PEDAGOGICAL POTENTIAL OF DIGITAL EDUCATIONAL TECHNOLOGIES IN IDENTIFYING GIFTED STUDENTS AND DEVELOPING THEIR INDIVIDUAL ABILITIES

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ABSTRACT. This article examines the pedagogical potential of digital educational technologies in identifying gifted students and developing their individual abilities. It discusses diagnostic approaches to identifying giftedness, digital platforms, artificial intelligence tools, and personalized learning mechanisms. It also substantiates methodological principles that take into account students' interests, individual needs, and rates of development. The importance of pedagogical observation, adaptive assignments, and feedback in digital environments is highlighted, and directions for developing scientific and methodological recommendations to improve the educational process are identified.

Keywords; gifted students; individual abilities; digital education; artificial intelligence; personalized learning; pedagogical diagnostics; creative thinking; digital platforms; intellectual development; educational technologies.

INTRODUCTION

In the modern education system, identifying each student's individual potential, revealing their intellectual capacity, and consistently developing their existing abilities are among the important pedagogical tasks. In particular, alongside traditional educational approaches, the need to use modern digital technologies when working with gifted students is increasing. This is because students differ in their learning pace, interests, thinking styles, and abilities in particular fields of activity. A uniform educational model that does not take these differences into account may fail to create sufficient conditions for all students to fully demonstrate their potential. Giftedness is a complex pedagogical and psychological phenomenon. It represents a set of individual characteristics that determine a person's potential to achieve high results in a particular type of activity. Giftedness is not limited to high academic achievement or test scores. It may be demonstrated through logical thinking, creativity, independent problem-solving, an inclination toward research, artistic imagination, communication skills, and practical activities. Therefore, identifying gifted students requires more than reliance on a single assessment criterion; their potential across different fields of activity must be examined comprehensively. Digital educational technologies create new opportunities for organizing this process. E-learning platforms, adaptive learning systems, digital diagnostic tools, interactive assignments, and artificial intelligence technologies expand opportunities to monitor students' knowledge, learning pace, and individual interests. These tools make it possible to adapt educational content to students' needs, offer more challenging assignments, and analyze their development over time.

Ra'no Xushbaqova focuses on the theoretical foundations of mechanisms for educating and developing gifted students [1, pp. 126–129]. This line of research demonstrates the importance not only of identifying giftedness but also of creating a pedagogical environment that supports its development. Improving the role of digital technologies and artificial intelligence in modern education is also gaining particular scholarly significance [3, pp. 215–219]. The aim of this study is to provide a theoretical

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analysis of the pedagogical potential of digital educational technologies in identifying gifted students and developing their individual abilities, and to substantiate methodological directions for their use. To achieve this aim, the study examines the pedagogical characteristics of giftedness, the possibilities of digital diagnostics, personalized learning mechanisms, and the conditions required to support students' individual development.

LITERATURE REVIEW

Working with gifted students and identifying and developing their individual abilities is an important research area in pedagogy and psychology. Contemporary scholarly literature examines this issue in close connection with the psychological characteristics of giftedness, the individualization of education, digital pedagogical environments, artificial intelligence, and the possibilities of adaptive learning. The first area covers the theoretical foundations of giftedness and mechanisms for developing gifted students. Ra'no Xushbaqova discusses the theoretical foundations of educating and developing gifted students and emphasizes purposeful pedagogical work with this group [1, pp. 126–129]. M. Maftunaxon examines ways to develop students' intellectual abilities [4, pp. 708–714]. These studies substantiate the need to create pedagogical conditions aimed not merely at identifying giftedness but also at developing it. The second area concerns the opportunities offered by digital technologies in the educational process. P. M. Abduxoliqovich considers ways to improve the role of digital technologies and artificial intelligence in the modern education system [3, pp. 215–219]. M. Tursunov highlights the importance of digital textbooks in education, using programming as an example [5]. These works help explain the role of digital resources in knowledge acquisition, the organization of learning activities, and the expansion of independent learning opportunities. The third area examines the development of individual abilities in digital learning environments. I. V. Polozhentseva, A. I. Baksheev, and A. A. Tagibova focus on developing the individual abilities of gifted young people in digital educational environments [6, pp. 52–59].

