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USE OF MODERN TEACHING TECHNOLOGIES AND INNOVATIVE METHODS

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Keranova Raygul Kuandikovna
2nd year of Master's degree
Nukus state pedagogical institute named after Ajiniyaz
(Republic of Karakalpakstan, Nukus)
raygulkeranova@gmail.com
+998904211937

Abstract

The present study examines the process of systemic modernisation of the educational environment under the influence of the digital transformation of society. The author conducts a comprehensive analysis of the current pedagogical vectors for 2025, including personalised (adaptive) learning, the implementation of immersive technologies (VR/AR) and artificial intelligence systems. This study pays particular attention to the delineation of the concepts of personalisation and individualisation. In addition, it identifies institutional and economic barriers that hinder the widespread introduction of high-tech solutions into domestic practice.

The article provides a systematic overview of contemporary interactive teaching methods, including case studies, project-based learning, coaching and business games. The article goes on to provide substantiated evidence for the role of these methods in improving educational outcomes. It is evident that, in accordance with predictive analysis, the fundamental challenges that will need to be addressed over the course of the upcoming decade pertain to the necessity of cultivating transversal competencies and ensuring the optimal psychophysical well-being of students. It is concluded that the achievement of strategic educational goals is only possible if innovations are integrated at all hierarchical levels, from programme content to administrative management systems.

Keywords

digital transformation of education, personalised learning, immersive technologies, artificial intelligence in pedagogy, distance learning technologies, interactive teaching methods, transversal competences, innovative educational environment.

Introduction: In contemporary socio-cultural contexts, educational institutions are recognised as pivotal agents in determining and shaping the development of

the individual. The present age is characterised by the intensive integration of innovative technologies and the accelerated transition to a digital society. These phenomena necessitate the verification and implementation of progressive pedagogical tools. The objective of these methods is to optimise the teaching process and to determine the creation of a highly effective educational environment.

The contemporary pedagogical community is oriented towards the continuous monitoring of current educational technologies and their systematic implementation in practical activities. In 2025, the personalisation of education is recognised as the prevailing vector of development in the field of pedagogical science. It is evident that there is a prevailing tendency for the incorporation of adaptive programmes into the curricula of professional educational organisations.

This strategy is predicated on the principles of individualisation, with consideration given to the cognitive needs, psychophysiological characteristics and professional interests of students. The implementation of this approach has been demonstrated to contribute to a significant increase in the effectiveness of the educational process and to ensure that students achieve qualitatively new academic results.

Methods: In the prevailing circumstances, the fundamental vector of transformation of the educational paradigm is the systematic integration of high-tech tools into the educational process. In light of the pervasive digital socialisation that characterises the contemporary generation, the integration of information and communication technologies (ICT) has become imperative for the effective functioning of higher and secondary education.

The utilisation of verified electronic educational resources (EER), interactive teaching complexes and automated knowledge control systems (online testing) has been demonstrated to engender an increase in student engagement and to provide equal access to quality content. In this regard, the theoretical and methodological analysis of innovative pedagogical technologies aimed at the harmonious development of the individual in a digital environment is a priority task for the scientific and pedagogical community.

The objective of this study is to conduct a comprehensive analysis of contemporary technologies and methodologies employed in the evaluation of the efficacy of learning processes and socio-cultural education within contemporary educational organisations.

The theoretical foundation of the study is predicated on a critical analysis of the works of foreign specialists and the relevant regulatory legal acts governing educational activities.

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Despite the continued importance of the classical lecture-seminar system, a structural transformation of the didactic process is observable in global pedagogical practice. In particular, the integration of brief virtual reality (VR) immersion sessions enables the expeditious establishment of cognitive priorities, the intensification of material assimilation, and the provision of a clear visualisation of abstract concepts. In this regard, the development of scientifically based protocols for human-technical system interaction in a virtual environment, involving multisensory perception, is classified as a priority task of modern pedagogy.

The present year, 2025, is designated as a period of substantial qualitative transformation in the domain of education. The accelerated implementation of innovative technologies is determined by the need to improve the effectiveness of knowledge internalisation and the transition to interactive learning models. The following section presents a systematic analysis of the key vectors of development and technological solutions integrated into the modern educational process.

