*UDC 376.42:004.9:81’243*

*https://doi.org/10.52058/2786-5274-2025-12(52)-1349-1363*

**Manchuk Valeriia,** Master’s Degree, Psychologist and Behavioral Science specialist in Digital Mental Health, 408 Dundaff Str, Norfolk, VA, 23507, USA, https://orcid.org/0009-0004-9625-0035

**Ponomarevskyi Stanislav**, Doctor of Pedagogical Sciences (Ed. D.), Head of the Department of Psychology, K. D. Ushynskyi Chernihiv Regional Institute of Postgraduate Pedagogical Education, Chernihiv, https://orcid.org/0000-0003-1603-5366

**Novitska Inesa,** Candidate of Pedagogical Sciences (PhD in Pedagogy), Associate Professor, Head of the Postgraduate and Doctoral Studies Department, Associate Professor of the Department of Vocational and Pedagogical Special Education, Andragogy and Management, Educational and Research Institute of Pedagogics, Zhytomyr Ivan Franko State University, Zhytomyr, https://orcid.org/0000-0003-0780-0580

# USING INTERACTIVE LEARNING PLATFORMS TO DEVELOP SPEECH SKILLS OF CHILDREN WITH DISABILITIES

**Abstract.** The relevance of the study lies in the need for scientific substantiation, empirical validation and methodological systematization of the use of interactive educational platforms as a targeted means of forming and correcting speech competencies in children with autism spectrum disorders. The practical significance of the study lies in the fact that the development of scientifically based recommendations for the implementation of interactive platforms can improve the quality of individual correctional and educational work, increase the availability of effective methods in schools and comprehensive rehabilitation centers, and also reduce the burden on specialists through the use of digital tools, the integration of interactive educational platforms into the education system corresponds to modern policies of inclusion and digitalization of education.

The purpose of the study is to theoretically substantiate the possibility of using interactive educational platforms to develop speech skills in children with autism spectrum disorders. The research methodology is based on a large-scale search and analysis of literary sources in leading scientific databases.

As a result of the study, it was found that ASD is a group of neurodevelopmental disorders characterized by varying degrees of severity and variability of symptoms, the etiology of autism spectrum disorders is multifactorial and complex. It was found that open online platforms provide access to a variety of linguistic and language courses,

interactive resources and contribute to the digitalization of education, increasing communicative activity, diversity of learning forms and informativeness of the educational process. Modular digital learning environments open up wide opportunities for personalized organization of the educational process, taking into account the individual needs and characteristics of children with ASD. An interactive whiteboard allows you to adapt exercises to a specific student, adjust the complexity of tasks and use various methods of reinforcement, which contributes to the effective consolidation of speech skills. The interactive floor, combining learning, therapy and play, creates a safe, stimulating and adaptive environment that promotes the comprehensive development of children with autistic features, including motor, cognitive, emotional and communicative competencies. It is worth highlighting specialized platforms based on artificial intelligence, which personalize programs for supporting verbalization, speech, and socialization, complementing the work of specialist.

**Keywords:** interactive learning platforms, information technologies, artificial intelligence, children, autism spectrum disorders, speech and communication competencies.

**Манчук Валерія Ігорівна** магістр, психолог і фахівець з поведінкових наук у сфері цифрового психічного здоров'я, 408 Dundaff Str, Norfolk, VA, 23507, https://orcid.org/0009-0004-9625-0035

**Пономаревський Станіслав Борисович,** доктор педагогічних наук, завідувач кафедри психології, Чернігівський обласний інститут післядипломної педагогічної освіти імені К. Д. Ушинського, м. Чернігів, https://orcid.org/0000-0003-1603-5366

**Новіцька Інеса Василівна,** кандидат педагогічних наук, доцент, завідувач відділу аспірантури та докторантури, доцент кафедри професійно-педагогічної спеціальної освіти, андрагогіки та управління, навчально-науковий інститут педагогіки, Житомирський державний університет імені Івана Франка, м. Житомир, https://orcid.org/0000-0003-0780-0580

## ЗАСТОСУВАННЯ ІНТЕРАКТИВНИХ НАВЧАЛЬНИХ ПЛАТФОРМ ДЛЯ РОЗВИТКУ МОВЛЕННЄВИХ НАВИЧОК ДІТЕЙ ІЗ РАС

**Анотація.** Актуальність дослідження полягає в необхідності наукового обґрунтування, емпіричної валідації та методичної систематизації застосування інтерактивних навчальних платформ як цілеспрямованого засобу формування та корекції мовленнєвих компетенцій у дітей із розладами аутистичного спектра (далі – РАС). Практична значущість дослідження полягає в науковому обґрунтуванні рекомендацій для впровадження інтерактивних платформ. Це дасть

змогу підвищити ефективність індивідуальної корекційної та навчальної роботи, зробити доступнішими перевірені методики в школах і центрах комплексної реабілітації, а також знизити навантаження на фахівців завдяки застосуванню цифрових інструментів. Така інтеграція інтерактивних навчальних платформ відповідає сучасним політикам інклюзії та цифровізації навчання.

