interpersonal interactions, communication, value orientations, and opportunities for self-development—it is necessary to examine the **functional components of research competence** as an integral part of the pedagogical process of shaping a competent medical professional [2].

The main **functional components** (or functions) of a medical student's research competence include:

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1. Scientific and worldview,
2. Moral,
3. Communicative,
4. Informational and operational,
5. Educational, and
6. Personal-developmental functions [4].

Each of these components contributes to the student's self-development cycle within professional activity. Their content and significance are briefly outlined below.

Results. The **scientific and worldview function** of research competence establishes a systemic understanding of the interconnections among clinical disciplines. It enables students to view phenomena from multiple perspectives, achieve a holistic understanding, and develop methodological concepts such as the interaction between healthcare professionals and patients.

Through addressing research problems, medical students develop an integrated perspective on the nature and structure of scientific knowledge. By identifying essential professional aspects across various phenomena, they formulate generalizations that serve as mechanisms for organizing scientific knowledge. These generalizations provide methodological tools for explanation, prediction, and problem-solving—not only for the tasks from which they emerge but also for a wide range of professional challenges.

This function thus encompasses not only the acquisition of knowledge about specific phenomena and research methods but also self-reflection—an awareness of one's own psychological characteristics and professional competencies as a future medical practitioner.

Discussion. The **communicative function** of research competence addresses the essential human need for professional interaction. During research-based learning, students engage in communication with peers, university instructors, and patients, such as within student scientific circles—for instance, the Russian language club *"Russkoye Slovo."* This communication facilitates the exchange of academic information and research experience, collaborative problem-solving, and dialogue between differing perspectives or "cultures."

Within such communicative environments, medical students acquire professional interaction skills that stimulate creative self-development processes, including self-determination, self-awareness, self-organization, self-regulation, self-education, and self-realization. The intensity and effectiveness of these processes depend on students' intellectual, psychological, and linguistic characteristics, as well as their level of professional culture.

The **moral function** of research competence reflects the ethical dimension of students' research activity. It presupposes their understanding of research as an expression of responsibility, care, and respect toward patients, as a manifestation of professional ethical creativity, and as a foundation for resolving ethically significant professional challenges. Moreover, it promotes students' awareness of the necessity of research for their own creative self-realization, professional identity formation, and social integration.

The **educational function** of research competence lies in the acquisition of professional knowledge, skills, and abilities through research practice. This process is influenced by several factors: intellectual capacity, motivation, technological readiness for research, material and technical support, the complexity of professional tasks, and the cultural and professional environment. The implementation of this function enhances students' processes of self-determination, self-knowledge, self-regulation, and self-education.

The **personal-developmental function** manifests in the medical student's ability to internalize professional norms and values, and to realize individual aspirations through active research engagement. It reflects the actualization of inner potential and the integration of personal interests with professional growth. Harmonious alignment between research activity and students' personal motivations, the accessibility of professional tasks, freedom of choice, and satisfaction with outcomes constitute essential conditions for realizing this function effectively.

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The **informational and operational function** interconnects with all other components of research competence. It involves preparing students to efficiently search for, process, and analyze both textual and digital information; to navigate vast information flows; to identify the essential; and to formulate problems and research plans. This function enables effective engagement in processes of self-determination, self-organization, and self-education. Its significance for students' creative self-development will continue to increase amid the growing complexity of information flows and the ongoing differentiation and integration of scientific knowledge [1].

The described functional components, in close interaction with the structural elements of research competence, allow for the systematization of its manifestations—reflecting students' creation of material and spiritual values of both subjective and objective importance. These processes of transformation and self-development highlight the role of **research culture** [3] as a critical factor in the creative self-development of medical students.

As a result, the following **criteria and indicators** of research competence formation were identified, capturing the specific nature of creative self-development processes:

- motivation for research activity,
- technological readiness for research,
- scientific style of thinking, and
- creative research activity.

These criteria were validated through experimental studies and statistical analysis, identifying three measurable indicators for each criterion (see Table 1).

Criterion	Indicator 1	Indicator 2	Indicator 3
Motivation for Research	Interest in and positive attitude toward research activities	Awareness of the importance and relevance of research for professional development	Persistence and responsibility in performing research tasks
Scientific Style of Thinking	Ability to analyze, synthesize, and generalize scientific data	Capacity for critical and logical reasoning	Application of theoretical concepts in solving practical medical problems
Technological Readiness for Research	Mastery of research methods and data collection techniques	Proficiency in using information and digital technologies	Ability to independently design and conduct a small-scale research project
Creative Research Activity	Initiative and originality in research tasks	Ability to generate new ideas and hypotheses	Integration of interdisciplinary approaches and innovative thinking in professional practice

Results and Conclusions. **It should be noted that first-year students are only beginning to acquire the fundamentals of the medical profession. At this stage, their cognitive, motivational, and practical readiness to engage in research and professional activity is still in formation. In the system of higher education, the training of a medical specialist is aimed at developing both** general and professional competencies**, which encompass theoretical knowledge, motivational orientation, and practical preparedness for the performance of professional functions. Thus, the early years of medical education play a pivotal role in shaping the student's professional identity and cultivating the prerequisites for research competence.**

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Research competence, as demonstrated in our study, represents an integrative indicator of the quality of professional training in medical education. It is founded upon the **interrelation of personal values, research abilities, and professional qualities** that determine the student's orientation toward the practice of medicine and the resolution of professional tasks. Within this framework, the formation of research competence serves not only as an academic objective but also as a **personal and professional transformation** process that equips future physicians for reflective practice, lifelong learning, and evidence-based decision-making.

Based on the results of the **diagnostic (ascertaining) stage of the pedagogical experiment**, the levels of research competence among medical students were distributed as follows:

Heuristic level – 15% of students, demonstrating a creative, autonomous approach to research activities and readiness for independent inquiry in both academic and clinical contexts.

Reproductive level – 52% of students, capable of applying known methods and techniques to reproduce research outcomes under guidance but lacking independent methodological flexibility.

Adaptive level – 33% of students, showing developing but inconsistent skills in adapting existing research tools and methods to new professional situations.

These results reveal that the majority of students remain within the reproductive and adaptive levels, indicating that systematic pedagogical support is needed to elevate their competence to the heuristic level. This includes the integration of research components into professional training modules, the introduction of problem-based and inquiry-based learning strategies, and the development of reflective mechanisms that promote metacognitive awareness of the research process.

From a systemic perspective, research competence should be understood as both a process and a result of mastering research culture and generating new knowledge within the student's professional development. Through a structural-functional analysis of research competence, we have identified a set of criteria—motivation, scientific style of thinking, technological readiness, and creative research activity—each represented by specific indicators. These criteria provide an operational basis for diagnosing, evaluating, and enhancing the formation of research competence in the educational environment of a medical university.

The obtained results confirm that the formation of research competence is a dynamic and multifactorial process**,** influenced by pedagogical conditions, the quality of mentoring, and the presence of a creative research environment. Hence, improving research competence requires a comprehensive pedagogical model that combines motivational stimulation, methodological training, and personal reflection. Such an approach ensures the continuity of professional self-development and supports the formation of a competent, innovative, and humanistically oriented physician capable of contributing to both clinical practice and scientific advancement.

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