1. Adaptive (personalised) learning is a didactic approach that is centred on the learner and their proactive educational activities. A fundamental aspect of this approach entails the consideration of the cognitive interests and prior experiential background of the subject, thereby enabling the correlation of temporal characteristics and knowledge internalisation methodologies with their distinct individual preferences.

It is imperative to establish a clear distinction between personalised and individualised learning:

The concept of personalisation can be defined as the process of delegating authority to the learner to choose the trajectory and conditions of the educational process. This approach has been shown to stimulate the learner's subjective position (Smith, 2019).

The individualisation of education is characterised by the predominant role of the teacher, who establishes the parameters of learning in accordance with the ascertained characteristics of the student's personality.

The integration of specialised software and predictive algorithms facilitates the implementation of a sophisticated monitoring system that enables the analysis of each learner's academic potential and deficits. This analysis is then utilised to formulate a variable content and a relevant set of tasks. A critical aspect of this methodology is the verification of the decision-maker, i.e. it is determined whether the educational path is managed by the teacher or directly by the student.

2. The utilisation of information and communication technologies (ICT) in the creation of virtual reality (VR) and augmented reality (AR) involves the creation of interactive simulation environments in which learners are able to engage. The

employment of specialised hardware and software complexes (e.g. headsets and applications) has been demonstrated to facilitate a high degree of clarity and cognitive depth during the learning process. In recent years, immersive technologies that simulate the effect of presence in an artificially determined environment have begun to be gradually integrated into the practical sphere of educational activities.

However, despite the large-scale expansion of VR technologies in the entertainment industry and the availability of a number of specialised developments, these tools are still not an integral part of the domestic educational space. The stagnation of the process of introducing ICT into general education organisations is due to a complex of verified factors:

The economic factors that must be considered include the high cost of hardware and licensed software.

The content deficit is defined as the lack of systematically developed and verified specialised educational content.

The issue of staff shortage necessitates the intensification of professional training for teaching staff, with the objective of enhancing their technological and digital literacy.

The following factors must be considered in the context of institutional constraints:

- Excessive administrative centralisation
- Rigidity of management structures in educational institutions

In addition to the aforementioned factors, a latent yet significant reason for the slowdown in the introduction of immersive technologies is the cognitive dissonance between the functional capabilities of existing educational products and the professional expectations of teachers, including the category of innovative teachers.

3. The application of artificial intelligence (AI) in education is determined by three factors. Firstly, there is a need for predictive analysis of unstructured data (Big Data). Secondly, there is a need to generate adaptive learning content. Thirdly, there is a need to automate operational processes. This technological convergence enables teaching staff to reduce the time spent on routine tasks, thereby allowing them to focus their professional resources directly on the implementation of teaching and educational strategies.

Notwithstanding the existence of substantiated outcomes, the integration of AI into educational practice is presently in the nascent stages of development and evaluation. Nevertheless, the level of technological maturity of AI systems allows participants in the educational process – both teachers and students – to reap

significant benefits in the form of a considerable intensification and improvement in the effectiveness of learning.

4. The prevailing legislation in the domain of education dictates the legal validity of the implementation of educational programmes that utilise e-learning and distance learning technologies (DLT). The global pandemic crisis of recent years has catalysed the institutionalisation of distance learning, transforming it into a self-sufficient and fully functional format of didactic interaction.

The accelerated evolution of information and communication technologies is precipitating an augmented demand for online learning among young individuals. This trend is driven by the optimisation of economic costs and the significant savings in students' time resources that are achieved by eliminating the need to travel to the location of the educational organisation.

By 2025, a significant number of educational institutions had transitioned to remote models of operation. This has resulted in a radical expansion of the inclusivity of the educational space, thereby providing equivalent access to intellectual resources for students regardless of their geographical location.

In the course of the analysis of contemporary teaching tools that have been demonstrated to be highly effective in the modern educational environment, the following methods should be highlighted:

1. Training is defined as a format of group interaction focused on intensifying the process of forming and determining applied professional competencies (soft and hard skills) in a classroom setting.