Мета дослідження полягає в теоретичному обґрунтуванні можливості застосування інтерактивних навчальних платформ для розвитку мовленнєвих навичок дітей із РАС. Методологія дослідження ґрунтується на систематичному пошуку, критичному аналізі та синтезі літературних джерел, зібраних у провідних наукових базах даних.

У результаті дослідження з'ясовано, що РАС – це група нейророзвиткових порушень, які характеризуються різним ступенем вираженості та варіативністю симптомів. Етіологія цих розладів є багатофакторною та комплексною. Здійснений аналіз свідчить, що відкриті онлайн-платформи забезпечують доступ до різних мовних курсів, інтерактивних ресурсів, сприяють цифровізації освіти, підвищуючи комунікативну активність, різноманітність форм навчання та інформативність освітнього процесу. Модульні цифрові середовища відкривають широкі можливості для персоналізованого освітнього процесу, враховуючи індивідуальні потреби й особливості дітей із РАС. Інтерактивна дошка дає змогу адаптувати вправи до можливостей конкретного здобувача освіти, регулювати складність завдань та використовувати різні способи підкріплення, що сприяє ефективному закріпленню мовленнєвих навичок. Інтерактивна підлога створює безпечне, стимулювальне й адаптивне середовище, що поєднує навчання, терапію та гру. Це сприяє всебічному розвитку дітей з аутистичними особливостями, зокрема їхніх рухових, когнітивних, емоційних та комунікативних компетенцій. Окремо варто виокремити спеціалізовані платформи на основі штучного інтелекту, які персоналізують програми підтримки вербалізації, мовлення та соціалізації, доповнюючи роботу зі спеціалістами.

**Ключові слова:** інтерактивні навчальні платформи, інформаційні технології, штучний інтелект, діти, розлади аутистичного спектра, мовленнєві та комунікаційні компетентності.

**Introduction.** The relevance of research on the application of interactive learning platforms for developing speech skills in children with ASD is driven by a combination of socio-pedagogical, clinical, and technological trends. The increasing prevalence of ASD diagnoses and rising demands for inclusive education require educational institutions to provide effective, differentiated approaches to developing communicative abilities. This is particularly relevant for children in whom traditional verbal methods are insufficiently effective. Speech impairments in ASD cases vary in nature, ranging from speech development delays to pragmatic and interactive communication disorders. This necessitates the application of flexible learning tools adapted to individual ability profiles and behavioral characteristics of the learner.

The practical significance of the investigated problem lies in the fact that the development of scientifically grounded recommendations for implementing interactive learning platforms will directly contribute to improving the quality of individual correctional work, expanding access to effective methods in educational institutions and comprehensive rehabilitation centers, and reducing the workload on specialists through the use of digital tools for intermediate or supplementary therapy. Moreover, the integration of such platforms into the education system aligns with contemporary policies of inclusion and educational digitalization, making the research relevant for educational program developers and relevant government agencies.

**Literature Review.** Contemporary scientific research in the field of education, particularly in the context of inclusion, emphasizes the growing importance of applying artificial intelligence (AI) technologies. Their implementation opens new opportunities for managing and evaluating the educational process, developing life and professional competencies, and ensuring lifelong learning, particularly for individuals with special educational needs (SEN).

A number of contemporary scholars (L. Drozd [1]; N. Leshchii [2]; H. Atturu, S. Naraganti, B. Rao [3]; A. Frolli, A. Cavallaro, I. La Penna, S. Sica, D. Bloisi [4]) dedicate their research to analyzing the characteristics of applying interactive learning technologies in working with children with ASD, considering the perspectives of educators, speech-language pathologists, and other specialists. Such work is aimed at studying the level of implementation of educational programs and digital learning tools in special education, as well as evaluating educators' attitudes toward applying innovative technologies in the process of developing speech skills in children with SEN.

Individual researchers (T. McFayden, S. Bristol, O. Putnam, C. Harrop [5]) focus attention on studying educators' attitudes toward using interactive chatbots in teaching learners with disorders, considering them as an effective tool for communication support. Other scholars (P. Anagnostopoulou, V. Alexandropoulou, G. Lorentzou, A. Lykothanasi, P. Ntaountaki, A. Drigas [6]; A. J. M. Driessen [7]; T. Ghosh, M. Al Banna, M. Rahman, M. Kaiser, M. Mahmud, A. Hosen, G. Cho [8]) analyze factors influencing the application of AI technologies in educating children with ASD, particularly the level of professional awareness, technical preparation of educators, motivation to use innovative tools, and availability of methodological support.

