

RESEARCH ARTICLE

Med-Edu Design-360: A Pedagogical Model for Developing Future Physicians' Competence in Creating Electronic Methodological Support

M.E. Tadjiddinov

Independent researcher, Andijan State Medical Institute, Uzbekistan, Andijan

VOLUME: Vol.06 Issue03 2026

PAGE: 260-264

Copyright © 2026 European International Journal of Pedagogics, this is an open-access article distributed under the terms of the Creative Commons Attribution-Noncommercial-Share Alike 4.0 International License. Licensed under Creative Commons License a Creative Commons Attribution 4.0 International License.

Abstract

The digitalization of medical education changes the requirements for future physicians by expanding the role of digital educational resources, electronic methodological materials, and technology-supported learning. This study presents the MED-EDU DESIGN-360 pedagogical model developed for forming future physicians' competence in creating electronic methodological support. The model integrates competency-based learning, activity-oriented learning, digital pedagogy, and reflective practice into a complete cycle of diagnosis, methodological design, digital content creation, implementation and testing, and reflection-based improvement. The dissertation-based study involved 416 students from medical higher-education institutions. The model was operationalized through practical production of electronic textbooks, interactive modules, video lessons, electronic test banks, and learning-management-system content. Competence was considered through cognitive, practical, digital, reflective, and motivational components, while the dissertation also identifies motivational, cognitive, reflexive, and knowledge-related criteria and corresponding indicators. Reported experimental results showed increases of 29–34% in students' competence to design and create electronic methodological materials, 27–31% in independent use of digital learning platforms, 23–28% in development of electronic assessment tools, and 25–30% in the use of virtual laboratory and simulation elements. Corresponding changes in control groups were reported within approximately 9–13%. The model provides a structured pedagogical pathway for converting theoretical knowledge of medical information technologies into demonstrable digital educational products.

KEY WORDS

Medical education; future physicians; digital competence; electronic methodological support; MED-EDU DESIGN-360; digital pedagogy; competency-based education; reflective learning; medical digitalization.

INTRODUCTION

Medical digitalization has expanded the educational role of information technologies. Future physicians increasingly encounter electronic information systems, digital educational resources, computerized data processing, learning-management systems, multimedia content, electronic

assessment, and simulation technologies. Accordingly, digital competence in medical higher education should include not only the ability to consume digital information but also the ability to design and produce structured educational resources.

The dissertation on which this article is based addresses the development of future physicians’ competence in creating electronic methodological support. A central premise of the research is that students should be involved in the creation of digital educational products rather than being limited to passive use of ready-made resources. Such activity links knowledge of information technologies with pedagogical design and professional medical contexts.

The purpose of this article is to describe the MED-EDU DESIGN-360 model as a pedagogical mechanism for developing this competence and to present the dissertation-derived experimental evidence associated with its implementation.

CONCEPTUAL BASIS OF THE MODEL

The MED-EDU DESIGN-360 model is designed around four complementary pedagogical principles identified in the dissertation: competency-based learning, activity-oriented learning, digital pedagogy, and reflective learning. Competency-based learning emphasizes observable learning outcomes; activity-oriented learning organizes learning through the principle of “learning through creation”; digital pedagogy connects information technologies with didactic purposes; and reflective learning requires students to analyze and improve their own work.

The term MED-EDU DESIGN-360 combines MED, referring to the medical field; EDU, referring to education and pedagogical organization; DESIGN, referring to the design of electronic methodological support; and 360, referring to a complete cycle from diagnosis through design, creation, implementation, assessment, and reflection.

The target competence is consequently multidimensional. The dissertation describes cognitive, practical, digital, reflective, and motivational components. It also provides criteria and indicators addressing students’ motivation to create electronic methodological support, theoretical knowledge, self-assessment and reflection, and knowledge-related and creative activity.

METHODS

1. Participants and Research Context

The dissertation research involved 416 students from medical

higher-education institutions, including Andijan State Medical Institute, Bukhara State Medical Institute, and Samarkand State Medical University. Experimental and control groups were used to examine changes associated with the proposed educational methodology.

The present article reports only findings and methodological elements documented in the dissertation. No additional sample, institution, intervention, or numerical effect is introduced.

