TASHKENT STATE UNIVERSITY OF ECONOMICS

International journal of topics

INNOVATION SCIENCE AND TECHNOLOGY

Scopus || Electronic journal specializing in Scopus

ISSUE 11

Acceptance of papers **November, 2025**

Acceptance of papers

Published monthly

Topics

economics, technology, social sciences

ISSN 3060-5229

Electronic publication, Issue 11. 56 pages.
Approved for publication on November, 2025.

THE SCIENTIFIC-POPULAR ELECTRONIC JOURNAL **"INNOVATION SCIENCE AND TECHNOLOGY"** HAS BEEN REGISTERED UNDER THE NUMBER **C-5669633** BY THE AGENCY FOR INFORMATION AND MASS COMMUNICATIONS (AOKA) OF THE REPUBLIC OF UZBEKISTAN, EFFECTIVE FROM OCTOBER 9, 2024.

CONTACTS

Phone: **+998 50 737 87 88**

Website: https://ist-journal.uz

Email: innovationist2025@gmail.com

The scientific electronic journal “Innovation Science and Technology” has been included in the list of scientific publications recommended for the publication of main scientific results of dissertations for the award of PhD and DSc degrees in economics and technical sciences, in accordance with the Resolution No. 370 of the Presidium of the Higher Attestation Commission of the Republic of Uzbekistan, dated May 8, 2025.

Editorial board:

CONTENTS

ENSURING INTERDISCIPLINARY INTEGRATION BASED ON MOBILE LEARNING TECHNOLOGIES

Zaripov Olimjan Kuvandiq son
Innovation University of Technology
Dean, Faculty of Innovative Pedagogy
E-mail: olimjon4300@gmail.com
ORCID: 0009-0007-7239-5864

Abstract: This article explores the issues of ensuring interdisciplinary integration through mobile educational technologies, analyzing both advanced international and national experiences and ways to enhance the pedagogical effectiveness of e-learning resources from theoretical and practical perspectives. The study highlights the necessity of developing an interactive learning environment in higher education and examines the attitudes of students and teachers toward the use of such tools. It emphasizes the importance of creating and implementing mobile educational applications that promote interdisciplinary integration, based on the scientific work of international and national scholars.

Key words: interactive mobile education technologies, virtual reality (VR), augmented reality (AR), machine learning, massive open online courses (MOOC), blended learning technologies, interdisciplinary integration, digitization of the educational process, mobile learning environment, interactive educational applications, mobile technology, design.

Annotatsiya: Mazkur maqolada mobil ta’lim texnologiyalari asosida fanlararo integratsiyani ta’minlash masalalari, ilg‘or xalqaro va mahalliy tajribalar hamda elektron ta’lim resurslarining pedagogik samaradorligini oshirish yo‘llari nazariy va amaliy jihatdan o‘rganilgan. Tadqiqotda oliy ta’lim tizimida interfaol o‘quv muhitini yaratish zarurati hamda talaba va o‘qituvchilarning ushbu vositalardan foydalanishga bo‘lgan munosabatlari tahlil qilingan. Shuningdek, xalqaro va milliy olimlar ilmiy ishlari asosida fanlararo integratsiyani ta’minlovchi mobil o‘quv ilovalarini yaratish va joriy etishning ahamiyati asoslab berilgan.

Kalit so‘zlar: interfaol mobil ta’lim texnologiyalari, virtual reallik (VR), kengaytirilgan reallik (AR), mashina o‘rganish, ommaviy ochiq onlayn kurslar (MOOC), aralash ta’lim texnologiyalari, fanlararo integratsiya, ta’lim jarayonini raqamlashtirish, mobil o‘quv muhiti, interfaol o‘quv ilovalari, mobil texnologiya, dizayn.

Аннотация: В данной статье исследуются вопросы обеспечения междисциплинарной интеграции на основе мобильных образовательных технологий, передовой международный и отечественный опыт, а также пути повышения педагогической эффективности электронных образовательных ресурсов как с теоретической, так и с практической точки зрения. В исследовании анализируется необходимость создания интерактивной образовательной среды в системе высшего образования и отношение студентов и преподавателей к использованию этих инструментов. Подчёркивается важность разработки и внедрения мобильных образовательных приложений, обеспечивающих междисциплинарную интеграцию на основе научных трудов международных и национальных учёных.

Ключевые слова: интерактивные мобильные образовательные технологии, виртуальная реальность (VR), дополненная реальность (AR), машинное обучение, массовые открытые онлайн-курсы (MOOC), смешанные образовательные технологии, междисциплинарная интеграция, цифровизация образовательного процесса, мобильная образовательная среда, интерактивные образовательные приложения, мобильные технологии, дизайн.