Some researchers (O. Lanskykh, T. Dernova, I. Riabtseva [9]; A. Alzahrani [10]; A. Hassan [11]) focus attention on practical aspects of implementing interactive learning platforms in the rehabilitation process and speech development of children with SEN, particularly those with ASD or intellectual disabilities. Researchers report both positive results of integrating such technologies, particularly improved communicative activity and increased interest in learning, as well as challenges faced by educators and parents: technical difficulties, insufficient digital competencies, and lack of adapted educational resources.

Some researchers (H. Desouki [12]; S. Lorenzo, G. Meliá, A. Lorenzo-Lledó, D. Gadzhimusieva, A. Cerdán-Chacón [13]; M. Xu, V. Calhoun, R. Jiang, W. Yan, J. Sui [14]) examine the attitudes of children with ASD manifestations toward the use of interactive online platforms. The results of such research indicate that most of them respond positively to game-based, visual, and dynamic learning formats, which stimulates the development of their communicative and speech abilities, promotes socialization, and fosters self-confidence.

Scholars Ch. Lebenhagen, J. Dynia [15]; S. Sani-Bozkurt, S. Vuran, Y. Akbulut [16] confirm that the application of interactive technologies in educating children with ASD is a promising direction that requires systematic support for educators and further improvement of digital resources to ensure effective development of speech competence.

AI, according to I. Arpaci, represents an important direction in the development of interactive computer-based learning, the purpose of which is to model human intelligence through the creation of programs capable of reproducing human cognitive activity [17]. A complex of virtual technologies designed for organizing educational activities with individuals who have ASD is proposed by A. Anderson [18]. Turkish scholars (A. F. AL Dawodi et al. [19]) substantiate the possibilities of adapting children with ASD to social and educational activities through contemporary online technologies and educational platforms.

Thus, the application of interactive learning platforms for developing speech skills in children with ASD enables effective overcoming of learning challenges. Their value lies in identifying advantages, analyzing areas of difficulty, and constructing pathways for their correction. Such technologies help learners better navigate the educational environment while enabling educators to adapt teaching methods according to the cognitive and emotional characteristics of children with autism, which overall increases the effectiveness of the educational process.

**The aim of the article** is to theoretically substantiate the possibilities of applying interactive learning platforms for developing speech skills in children with ASD.

Research objectives:

1) to determine the characteristics of ASD manifestation in children;

2) to analyze contemporary interactive educational platforms;

3) to ascertain the possibilities of their application for developing speech skills in children with ASD.

**Research Results.** Over the past two decades, a notable increase in the prevalence of ASD has been observed. According to data from the Centers for Disease Control and Prevention (CDC), estimates from the Autism and Developmental Disabilities Monitoring (ADDM) Network indicate that in 2020, autism spectrum disorder was identified in one out of 36 eight-year-old children [20]. This is accompanied by active public discussions that typically contain controversial or inaccurate information. A significant portion of this discourse is formed in the internet

space, which serves as the primary source of information for parents and caregivers seeking verified information about autism. In this context, intelligent communication systems such as ChatGPT-4, which function on a question-and-answer principle, are considered promising tools for navigating large volumes of data and increasing user awareness.

In scientific discourse, ASD is understood as a complex neurodevelopmental disorder characterized by limitations in social communication and interaction, as well as stereotypical and repetitive behavior patterns [14]. Children with ASD typically experience difficulties establishing joint attention, social reciprocity, and using verbal and nonverbal means of communication. Such impairments lead to social isolation and limitations in interaction with the surrounding world. Early diagnosis and targeted pedagogical intervention significantly improve speech development, communicative abilities, and the overall level of adaptation in children with autism.

Innovative strategies for applying interactive learning platforms are considered one of the most promising directions in creating educational programs and services for individuals with SEN [7]. Such technologies are capable of considering the individual characteristics of each learner, predicting behavioral responses, and adapting the educational process to their capabilities and pace of material acquisition. Interactive learning programs based on AI technologies enable the creation of personalized educational trajectories, providing adaptive reinforcement and support. This facilitates the development of life and communicative skills and helps overcome daily challenges associated with developmental characteristics.

Over the past twenty-five years, the active implementation of interactive technologies in education has led to the emergence of new educational standards and practices that combine traditional pedagogical approaches with innovative technological solutions. The result is the creation of an interactive, dynamic environment that increases learners' motivation, activates their participation in the educational process, and promotes development.

The application of educational online platforms to support children with ASD is becoming increasingly widespread in contemporary pedagogical practice. Interactive learning platforms have demonstrated high effectiveness in improving behavioral responses, speech development, and communication and social skills in such children. Technological solutions based on contemporary information technologies offer a wide range of opportunities for learning, social integration, and improving the quality of life for individuals with autism. They represent a powerful auxiliary tool in their education and development.

