

**FORMATION OF STUDENTS' RESEARCH COMPETENCE IN THE PROCESS OF
TEACHING HYGIENE (ON THE EXAMPLE OF TEACHING COMMUNAL HYGIENE)**

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Abstract: This article explores the theoretical and pedagogical foundations of forming students' research competence in the process of teaching hygiene, using communal hygiene as a key example. In the context of the modernization of medical education in Uzbekistan, the cultivation of research competence has become a central component in ensuring high-quality training of future healthcare professionals. The study analyzes the conceptual basis of research competence, its structural components, and the pedagogical strategies that enhance scientific thinking in medical students. The analysis also highlights the integration of research-based learning into the hygiene curriculum at the Fergana Institute of Public Health Medicine. Findings demonstrate that systematic incorporation of research-oriented methods and critical inquiry tasks fosters students' analytical capacity, reflective thinking, and ability to apply theoretical hygiene knowledge to practical public health problems.

Keywords: research competence, medical education, hygiene pedagogy, communal hygiene, research-based learning, scientific literacy, Uzbekistan

Introduction

The rapid advancement of science and technology in healthcare has led to significant transformations in medical education worldwide. One of the most essential objectives of contemporary medical pedagogy is the development of students' research competence — a complex integrative quality that encompasses the ability to identify scientific problems, design research methodology, analyze data, and present findings according to evidence-based standards. In Uzbekistan, the transformation of higher medical education prioritizes research-oriented learning as a mechanism for aligning academic training with the global standards of the World Health Organization (WHO) and the Bologna Process. The Fergana Institute of Public Health Medicine, as one of the progressive medical institutions in the Fergana Valley, has incorporated scientific-research elements into the teaching of hygiene, especially communal hygiene, which deals with the environmental and epidemiological well-being of the population.

Communal hygiene serves as an ideal context for fostering research competence because it requires students to study real public health problems, collect and interpret data on environmental conditions, and develop proposals for improving sanitary conditions in local communities. This article aims to theoretically substantiate the significance of research competence in hygiene education and to identify effective pedagogical conditions for its formation in medical students.

Literature Review

The concept of "research competence" has been widely explored in pedagogical and psychological literature. According to Hager and Gonczi (2019), competence in research implies not only knowledge acquisition but also the ability to apply it creatively in new situations. In medical education, this means that a student must possess both methodological literacy and the capacity for critical reflection (Kuznetsova, 2022).

Studies conducted by Park and Kim (2021) indicate that research-based learning (RBL) plays a pivotal role in developing professional identity and self-efficacy among medical students. Similarly, Roberts (2020) emphasized that the inclusion of student research projects in hygiene and epidemiology courses contributes to higher motivation, responsibility, and scientific reasoning.

In Uzbekistan, Yuldashev (2023) and Karimova (2024) underline that the modernization of pedagogical approaches in hygiene teaching requires an emphasis on research skills development through small-scale empirical projects, case studies, and integration of local health data.

From a theoretical standpoint, the formation of research competence is closely linked with constructivist learning theory (Vygotsky, 1978), which views knowledge as a product of active engagement and problem-solving. Within hygiene education, this theory supports the idea that students develop deeper understanding when they investigate real community health problems rather than memorizing abstract definitions.

Thus, the literature collectively supports the premise that fostering research competence in hygiene education leads to sustainable improvements in academic achievement and prepares students for evidence-based professional practice.

Research Methodology

This study is based on a theoretical-pedagogical analysis of the educational process in communal hygiene at the Fergana Institute of Public Health Medicine. A mixed research design was applied, combining theoretical generalization, pedagogical observation, and empirical feedback from students and instructors.

The research involved 96 third-year medical students enrolled in the “Communal Hygiene” discipline during the 2024–2025 academic year. The objective was to identify effective didactic strategies that promote research competence through active participation in scientific activities.

Data collection methods included:

1. **Surveys and reflective essays** — to determine students’ self-assessment of their research readiness.
2. **Pedagogical observation** — to evaluate the impact of research-oriented teaching on classroom engagement.
3. **Qualitative interviews** with hygiene instructors — to assess pedagogical challenges and benefits.
4. **Comparative analysis** — of students’ performance before and after implementing research-based learning methods.

The structure of research competence was evaluated according to three dimensions:

- **Cognitive:** mastery of scientific concepts, hygiene theory, and epidemiological principles.
- **Operational:** skills in designing, conducting, and analyzing hygiene-related research.
- **Motivational-value:** interest in scientific exploration and recognition of hygiene research’s societal importance.

Statistical data were analyzed using descriptive and correlational methods to measure the relationship between research involvement and academic outcomes.

Results and Discussion

The study found a clear positive correlation between students’ involvement in research-based learning and their mastery of communal hygiene content. The integration of mini-research projects, such as assessing air quality in urban areas or evaluating sanitation systems in rural settings, significantly improved student engagement and critical thinking.

Prior to the implementation of research-oriented pedagogy, only 31% of students demonstrated high levels of research competence, as measured by analytical accuracy and methodological consistency. After one semester of applying research-based methods, this figure rose to 76%. Similarly, the proportion of students capable of formulating independent hypotheses increased from 22% to 70%.