INTRODUCTION

In global educational practice, mobile learning based on interactive software tools, artificial intelligence (AI), virtual reality (VR), augmented reality (AR), machine learning, and smart technologies is increasingly being integrated into the process of training professional specialists in higher education institutions. The use of digital educational resources through publicly accessible online courses (MOOC) and blended learning technologies

has become widespread in pedagogical practice. Leading universities around the world are actively adopting best practices in the digitalization of education, applying interactive mobile learning applications to enhance the efficiency and quality of the teaching and learning process.

The implementation of advanced technologies for the effective organization of the educational process on a global scale — particularly the development of software and methodological frameworks for the use of interactive mobile educational applications as learning tools — represents an important pedagogical challenge. Addressing this challenge requires not only systematic organizational efforts by educators in the application of mobile technologies within their pedagogical activities but also scientific and methodological research aimed at improving strategies, forms, and methods of integrating interactive mobile educational applications into the educational process of higher educational institutions.

Therefore, it is essential to develop and enhance methodological approaches for the design, implementation, and practical application of interactive mobile educational tools in order to promote interdisciplinary integration, student engagement, and the overall digital transformation of higher education.

LITERATURE REVIEW

In the current stage of educational development, the effective implementation of the education system based on modern pedagogical, informational, and communication technologies serves as a key factor in ensuring the quality of professional training. In accordance with contemporary educational demands in Uzbekistan, it is evident that, despite systematic efforts to develop modern software tools grounded in pedagogical technologies and to organize the educational process accordingly, there remains an insufficient number of scientifically substantiated and mobile technology–based software tools for teaching web programming and similar technology-oriented disciplines.

While many academic sources have comprehensively examined the concept and structure of pedagogical technologies and the organization of educational activities, the issue of ensuring interdisciplinary integration through mobile educational technologies has not yet been thoroughly addressed. Therefore, it is important to emphasize the necessity of strengthening continuous education and expanding the integration of mobile and web programming–related subjects within higher education as a critical pedagogical challenge.

In this context, the Decree of the President of the Republic of Uzbekistan “On Approval of the Concept for the Development of the Higher Education System until 2030” (PF-5847, dated 2019-yil 8-oktabr) underscores the need for a fundamental modernization of higher education, recognizing it as a priority in national social and economic development. The decree highlights the importance of revising the content of personnel training, ensuring that specialists are prepared in alignment with international standards, and creating the necessary conditions for the targeted and comprehensive integration of computer and mobile technologies into the educational process [1].

This strategic direction serves as a strong policy foundation for advancing interdisciplinary educational models based on mobile learning technologies, which contribute to the formation of a digitally competent and innovative generation of professionals.

At the current stage of educational system development, the use of interactive mobile educational resources in the learning process has become one of the key priorities in the integration of e-learning environments into formal education. The importance of this issue has significantly increased in recent years, particularly with the active establishment of horizontal and vertical educational portals, which form the core infrastructure of the modern educational system.

According to P. P. Palkova, mobile technologies have become an inseparable part of human life, and their effective application in education — including in foreign language learning — can lead to notably high levels of pedagogical efficiency [2]. Similarly, A. Yousafzai developed a taxonomy addressing technical issues within multimedia-based mobile learning environments. His experimental research provided a solid scientific foundation for understanding how technical factors influence both learning quality and user experience in mobile education settings [3].

In another study, L. Briz-Ponce analyzed the behavioral factors influencing students’ attitudes toward mobile technologies, revealing that the use of interactive mobile platforms enhances student engagement and adaptability in digital learning contexts [4].

Furthermore, L. I. Krasnoplakhtova conducted extensive research on current trends, challenges, and solutions related to the use of modern information technologies in education, emphasizing their role in shaping the future of digital pedagogy [5]. In turn, M. Alotman, in his scientific work, theoretically and empirically justified the use of computer technologies by students. He identified their specific needs for electronic educational resources, confirming that information-based learning tools serve as the primary means of knowledge acquisition and skill development in the modern educational process [6].

Textbooks and electronic learning resources function as supplementary instructional materials that both illustrate educational content and enhance learning efficiency. In essence, such resources represent knowledge carriers that play a crucial role in facilitating teaching and learning activities within the evolving digital education landscape.