Intervention in the educational process of children with ASD using contemporary interactive technologies is based on the integration of several interrelated components that function cohesively, ensuring scientific validity, research objectivity, and reliability of results evaluation. This approach is oriented toward harmonious combination of theoretical knowledge with practical experience, ensuring the creation of effective educational tools. They are developed based on data previously entered

into the system, enabling learners to use them in the educational process even before product development is completed.

The fundamental idea of applying AI technologies, proposed by I. Arpaci [17], lies in creating software that imitates human cognitive processes to solve non-standard tasks, learn from experience, and make informed decisions. Programs developed using interactive online platforms help children with less experience master new knowledge and skills, providing gradual transition from simple to more complex tasks. They stimulate independent learning, experimentation, and development of critical thinking. In this process, the educator performs the function of a mentor who not only guides the learner in interaction with the interactive learning system but also helps interpret the obtained results, adapting the educational process to individual needs. Despite growing interest in ChatGPT's capabilities, experimental research evaluating its effectiveness as a means of providing information about autism for parents and caregivers has not yet been conducted.

Children with ASD are typically characterized by inconsistent and unpredictable behavior, as well as pronounced difficulties in verbal communication. In many cases, they replace speech with gestures, facial expressions, or hand movements, which complicates the process of understanding their needs by parents or educators. Early detection of autism signs and timely intervention are important factors that help improve the quality of communication and social adaptation. Contemporary assistive technologies, particularly educational online systems, combined with machine learning and interactive learning algorithms, open new opportunities for supporting children with autism. Such intelligent solutions enable compensation for limitations in verbal and nonverbal communication, facilitate diagnosis, behavioral manifestation monitoring, and improvement of quality of life for children with ASD through accurate understanding of their needs and states.

Contemporary achievements in the field of educational interactive technologies open new prospects for their application in child health care, particularly in early diagnosis of developmental disorders. Timely identification of such disorders is crucial for the child's subsequent successful development; therefore, the use of intelligent technologies is considered one of the most effective tools for supporting early intervention.

At the same time, the implementation of innovative approaches and methods aimed at overcoming speech and cognitive difficulties, developing social skills, and supporting the emotional-psychological state of children with ASD acquires particular importance [2, p. 67].

Interactive educational technologies that can be applied for diagnosis and teaching children with ASD include robot Q-T, interactive whiteboards, SIRI, and Alexa, on the basis of which environments can be created that help such children master daily living skills. This can improve the ability of individuals with ASD to perform certain tasks and collaborate effectively in the workplace, which will facilitate their full integration and utilization of hidden potential.

Analysis of interactive educational resources enables structuring of interactive educational platforms (Fig. 2):

