ISSN 2181-

IMPROVING THE METHODOLOGY OF DEVELOPING DIGITAL COMPETENCIES AMONG MEDICAL STUDENTS IN MEDICAL EDUCATION.

Nishonova Dilafruz Tojimatovna
Assistant Professor of normal and topographic anatomy
Central Asian Medical University

Abstract

The rapid digitalization of healthcare systems worldwide requires the transformation of medical education to develop students' digital competencies. This article aims to improve the methodology of forming digital competencies among medical students by integrating innovative digital tools, blended learning strategies, and competency-based approaches. Using a mixed-methods research design, this study examines current challenges in digital competency formation and proposes an improved methodological framework for effective integration into medical curricula. The findings suggest that systematic use of simulation technologies, e-learning platforms, and interprofessional digital collaboration can significantly enhance students' readiness for modern healthcare practice.

Keywords: Digital Competence, Medical Education, Pedagogical Innovation, ICT in Medicine, Educational Methodology

1. Introduction

In the 21st century, the healthcare sector has undergone a significant transformation driven by digital technologies such as electronic health records, artificial intelligence (AI), telemedicine, and data analytics. Consequently, medical education must evolve to ensure that future healthcare professionals acquire digital competencies that allow them to operate effectively in technology-rich clinical environments. Digital competence is now considered a core professional requirement

for doctors, nurses, and allied health workers (European Commission, 2022). However, many medical schools still rely on traditional teaching methods with limited integration of digital tools. This gap in methodology hinders the effective development of students' digital literacy, critical thinking, and problem-solving skills. Therefore, there is a pressing need to improve the methodological framework for developing digital competencies in medical education.

2. Literature Review

Digital competence in medical education has been defined as the combination of knowledge, skills, attitudes, and values that enable healthcare professionals to effectively use digital technologies in their practice (Redecker, 2017). Various scholars highlight that the acquisition of such competencies requires not only technical training but also pedagogical transformation (Bennett & Maton, 2010). Recent research (Tse & Tang, 2021; Kaczmarek et al., 2023) indicates that blended learning models and simulation-based education can significantly improve students' engagement and digital literacy. The World Health Organization (WHO, 2021) also emphasizes the importance of digital health literacy as an essential competency for future physicians. Nevertheless, there remains a methodological gap in aligning digital tools with competency-based medical curricula. The literature suggests that while universities are adopting e-learning platforms, there is still a lack of clear instructional design strategies that connect these technologies to measurable learning outcomes (Prensky, 2019).

3. Methods

This study applied a mixed-methods design combining quantitative and qualitative approaches. The research was conducted among 120 medical students from three universities. The quantitative phase included a survey assessing digital competence levels using a five-point Likert scale. The qualitative phase consisted of focus group interviews exploring students' experiences with digital learning tools. Additionally, an experimental learning intervention was implemented. It included:

1. Integration of digital case simulations in clinical subjects;

2. Use of online collaboration platforms (Microsoft Teams, Moodle);

3. Digital portfolio assessment for competency tracking.

Statistical analysis was performed using SPSS software to identify correlations between digital tool use and perceived competence.

4. Results and Discussion

The quantitative results indicated a statistically significant improvement in students' digital competencies after the intervention ($p < 0.01$). Students demonstrated enhanced proficiency in data management, digital communication, and ethical use of digital health resources. Qualitative feedback revealed that students valued real-time digital case simulations and online teamwork as effective learning experiences. However, they also highlighted the need for continuous instructor support and well-structured digital modules. The findings support the argument that digital competence is not merely a technical skill but a complex set of cognitive, ethical, and professional abilities. Improved methodology should thus focus on integrating digital skills development into the broader context of clinical reasoning, decision-making, and patient-centered care.

5. Conclusion

The study concludes that developing digital competencies among medical students requires a systematic, multi-level pedagogical approach. The improved methodology must combine competency-based education principles with digital pedagogy, simulation learning, and collaborative digital environments. Medical universities should:

- Include digital literacy and ethics as core components of the curriculum;
- Provide ongoing faculty training in digital pedagogy;
- Implement continuous digital competence assessment tools;
- Foster partnerships with healthcare institutions for real-world digital practice.

Such improvements will prepare medical graduates for the digital transformation of healthcare, ensuring safe, effective, and patient-centered digital care delivery.

References

1. Bennett, S., & Maton, K. (2010). Beyond the “digital natives” debate: Towards a more nuanced understanding of students’ digital engagement. Journal of Computer Assisted Learning, 26(5), 321–331.
2. European Commission. (2022). The Digital Competence Framework for Citizens (DigComp 2.2). Luxembourg: Publications Office of the European Union.
3. Kaczmarek, M., Nowak, T., & Domański, M. (2023). Digital health education in Europe: Current trends and challenges. Medical Education Online, 28(1), 218–233.
4. Prensky, M. (2019). Teaching Digital Natives: Partnering for Real Learning. Corwin Press.
5. Redecker, C. (2017). European Framework for the Digital Competence of Educators (DigCompEdu). Publications Office of the EU.
6. Tse, C., & Tang, W. (2021). Simulation-based learning in medical education: Enhancing digital competence and clinical performance. BMC Medical Education, 21(324), 1–9.
7. World Health Organization. (2021). Global Strategy on Digital Health 2020–2025. WHO Press.