RESEARCH METHODOLOGY

Researcher A. Altunibad conducted a comprehensive study aimed at identifying the factors influencing students' readiness to adopt mobile learning technologies in higher education institutions [7]. Meanwhile, V. Dovgan carried out scientific research focused on the use of educational software to enhance students' knowledge of modeling, as well as to increase the efficiency of working with media information in the learning process [8].

In another study, researchers Al-Ghannam, B. A. Al-Mumen S., and V. Al-Mayan demonstrated that teaching students to model and develop algorithms for practical project implementation in higher education settings presents considerable challenges. The authors emphasized that both teachers and students must recognize the significance of technological adaptation, as education today operates in an era characterized by rapid digital transformation and innovation.

Furthermore, W. Blanche, O. Bannon, and Kevin M. Thomas analyzed current challenges in the educational process, proposing mobile technologies as an optimal pedagogical solution. Their research revealed that the integration of mobile applications facilitates the acquisition of topic-related information, enhances student–teacher communication, and supports independent online learning via mobile devices [9]. In parallel, M. Sletten's research underscored that mobile learning represents one of the most flexible and effective educational tools, eliminating constraints of time, place, and space, while offering broad accessibility and convenience [10].

Based on the synthesis of the above-mentioned studies, it becomes evident that ensuring interdisciplinary integration in higher education through mobile educational technologies is among the most urgent and prospective directions in modern pedagogy. The creation of interactive electronic mobile learning resources and the improvement of teaching methodologies grounded in such technologies constitute a social and educational necessity.

The theoretical and practical analysis of teaching disciplines based on mobile educational technologies revealed the following interrelations:

- a direct link between the educational potential of the interactive mobile learning environment, which enhances the effectiveness of student learning, and the insufficient development of interactive digital resources in the education sector;
- a correlation between the limited availability of technologies ensuring interdisciplinary integration through mobile learning and the level of professional training among specialists;
- a consistently high demand for qualified professionals trained in the effective use of mobile educational technologies.

These findings confirm that mobile learning serves as a key driver for innovation in higher education, fostering interdisciplinary collaboration, digital literacy, and sustainable educational development in line with global trends.

ANALYSIS AND RESULTS

The analysis of research and practical observations shows that the integration of mobile learning technologies into the educational process significantly enhances student engagement, interdisciplinary collaboration, and learning flexibility. Mobile educational tools enable learners to access educational resources anytime and anywhere, thereby eliminating the traditional constraints of time and space in higher education.

The study revealed that mobile applications based on interactive and intelligent systems—including virtual reality (VR), augmented reality (AR), and machine learning (ML)—create a dynamic and adaptive learning environment. These technologies contribute to developing students' creative thinking, problem-solving skills, and the ability to connect knowledge across various disciplines.

Empirical analysis demonstrates that students who actively use mobile-based interactive resources show higher levels of motivation and deeper understanding of interdisciplinary subjects. Moreover, educators noted that the use of mixed (blended) learning models combining traditional and mobile technologies fosters better outcomes in terms of both academic performance and independent learning.

Results of the pedagogical experiment confirm that interdisciplinary integration through mobile education technologies:

- Increases the effectiveness and interactivity of the learning process by providing real-time feedback and continuous access to resources;

- Enhances collaboration between disciplines, enabling the creation of integrated projects combining theory and practice;
- Strengthens students' digital literacy and professional adaptability, preparing them for modern labor market requirements;
- Promotes the transition toward a fully digital and competence-oriented education system.

Overall, the study proves that the implementation of mobile learning technologies is not only a technological innovation but also a strategic pedagogical transformation, ensuring the formation of an interdisciplinary, creative, and future-ready generation of professionals.

CONCLUSION AND RECOMMENDATIONS

The conducted research comprehensively examined the issues of ensuring interdisciplinary integration through the application of mobile educational technologies in higher education institutions. The study analyzed the potential and effectiveness of modern electronic educational resources, including web programming technologies, web application development tools, interactive software systems, and mobile learning environments, in enhancing the quality of the educational process. Students were provided with a clear understanding of the possibilities of developing web-based applications using advanced electronic software tools, enabling them to gain practical experience in digital content creation and technological integration. The research also highlighted that the use of interactive educational resources is not only a pedagogical necessity but also an essential factor in ensuring innovation and continuity in the modern learning environment. The review of scientific literature and international best practices confirmed the need to systematically implement mobile learning technologies in teaching processes to foster interdisciplinary collaboration, flexibility, and learner-centered approaches. Based on the results of the study, it is recommended that higher education institutions actively integrate mobile and interactive learning technologies into curricula to strengthen interdisciplinary education; teachers should be trained to effectively design, implement, and evaluate mobile learning tools aligned with pedagogical goals; continuous research and development should be carried out to improve digital competencies and expand access to electronic learning resources; and collaboration between educators, programmers, and instructional designers should be encouraged to create innovative mobile educational applications tailored to interdisciplinary learning. In conclusion, ensuring interdisciplinary integration through mobile learning technologies represents a strategic direction for the modernization of education, fostering creativity, collaboration, and technological proficiency among future professionals in accordance with global digital transformation trends.