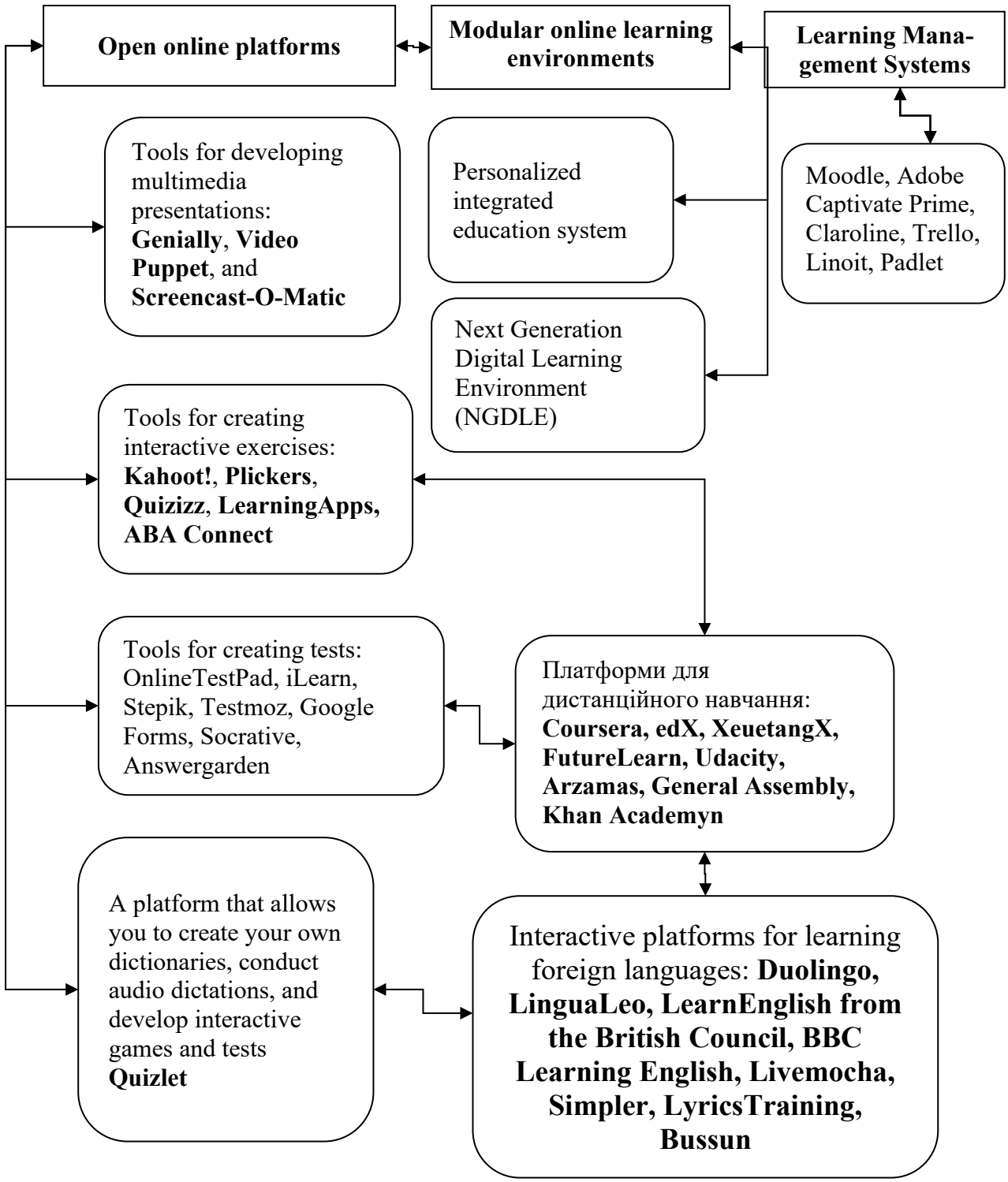


Fig. 2. Interactive educational platforms

Source: created by the authors

Open online platforms provide access to various language courses, interactive educational resources, and promote educational digitalization, diversify learning formats, and improve communication and informativeness of the educational process. This block of interactive platforms includes tools for developing multimedia presentations, particularly Genially, Video Puppet, and Screencast-O-Matic; tools for creating interactive exercises, such as Kahoot!, Plickers, Quizizz, LearningApps, ABA Connect; tools for creating tests: OnlineTestPad, iLearn, Stepik, Testmoz, Google Forms, Socrative, Answergarden; a platform that enables creation of custom dictionaries, conducting audio dictations, and developing interactive games and tests, Quizlet; distance learning platforms: Coursera, edX, XuetangX, FutureLearn, Udacity, Arzamas, General Assembly, Khan Academy; interactive platforms for foreign language learning: Duolingo, LinguaLeo, LearnEnglish from British Council, BBC Learning English, Livemocha, Simpler, LyricsTraining, Busuu [9, p. 21].

Modular digital educational environments, such as PIES (Personalized Integrated Educational System) and NGDLE (Next Generation Digital Learning Environment) [6, p. 102], open wide opportunities for organizing the educational process considering the individual needs of individuals with ASD. These platforms are characterized by a high level of adaptability and interactivity, which facilitates the formation of speech competence based on personalized approaches.

PIES ensures integration of various educational modules adapted to each learner's developmental level, communicative and cognitive abilities. The system enables formation of individual educational trajectories, applying various methods of stimulating speech development, particularly interactive exercises, game scenarios, and audio and video materials. Special attention is given to developing vocabulary, grammatical structures, communicative strategies, and social interaction skills in individuals with ASD. The platform's modular structure allows educators to adjust learning pace and task complexity according to learners' individual needs, which facilitates more effective material acquisition.

NGDLE is oriented toward creating an interactive next-generation digital environment that integrates educational resources, data analysis tools, and feedback systems. For individuals with ASD, NGDLE can become an effective tool for developing speech competence, as it enables application of adaptive exercises, integration of multimedia materials, and provides the capability for real-time monitoring of learner progress. The platform supports flexible interaction among the learner, educator, and parents, ensuring a comprehensive system for teaching and developing communicative skills.

Through the application of PIES and NGDLE, individuals with ASD gain the opportunity to actively participate in the educational process, develop speech skills in an interactive and adaptive environment, increase their level of learning independence, and effectively interact with their surroundings. Furthermore, these platforms enable educators and specialists to obtain analytical data on each learner's progress, which facilitates planning of further strategies and personalization of the educational process.

Thus, the use of modular digital educational environments PIES and NGDLE represents a promising approach in developing speech competence in children with ASD, combining personalized learning, interactivity, and effective application of digital technologies to support SEN.

Contemporary digital platforms such as LMS (Learning Management System) and LCMS (Learning Content Management System) provide educators and specialists with powerful tools for organizing and optimizing the educational process, particularly for working with children with ASD. Examples of such systems include Moodle, Adobe Captivate Prime, Claroline, as well as interactive platforms for collaborative work and organizing educational activities, such as Trello, Linoit, Padlet [17].