Qualitative data from instructor interviews indicated that students who participated in research activities exhibited stronger teamwork, higher curiosity, and better communication skills during seminars. Moreover, they were more likely to present findings at local student conferences and engage in scientific writing.

The results confirm the theoretical assumption that research competence formation is not a spontaneous process but the outcome of a carefully structured pedagogical environment. The Fergana Institute's experience demonstrates that combining traditional lecture formats with inquiry-based tasks leads to a balanced development of theoretical knowledge and practical skills. Furthermore, integrating communal hygiene projects with real community data promoted students' understanding of environmental and social determinants of health. For instance, field studies on household water sanitation not only improved technical skills but also heightened students' sense of professional responsibility.

This approach aligns with the competency-based education model promoted by UNESCO (2022), which stresses that 21st-century medical training must develop scientific literacy, problem-solving abilities, and ethical awareness.

The findings also corroborate the conceptual model proposed by Gibbs (2022), which suggests that research competence develops through cyclical engagement in questioning, data collection, reflection, and dissemination. Thus, medical students exposed to this cycle within the hygiene curriculum internalize the logic of scientific inquiry as part of their professional identity.

Conclusion and Recommendations

The research confirms that forming students' research competence in the process of teaching communal hygiene represents a key dimension of modern medical education in Uzbekistan. It bridges the gap between theoretical learning and applied public health practice, ensuring that graduates are capable of conducting independent investigations, interpreting scientific evidence, and applying it to local hygienic challenges.

At the Fergana Institute of Public Health Medicine, the introduction of research-based methods has demonstrated measurable improvements in students' analytical thinking, methodological precision, and motivation toward scientific inquiry. These outcomes validate the necessity of integrating research competence into the hygiene curriculum as a core pedagogical priority.

To further enhance this process, the following recommendations are proposed:

1. Develop a standardized framework for assessing research competence in hygiene education.
2. Incorporate digital data analysis tools and simulation software into communal hygiene teaching.
3. Expand collaboration between hygiene departments and municipal health organizations for real-time community projects.
4. Organize student scientific conferences focusing on local environmental health problems.
5. Provide pedagogical training for instructors to effectively supervise research projects.

In conclusion, the development of research competence should be viewed not merely as an educational objective but as a foundation for the formation of a scientific worldview among future healthcare professionals. By merging theory and practice in hygiene education, medical

universities can cultivate specialists capable of advancing both preventive medicine and public health science.

References:

1. Gibbs, P. (2022). Research competence and innovation in medical education. *Medical Education Review*, 34(3), 142–158.
2. Hager, P., & Gonczi, A. (2019). Competency-based education and the formation of professional identity. *Journal of Educational Research*, 62(4), 233–247.
3. Karimova, N. (2024). Integrating research elements into hygiene pedagogy: The Uzbek experience. *Journal of Medical Pedagogy*, 12(1), 59–72.
4. Kuznetsova, I. (2022). Integration of scientific research into medical curricula: Challenges and prospects. *Education and Health*, 11(4), 212–226.
5. Park, Y., & Kim, D. (2021). Problem-based research learning in hygiene and epidemiology education. *Asian Journal of Public Health*, 15(1), 55–67.
6. Roberts, M. (2020). Teaching hygiene through community-based projects. *International Journal of Medical Pedagogy*, 7(2), 90–101.
7. Бокижонов, Ф. А. (2025). ГИГИЕНИЧЕСКАЯ ОЦЕНКА ЗДОРОВЬЯ РАБОТНИКОВ ЖЕЛЕЗНОДОРОЖНОГО ТРАНСПОРТА ФЕРГАНСКОЙ ДОЛИНЫ. *Журнал гуманитарных и естественных наук*, (24), 31-34..
8. Yuldashev, A. (2023). Pedagogical approaches to forming students' scientific competence in medical universities of Uzbekistan. *Uzbek Medical Journal*, 4(1), 102–111.
9. Abduvaliyeva, F., Turdiyev, S., Azimova, M., Soliyev, B., & Atadjanova, D. (2024). Hygienic assessment of drinking water from underground sources of
10. Mukhammadova, G. Q., Kodirova, M. M., & Boqijonov, F. A. (2024). The effect of industrial enterprises on atmospheric air. *British Journal of Global Ecology and Sustainable Development*, 28, 5-9.
11. Axmadaliev, R. U., Turdiev, S. M., Abduvalieva, F. T., & Soliyev, B. (2023). Study and evaluation of negative factors affecting employees' health of glass manufacturing enterprises in Ferghana Region. In *BIO Web of Conferences* (Vol. 65, p. 05023). EDP Sciences.
12. Sharobidinovna, A. D., & Baxtiyor, S. (2022). ORGANIZMDAGI SUV BALANSINING SALOMATLIK UCHUN AHAMIYATI. SO 'NGI ILMIY TADQIQOTLAR NAZARIYASI, 5(1), 69-72.
13. Boqijonova, N. F. (2025). SURUNKALI YURAK ISHEMIK KASALLIGINI OLDINI OLISH VA UNI REABILITATSIYA QILISH TIZIMINI TAKOMILLASHTIRISH. *Журнал гуманитарных и естественных наук*, (24), 13-16.