2. Project method (project-based learning) is a cognitive model in which students set their own goals and design algorithms for achieving them. These goals and algorithms are based on verification, selection, and systematic analysis of relevant data.

3. Case studies, as defined by the Merriam-Webster dictionary, are defined as "an analytical study of real, practical cases characteristic of the subject area". The decision-making process involves a multifaceted analysis of the descriptive situation and the generation of an optimal managerial or technological solution.

4. Coaching encompasses a range of educational support services, including tutoring and mentoring, which are provided by teachers, competent students, or invited specialists. This personalised approach to learning ensures that each individual receives the necessary support and guidance to facilitate their academic progress and success. In contradistinction to conventional educational methodologies, coaching emphasises the attainment of quantifiable objectives within a distinct domain of activity.

5. The business game is a simulation model of professional scenarios and processes. Its purpose is twofold: firstly, to transform theoretical constructs into practical experience, and secondly, to develop decision-making skills in quasi-professional activities.

Results and Discussion: The ensuing results and associated discussions are presented herewith: The analysis is representative of only a segment of the prevailing vectors of modern pedagogical technology development. The data presented herein confirm the hypothesis that the integration of innovative methods determines the transition of the educational process to higher levels of interactivity and adaptability. It is hypothesised that the ongoing convergence of technological progress and interdisciplinary research in the field of eduology will facilitate a qualitative leap in the development of educational systems in the near future.

In the context of this study, it is imperative to analyse civil society's perception of the implementation of high technologies in various spheres of life, including the education sector. Empirical evidence indicates that respondents' expectations regarding innovative solutions are focused on areas where technological progress provides verifiable pragmatic benefits, including healthcare, labour activities, and optimisation of living space.

It is evident that the forthcoming decade will signify a period of profound transformation within the global educational paradigm. The contemporary reality that shapes the professional genesis of students is characterised by profound volatility and systemic changes. In this regard, the strategy for reforming higher and secondary education should be focused not on an extensive revision of content or the compilation of new academic disciplines, but on the systematic renovation of pedagogical practices and the modernisation of criteria for verifying educational outcomes.

A predictive analysis of the development of teaching methods and technologies allows the identification of a number of systemic challenges that educational institutions will face in the medium term.

1. The processes of technological adaptation and infrastructure integration are of particular relevance in this context. The increasing influence of the technosphere on individuals' lives necessitates the transformation of educational models. The priority tasks are twofold: firstly, to ensure unhindered access to verified electronic resources, and secondly, to develop convergent educational programmes that integrate high-tech tools.

2. The formation of transversal competencies. In the context of globalisation and permanent socio-economic transformations, the emphasis is shifting from cognitive development to complex anthropological genesis. It is hypothesised that

the importance of social and emotional intelligence, collaboration skills, and critical and predictive thinking will increase.

3. The dissemination of formal and informal education. There is an increasing demand for extracurricular activities. Educational organisations are focused on expanding the range of extracurricular activities (e.g. academic communities, leadership programmes) that complement standardised curricula.

4. Axiological transformation and inclusive environment. The introduction of the principles of multiculturalism, tolerance and social justice into the educational process is becoming increasingly relevant. This process entails the methodical incorporation of ethnocultural components and ethical standards into the curriculum of educational programmes.

5. The primacy of psychophysical well-being. The maintenance of the mental and physical health of students has become a strategic goal of the educational process. The development and implementation of specialised psychological support programmes and coping strategies are imperative in order to mitigate educational stressors.

Conclusion: The modern educational process is characterised by the systematic implementation of innovative teaching technologies, with the aim of intensifying cognitive and creative activity among students. The implementation of these tools has been demonstrated to engender a substantial enhancement in the calibre of pedagogical practice, optimisation of the distribution of teaching time, and minimisation of the proportion of reproductive activity. The reallocation of time for independent study (including homework) enables the educational paradigm to be realigned towards productive and research-based forms of learning.

Consequently, attaining a high level of academic performance and cultivating competitive competencies in the present age is facilitated by the comprehensive introduction of innovations at all hierarchical levels. This encompasses the revision of educational programmes and methodological tools, the modernisation of organisational structures, and the streamlining of administrative management systems.

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