The application of LMS enables educators to plan the educational process, create and structure learning materials, conduct online classes, assess learners' knowledge, and track their progress in real time. For individuals with ASD, this is particularly important, as they require clear organization of the educational environment, visual instructions, and a structured approach. LMS allows division of learning material into logical modules, adapting its complexity and teaching pace to the individual needs of each learner.

LCMS systems provide the capability for centralized storage, editing, and distribution of educational content. Using LCMS, educators can create multimedia materials, interactive exercises, tests, dictionaries, and educational games that stimulate development of speech competence, cognitive and social skills in children with ASD. Additionally, LCMS enables flexible modification of educational content according to the needs of a specific learner, which facilitates personalized learning and supports an inclusive approach.

Tools for organizing collaborative work and visual communication, such as Trello, Linoit, and Padlet, enable creation of interactive boards, planners, and projects through which children with ASD can actively participate in the educational process. They facilitate development of planning, organization, and sequential task completion skills, and also increase motivation for learning through game-based and visual elements [1, p. 334].

The integrated use of LMS and LCMS platforms enables educators to manage the learning process, integrate diverse types of content, tailor assignments to the individual needs of learners, and create a safe, structured, and stimulating educational environment. For children with ASD, this approach enhances learning effectiveness, supports the development of speech and communication skills, and allows learners to engage independently with educational materials at a pace that suits them.

Thus, LMS and LCMS platforms are not merely tools for digitalizing the educational process; they also serve as essential means of personalizing and optimizing education for individuals with ASD, providing a structured, interactive, and adaptive learning environment.

For children with ASD, an interactive whiteboard can be an effective tool for developing speech skills, particularly for sound automation. When used with a small

group of learners, the whiteboard allows educators to combine instruction with interactive computer games, creating an engaging and motivating environment. The gamified format fosters a relaxed and informal atmosphere, encouraging learners to participate actively in the educational process. While performing tasks in an interactive environment, children can repeatedly practice target sounds, receiving immediate feedback from the system or educator. This approach promotes natural skill reinforcement, as learning occurs through play, where the learner is both interested and motivated to complete tasks. Moreover, the interactive whiteboard enables personalization of exercises to meet individual needs, adjustment of task difficulty, and selection of reinforcement options, which is particularly important for learners with ASD. Therefore, the use of an interactive whiteboard in combination with computer games creates an effective, adaptive, and motivating educational environment that supports not only sound automation but also the development of attention, social interaction, and general communication skills.

An interactive floor represents an innovative technology in education and rehabilitation, combining learning and play within an interactive environment. It consists of integrated components (a projector and motion sensors) that respond to movement and actions. This technology allows children with ASD to interact directly with projected images on the floor while performing educational and developmental tasks.

This technology has a multifunctional purpose, supporting the development of motor, cognitive, emotional, and social skills in learners. The interactive floor stimulates motor activity and movement coordination through active physical exercises while simultaneously enhancing attention, thinking, memory, and decision-making abilities. For emotional development, it provides a safe and encouraging environment where learners can experiment, play, and interact with others.

Educators and specialists can utilize various software packages and interactive scenarios, such as game zones shaped like football fields, floral arrangements, animated storylines, and other thematic images. These scenarios motivate learners to complete assigned tasks, promote engagement, and help achieve educational objectives. The flexibility of the settings allows tasks to be adapted to the developmental level of each learner, making this tool an effective means of personalized learning and rehabilitation for individuals with ASD.

Thus, the interactive floor integrates learning, therapy, and play, creating a stimulating, safe, and adaptive environment that fosters the holistic development of children with ASD and supports the formation of their communicative and emotional competence.

**Conclusions.** The study of interactive learning platforms for the development of speech skills in individuals with ASD has shown that autism spectrum disorders represent a group of neurodevelopmental conditions characterized by varying degrees of severity and a wide range of symptoms. Each individual with ASD has a unique profile of cognitive characteristics, emotional and volitional traits, communicative

behavior, and social interaction. This variability requires a personalized approach to learning, support, and development. The findings confirm that the etiology of autism spectrum disorders is multifactorial and complex. Despite substantial progress in understanding the phenomenon, its exact causes remain undetermined. Potential risk factors include genetic predispositions, environmental influences, medical and biological conditions affecting the mother or child during prenatal development, and specific features of early neurodevelopment. These factors do not operate in isolation; instead, they interact within a complex system that shapes each individual's pattern of ASD manifestations.