E. L. Fedotova and A. S. Seryodkina analyze the importance of an electronic information and educational environment in developing giftedness, using a pedagogical university as an example [7, pp. 40–44]. D. Narkabilova addresses issues related to students' individual characteristics and development [2, pp. 110–116]. The fourth area covers international research. O. A. Alsamani and Y. A. Alsamiri present a scoping review devoted to the use of artificial intelligence in gifted education [8]. A. Vidal-Fernández, M. A. Cipriano, and R. G. Marcos examine digital tools that support personalized education for gifted students through a systematic literature review [9]. I. V. Rudenko and co-authors consider the role of modern technologies in working with gifted students [10].

Overall, the reviewed literature indicates the need to integrate digital technologies, an individualized approach, and pedagogical diagnostics when working with gifted students. At the same time, the integration of identifying giftedness, developing abilities, and monitoring outcomes through digital tools into a unified methodological system requires further in-depth study.

METHODOLOGY

The research methodology is based on organizing the identification of gifted students and the development of their individual abilities through systematic, learner-centered, competency-based, and activity-based approaches. These approaches make it possible to identify students' individual potential, take their interests into account, and adapt educational content to their personal needs. The study is theoretical and methodological in nature and draws on the analysis, comparison, synthesis, and classification of scholarly sources, as well as pedagogical modeling. The systematic approach views work with gifted students as an interconnected pedagogical process. In this process, identification,

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diagnosis, the design of an individual learning pathway, development, and monitoring form a unified system. The learner-centered approach helps create learning conditions suited to each student's abilities, interests, level of knowledge, and learning pace. The proposed methodological model consists of five stages.

The first stage is preliminary identification and pedagogical observation. At this stage, students' interest in academic subjects, inclination toward independent inquiry, creative thinking, ability to solve problem situations, and performance are examined. Teacher observation, interviews, questionnaires, creative assignments, and student portfolios may be used. Giftedness should not be determined solely on the basis of high grades. The second stage is digital diagnostics. Electronic tests, interactive assignments, and digital assessment tools are used to examine a student's level of preparedness in a particular subject or field of activity. Diagnostic results are analyzed together with pedagogical observations and other information. Digital tests are used as an additional source of information rather than as tools for making final judgments independently. The third stage is the development of an individual learning pathway.

Learning objectives, assignments, and areas for development are determined in accordance with each student's interests and abilities. More challenging exercises, independent projects, and additional electronic resources may be used. The fourth stage is development in a digital environment. Students develop their abilities by using e-learning platforms, virtual laboratories, digital libraries, programming environments, and artificial intelligence tools. Assignments are adapted to the student's level of preparation. The fifth stage is monitoring and reflection. Students' development, independent work, projects, and creative products are analyzed. Their achievements are regularly recorded in an electronic portfolio. The key methodological principles include individualization, continuity, openness, pedagogical support, data security, and equal educational opportunities. These principles prioritize students' personal development and educational interests when digital technologies are used.

RESULTS

Theoretical analysis and pedagogical modeling made it possible to systematize the main pedagogical opportunities offered by digital educational technologies for identifying gifted students and developing their individual abilities. These opportunities are manifested in diagnostics, personalized learning, independent inquiry, digital creativity, and development monitoring. The first important result concerns identifying the potential of digital diagnostic tools in the process of recognizing giftedness. Electronic tests, logical reasoning tasks, interactive exercises, and digital observation tools provide additional information about students' aptitudes for particular activities, levels of knowledge, and approaches to completing assignments. Such information helps teachers identify students' strengths and plan subsequent pedagogical activities. However, it is not appropriate to assess giftedness solely through automated tests.