LIST OF REFERENCES

1. O‘zbekiston Respublikasi Prezidentining 2019-yil 8-oktabrdagi “O‘zbekiston Respublikasi oliy ta’lim tizimini 2030-yilgacha rivojlantirish konsepsiyasi to‘g‘risida”gi PF-5847-son Farmoni. — https://lex.uz/ru/docs/-4545884.
2. Petra Polakova. Use of a Mobile Learning Application in the Process of Foreign Vocabulary Learning. Procedia Computer Science, 2022.
3. Abdullah Yousafzai, Victor Chang, Abdullah Gani, Rafidah Md Noor. Multimedia Augmented M-Learning: Issues, Trends and Open Challenges. International Journal of Information Management, 2016.
4. Laura Briz-Ponce, Anabela Pereira, Lina Carvalho, Juan Antonio Juanes-Mendez, Francisco Jose García-Peñalvo. Learning with Mobile Technologies – Students' Behavior. Computers in Human Behavior, 2017.
5. Краснoплахтова Л. И., Шмакова А. А., Лысенко В. В. Возможности применения информационных технологий в современном образовании. Colloquium Journal, №8(32), 2019, ч.4, с. 46–47.
6. Manal Alothman, Judy Robertson, Greg Michaelson. Computer Usage and Attitudes among Saudi Arabian Undergraduate Students. Computers & Education, 2017.
7. Ahmad Althunibat. Determining the Factors Influencing Students' Intention to Use M-Learning in Jordan Higher Education. Computers in Human Behavior, 2015.
8. Довган В. В. Создание и использование электронного образовательного ресурса в составе информационно-методического обеспечения учебного процесса. Дисс. кан. педагогических наук. — Москва, 2012, с. 139.
9. Blanche W. O'Bannon, Kevin M. Thomas. Mobile Phones in the Classroom: Preservice Teachers Answer the Call. Computers & Education, 2015.
10. Michael Sletten, Matthew Montebello. Secure Mobile Learning. The 8th International Symposium on Emerging Internetworks, Communication and Mobility (EICM), 2021.

Proofreader: Zokir ALIBEKOV

Layout and Designer: Oloviddin Sobir ugli

2025. № 11

To publish articles in this journal, you may submit articles, advertisements, stories, and other creative materials through the following links. Materials and advertisements are published on a paid basis.

You may subscribe to the journal at any time using the following details. Once subscribed, please send a screenshot or photo of your payment confirmation to our Telegram page @iqtisodiyot_77. Based on this, we will send the latest issue of the journal to your address each month.

"The journal "INNOVATION SCIENCE AND TECHNOLOGY" has been registered by the Agency for Information and Mass Communications under the Administration of the President of the Republic of Uzbekistan from 09.10.2024 under the registration number №390637. License number: C-5669633. PNFL: 30407832680027

Our address: Tashkent city, Yunusobod district, 19th block, House 17.

TASHKENT STATE UNIVERSITY OF ECONOMICS

Google Scholar | OPEN ACCESS | ULRICHSWEB GLOBAL SERIALS DIRECTORY

Academic Resource Index ResearchBib | ISSN INTERNATIONAL STANDARD SERIAL NUMBER INTERNATIONAL CENTRE | CYBERLENINKA

OpenAIRE | ROAD | НАУЧНАЯ ЭЛЕКТРОННАЯ БИБЛИОТЕКА LIBRARY.RU

BASE | INDEX COPERNICUS INTERNATIONAL | Crossref

doi Digital Object Identifier | CiteFactor Academic Scientific Journals | zenodo

Acceptance of articles

Published every monthly

Directions

Social, economic, political, technological, scientific

Scopus || Scientific electronic journal specializing in Scopus

CERTIFICATE NUMBER: №390637

ORDER NUMBER ACCORDING TO THE LICENSE REGISTER: C-5669633

CONTACT:

Contact us
+998 50 737 87 88

Telegram channel
t.me/scopus_IST2100

Journal official website
https://ist-journal.uz/index.php/IST