The results of the study indicate that open online platforms provide access to diverse language courses and interactive resources. This contributes to the digitalization of education, increases learners' communicative engagement, enriches the educational process with information, and significantly diversifies learning formats. Modular digital environments offer extensive opportunities for personalized organization and management of the educational process, taking into account the individual needs and characteristics of children with ASD. An interactive whiteboard allows the adaptation of exercises to the characteristics of a particular learner, adjustment of task difficulty, and use of different reinforcement strategies, which supports effective consolidation of speech skills. Interactive floor systems integrate instruction, therapy, and play, creating a safe, stimulating, and adaptive environment that promotes the holistic development of children with ASD, including improvements in motor, cognitive, emotional, and communicative competencies. Therefore, the use of interactive educational technologies is a promising and effective approach to developing speech skills in children with ASD, enhancing personalization, motivation, and overall educational effectiveness.

Future research should focus on determining the potential for using modern interactive educational resources to support the effective development of communication skills in children with ASD.

***References:***

1. Drozd, L. (2023). Vydy suchasnykh innovatsiynykh tekhnolohiy v lohopedychniy roboti. [Types of modern innovative technologies in speech therapy work]. *Grail of Science*, *25,* 333–338. https://doi.org/10.36074/grail-of-science.17.03.2023.057 [in Ukrainian].

2. Leshchiy, N. P. (2025). Interaktyvni tekhnolohiyi v lohopedychniy praktytsi dlya ditey z rozladamy autychnoho spektru. [Interactive technologies in speech therapy practice for children with autism spectrum disorders]. *Profesiyno-prykladni dydaktyky – Professional and applied didactics, 1*, 67-10. https://doi.org/10.37406/2521-6449/2025-1-11 [in Ukrainian].

3. Atturu, H., Naraganti, S., & Rao, B. R. (2025). Effectiveness of Artificial Intelligence–Based Platform in Administering Therapies for Children With Autism Spectrum Disorder: 12-Month Observational Study. *JMIR Neurotech*, *4,* 70589. https://doi.org/10.2196/70589

4. Frolli, A., Cavallaro, A., La Penna, I., Sica, S. L., & Bloisi, D. (2024). Artificial intelligence and autism spectrum disorders: a new perspective on learning. *Proceedings of the Digital Innovations for Learning and Neurodevelopmental Disorders* (Rome, May 24–25, 2024). Rome, Italy. Retrieved from https://ceur-ws.org/Vol-3751/paper3.pdf

5. McFayden, T. C., Bristol, S., Putnam, O., & Harrop, C. (2024). ChatGPT: Artificial Intelligence as a Potential Tool for Parents Seeking Information About Autism. *Cyberpsychology, Behavior, and Social Networking, 27* (2). https://doi.org/10.1089/cyber.2023.0202

6. Anagnostopoulou, P., Alexandropoulou, V., Lorentzou, G., Lykothanasi, A., Ntaountaki, P., & Drigas, A. (2020). Artificial intelligence in autism assessment. *International Journal of Emerging Technologies in Learning (iJET)*, *15*(6), 95–107. https://doi.org/10.3991/ijet.v15i06.11231

7. Driessen, A. J. M. (2025). Applications of Artificial Intelligence and Smart Learning Methods for Children with Autism Spectrum Disorder: A Proposed Interactive Platform. *Artificial intelligence*. Retrieved from https://surl.li/tujzzk

8. Ghosh, T., Al Banna, M. H., Rahman, M. S., Kaiser, M. S., Mahmud, M., Hosen, A. S., & Cho, G. H. (2021). Artificial intelligence and Internet of things in screening and management of autism spectrum disorder. *Sustainable Cities and Society*, *74*, 103189. Retrieved from https://pure.kfupm.edu.sa/en/publications/artificial-intelligence-and-internet-of-things-in-screening-and-m/

9. Lanskykh, O. B., Dernova, T. A., & Ryabtseva, I. A. (2022). Rol interaktyvnykh platform u vyvchenni inozemnykh mov. [The role of interactive platforms in learning foreign languages]. *Innovatsiyna pedahohika – Innovative pedagogy*, *44*(2), 18–23. https://doi.org/10.32843/2663-6085/2022/44/2.3 [in Ukrainian].

10. Alzahrani, A. N. (2024). Educational Mobile Apps Enhancing Communication Skills in Children With Autism in Arab Countries. *International Journal of Information and Communication Technology Education*, *20*(1). https://doi.org/10.4018/IJICTE.359439

11. Hassan, A. O. (2021). Interactive Vocabulary Learning Application for Children with Autism Spectrum Disorder: A Participatory Design Study. *Manara – Qatar Research Repository*. Retrieved from https://surl.li/vccjpd

12. Desouki, H. A. (2020). Socio-psychological integration of special needs individuals in light of artificial intelligence applications: A future vision. *Arab Journal of Disability and Talent Sciences*, *Arab Foundation for Education, Science, and Arts*, *14,* 619–630.