2. Competence Structure and Assessment

The competence was assessed through a set of indicators reflecting students’ readiness and ability to create electronic methodological support. The dissertation includes motivational indicators such as awareness of the need to develop this competence and readiness to demonstrate it; cognitive indicators related to acquisition and application of theoretical knowledge; reflexive indicators related to self-assessment and analysis; and knowledge-related indicators involving information acquisition, justification, and recognition of interdisciplinary relationships.

For methodological interpretation, these criteria can be organized into five mutually connected components:

- Motivational component — awareness of the value of electronic methodological support and willingness to develop the relevant competence.
- Cognitive component — theoretical understanding of electronic methodological support and its role in professional and educational activity.
- Practical component — ability to design and produce electronic educational products.
- Digital component — ability to use information technologies and digital learning environments in purposeful educational activity.
- Reflective component — ability to evaluate one’s own digital product, identify limitations, and improve it.

3. Five-Stage MED-EDU DESIGN-360 Cycle

The dissertation defines the author’s practical methodology as a five-stage integrative cycle. Each stage has a specific educational action and a concrete output.

Stage	Learning activity	Student output	Pedagogical function
-------	-------------------	----------------	----------------------

1. DIAGNO–START	Entrance test, digital-literacy questionnaire and mini-tasks to determine the initial level.	Diagnostic profile and individual learning trajectory.	Identify starting needs and differentiate learning.
2. E-LEARN DESIGN	Design objectives, content, interactivity, multimedia and assessment structure.	Methodological design project.	Transform pedagogical objectives into a digital resource architecture.
3. DIGITAL CONTENT CREATION	Create video lessons, interactive test banks, LMS content, electronic assignments and assessment mechanisms.	Working electronic methodological product.	Convert theory into an observable digital product.
4. IMPLEMENT–TEST	Pilot the product in small groups; collect feedback and test results.	Tested prototype with evidence of use.	Evaluate usability and educational effectiveness.
5. REFLECT–IMPROVE	Reflective report, mentor feedback and digital portfolio; revise the product.	Improved electronic methodological support.	Consolidate competence through self-analysis and iteration.

RESULTS

The dissertation reports positive changes in the experimental groups after implementation of the methodology. The

reported results concern several practical manifestations of electronic methodological competence rather than a single undifferentiated digital-literacy measure.

Assessed outcome	Experimental-group change reported in the dissertation	Control-group change
Designing and creating electronic methodological materials	29–34%	9–13%
Independent and conscious use of distance-learning platforms	27–31%	9–13%
Development of electronic tests and assessment tools	23–28%	9–13%
Use of virtual laboratory and simulation elements	25–30%	9–13%

The dissertation also reports a broader model-based result: students participating in the experimental educational process demonstrated a 30–35% increase in competence in creating electronic methodological support, a 28–33% increase in readiness to apply digital educational resources in professional activity, and a 24–29% increase in methodological design and assessment skills. These figures belong to the dissertation's separate description of the educational model and are therefore not merged mathematically with the four indicators

in the preceding table.

DISCUSSION

The principal methodological significance of MED-EDU DESIGN-360 is the transformation of students from users of electronic educational materials into designers and creators of such materials. This shift changes the learning task from "knowing how a technology works" to "using technology to create a pedagogically meaningful product."

The five-stage cycle also establishes a connection between initial diagnosis and final improvement. Diagnostic information is used to define an individual learning trajectory; methodological design provides a pedagogical structure; digital content creation produces an observable artifact; implementation and testing provide external evidence; and reflection creates the basis for revision. Thus, competence is developed through repeated cycles of planning, production, evaluation, and improvement.

The model is particularly relevant to medical education because electronic methodological products can be connected with medical cases, clinical information, educational simulations, computerized analysis of medical data, and other professional contexts. The dissertation also documents the development and educational implementation of resources such as materials for computerized analysis of medical information and a teaching guide on processing textual information in workplace automation using Microsoft Word.

EDUCATIONAL ARCHITECTURE AND EXPECTED OUTPUTS

Within the MED-EDU DESIGN-360 architecture, each stage is expected to produce an identifiable artifact. The dissertation describes a diagnostic profile, content-generation map, case-design passport, working interactive prototype, evidence from immersive or simulation-based testing, and a reflective improvement report as examples of stage-specific outputs.