The results should be analyzed together with teacher observations, interviews, creative work, and the student's individual developmental history. The second result is the identification of opportunities for personalized learning. Digital platforms can offer students assignments of varying levels of difficulty, supplementary materials, and independent learning resources. For example, a student interested in natural sciences may explore complex processes through virtual laboratory activities, while a student with strong mathematical abilities may solve logical and algorithmic problems. For students interested in language learning, interactive dictionaries, electronic texts, and speech-development tools are appropriate. The third result concerns the systematization of opportunities provided by artificial intelligence technologies to support individualized learning.

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AI-based educational tools can help explain learning materials, generate additional assignments, analyze texts, and answer students' questions. The study by Alsamani and Alsamiri specifically examines the potential of artificial 4 intelligence in the education of gifted and high-potential students [8]. At the same time, AI-generated recommendations must not replace teachers' pedagogical judgment. The fourth result concerns the importance of electronic portfolios and digital monitoring. An electronic portfolio makes it possible to collect students' projects, creative work, research activities, presentations, and other learning outcomes. It is therefore an important tool for tracking the areas in which students' abilities are developing, assessing their achievements, and setting future development goals.

The fifth result highlights the need to improve pedagogical assessment criteria when working with gifted students. Independent thinking, problem-solving, creativity, the practical application of knowledge, research activity, and the ability to reflect on one's own work are proposed as key criteria. Thus, the theoretical and methodological analysis demonstrates the potential for integrating digital educational technologies into all stages of working with gifted students. The proposed approaches should be tested in practice and adapted to different age groups and subject areas.

DISCUSSION

The use of digital educational technologies to identify gifted students and develop their individual abilities opens up new opportunities in contemporary pedagogical practice. However, effective use of these opportunities requires alignment between the availability of technological tools and pedagogical objectives. Simply introducing a digital platform or artificial intelligence tool into the educational process does not, by itself, develop a student's giftedness. The main outcome depends on the learning activities organized through these tools, the assignments given to students, and the extent to which their individual development is supported. I. V. Polozhentseva, A. I. Baksheev, and A. A. Tagibova discuss the development of the individual abilities of gifted young people in digital learning environments [6, pp. 52–59]. This research direction shows that a digital environment should be viewed not merely as a source of information but as a pedagogical space that supports students' independent inquiry, enables them to demonstrate their potential, and helps them shape individual learning pathways. The systematic literature review by Vidal-Fernández, Cipriano, and Marcos focuses on digital tools that support personalized education for gifted students [9]. This research confirms the relevance of adapting learning materials to individual needs, organizing flexible learning processes, and taking students' developmental characteristics into account.

The use of artificial intelligence also requires particular discussion. Such tools can explain complex topics, generate additional exercises, create assignments at different levels, and support independent inquiry. However, information provided by artificial intelligence may contain errors, inappropriate recommendations, or one-sided approaches. Therefore, students need to be taught to evaluate digital information critically, verify sources, and independently justify the results they obtain. In their study of the importance of modern technologies in working with gifted students, Rudenko and co-authors also draw attention to the pedagogical potential of this area [10]. Another important issue is the risk of digital inequality and subjective assessment in identifying giftedness. Not all students have equal access to the internet, modern devices, and digital resources.

CONCLUSION

As a result, students with greater access to technology may demonstrate better performance, but this does not necessarily mean that their innate abilities are higher. Therefore, diagnostic processes should also take into account social conditions, prior educational opportunities, and individual developmental

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characteristics. In addition, protecting students' personal data, ensuring age-appropriate use of digital platforms, and establishing cooperation with parents are important pedagogical conditions. Teachers should use the results of digital monitoring not to restrict or rigidly classify students, but to provide them with individualized support.

Overall, digital educational technologies have significant pedagogical potential to improve the effectiveness of working with gifted students. However, their benefits can be realized only when they are supported by an individualized approach, qualified pedagogical guidance, information security, and equal educational opportunities.

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