- Diagnostic profile: documents the learner's starting digital and methodological level.
- Content-generation map: links learning objectives, content, multimedia, activities, and assessment.
- Case-design passport: specifies the structure and pedagogical purpose of an applied learning scenario.
- Interactive prototype: represents a functioning electronic educational product.
- Testing evidence: records user feedback, task performance, and assessment results.
- Reflective improvement report: identifies limitations and documents revisions to the product.

PRACTICAL IMPLICATIONS FOR MEDICAL HIGHER EDUCATION

- Electronic methodological support can be taught as a

production-oriented competency rather than as a purely theoretical topic.

- Students can be required to create complete digital products with explicit learning objectives, content structure, interactive elements and assessment mechanisms.
- Assessment should evaluate both the quality of the digital product and the student's ability to explain its pedagogical purpose.
- Digital portfolios can provide longitudinal evidence of students' progress across multiple electronic products.
- Mentor and peer feedback can be integrated before final submission to support iterative improvement.
- The model can be adapted to different medical disciplines by replacing generic examples with discipline-specific cases, datasets, simulations and educational scenarios.

LIMITATIONS

The evidence presented is derived from the dissertation's educational experiment and should therefore be interpreted within its institutional and methodological conditions. The reported percentage changes should not be treated as universal effect sizes across medical education systems. The study also provides a methodological framework that would benefit from additional longitudinal and multicenter validation, including assessment of the durability of competence and its transfer to subsequent clinical or teaching activities.

CONCLUSION

MED-EDU DESIGN-360 provides a structured pedagogical model for developing future physicians' competence in creating electronic methodological support. Its distinctive feature is the integration of diagnosis, methodological design, digital content production, implementation and testing, and reflective improvement into a complete learning cycle. By combining competency-based, activity-oriented, digital-pedagogical, and reflective principles, the model connects theoretical knowledge of information technologies with the production of usable educational resources. The dissertation-based results document positive changes in electronic methodological design, independent use of digital learning platforms, electronic assessment, and simulation-related skills in the experimental groups. The model therefore offers a coherent basis for organizing production-oriented digital

learning in medical higher education, while further studies are needed to validate its transferability across institutions and disciplines.

REFERENCES

1. М.Таджидинов. Dissertation on the development of future physicians' competence in creating electronic methodological support under conditions of medical digitalization. Tashkent; 2026.
2. Nikadambaeva H.B. O'zbekiston tabiiy geografiyasi fanini o'qitishda elektron o'quv-metodik ta'minotdan foydalanish metodikasi. Zamonaviy ta'lim. 2014;4.
3. Olimov Q. Elektron darslikni yaratishning uslubiy asoslari. Kasb-hunar ta'limi. Tashkent. 2004;2:11–13.
4. Tursunov S. Ta'limda elektron axborot resurslarini yaratish va ularni joriy qilishning metodik asoslari. PhD dissertation. Tashkent; 2011. 154 p.
5. Begimqulov U.Sh. Oliy pedagogik ta'lim tizimiga zamonaviy AKTni joriy etishning ilmiy-pedagogik asoslari. DSc dissertation. Tashkent: TDPU; 2007. 250 p.
6. Jo'raev V.T. Elektron ta'lim muhitida pedagogik dasturiy vositalardan foydalanish metodikasini takomillashtirish. PhD dissertation. Tashkent; 2021:71–76.
7. Shoymardonov T.T. Elektron pedagogika va pedagogning shaxsiy, kasbiy axborot maydonini loyihalash. O'quv-uslubiy majmua. Tashkent; 2017.
8. Zakirova F.I. Ta'lim jarayonida mobil ilovalardan foydalanishning pedagogik asoslari. Academic Research in Educational Sciences. 2022.
9. Ulug'bekova G.J. Raqamli texnologiyalar muhitida tibbiy ta'lim tizimining barqaror rivojlanish tendensiyalari. International Scientific and Practical Conference. May 17–18, 2024.
10. Pozilova Sh.X. Pedagogik dasturiy vositalar. 2019. 172 p.