13. Lorenzo, G., Meliá, S., Lorenzo-Lledó, A., Gadzhimusieva, D., & Cerdán-Chacón, A. (2025). The application of artificial intelligence in educational environments for autistic learners: analysis of research lines using VOSviewer. *Interactive Technology and Smart Education*. https://doi.org/10.1108/ITSE-04-2025-0081

14. Xu, M., Calhoun, V., Jiang, R., Yan, W., & Sui, J. (2021). Brain imaging-based machine learning in autism spectrum disorder: methods and applications. *Journal of neuroscience methods*, *361*, 109271. https://doi.org/10.1016/j.jneumeth.2021.109271

15. Lebenhagen Ch., Dynia J. (2024). Factors Affecting Autistic Students' School Motivation. *Education Sciences*, *14*(5), 527. https://doi.org/10.3390/educsci14050527

16. Sani-Bozkurt, S., Vuran, S., & Akbulut, Ya. (2017). Design and Use of Interactive Social Stories for Children with Autism Spectrum Disorder (ASD). *Contemporary Educational Technology*, *8*(1), 1–25. Retrieved from https://www.cedtech.net/article/design-and-use-of-interactive-social-stories-for-children-with-autism-spectrum-disorder-asd-6184

17. Arpaci, I. (2019). A hybrid modeling approach for predicting the educational use of mobile cloud computing services in higher education. *Computers in Human Behavior*, *90,* 181–187. https://doi.org/10.1016/j.chb.2018.09.005

18. Anderson, A. (2019). *Virtual reality, augmented reality and artificial intelligence in special education: a practical guide to supporting students with learning differences*. Los Angeles: Routledge. Retrieved from https://surl.li/aeiouy

19. AL Dawodi, A. F., Alzahrani, S. F., Almumtin R. A., … & Almarashdeh, I. (2020). Developing and Implementing an Online Learning Platform for Children with Autism. *International Journal of Scientific Research in Science and Technology, 7*(2), 176–188. https://doi.org/10.32628/IJSRST207162

20. Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years – Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2020. (2023). *CDC: website.* Retrieved from https://www.cdc.gov/mmwr/volumes/72/ss/ss7202a1.htm

***Література:***

1. Дрозд Л. Види сучасних інноваційних технологій в логопедичній роботі. *Grail of Science*. 2023. № 25. С. 333–338. DOI: https://doi.org/10.36074/grail-of-science.17.03.2023.057

2. Лещій Н. П. Інтерактивні технології в логопедичній практиці для дітей з розладами аутичного спектру. *Професійно-прикладні дидактики*. 2025. № 1. С. 67–70. DOI: https://doi.org/10.37406/2521-6449/2025-1-11

3. Atturu H., Naraganti S, Rao B. R. Effectiveness of Artificial Intelligence–Based Platform in Administering Therapies for Children With Autism Spectrum Disorder: 12-Month Observational Study. *JMIR Neurotech*. 2025. Vol. 4. Article 70589. DOI: https://doi.org/10.2196/70589

4. Frolli A., Cavallaro A., La Penna I., Sica S. L., Bloisi D. Artificial intelligence and autism spectrum disorders: a new perspective on learning. *Proceedings of the Digital Innovations for Learning and Neurodevelopmental Disorders* (Rome, May 24–25, 2024). Rome, Italy, 2024. URL: https://ceur-ws.org/Vol-3751/paper3.pdf (дата звернення: 05.11.2025).

5. McFayden T. C., Bristol S., Putnam O., Harrop C. ChatGPT: Artificial Intelligence as a Potential Tool for Parents Seeking Information About Autism. *Cyberpsychology, Behavior, and Social Networking*. 2024. Vol. 27. № 2. DOI: https://doi.org/10.1089/cyber.2023.0202

6. Artificial intelligence in autism assessment / P. Anagnostopoulou et al. *International Journal of Emerging Technologies in Learning (iJET)*. 2020. Vol. 15. № 6. P. 95–107. DOI: https://doi.org/10.3991/ijet.v15i06.11231

7. Driessen A. J. M. Applications of Artificial Intelligence and Smart Learning Methods for Children with Autism Spectrum Disorder: A Proposed Interactive Platform. *Artificial intelligence*. 2025. URL: https://surl.li/tujzzk (дата звернення: 05.11.2025).

8. Artificial intelligence and Internet of things in screening and management of autism spectrum disorder / T. Ghosh et al. *Sustainable Cities and Society*. 2021. Vol. 74. Article 103189. URL: https://pure.kfupm.edu.sa/en/publications/artificial-intelligence-and-internet-of-things-in-screening-and-m/ (дата звернення: 05.11.2025).

9. Ланських О. Б., Дернова Т. А., Рябцева І. А. Роль інтерактивних платформ у вивченні іноземних мов. *Інноваційна педагогіка*. 2022. Вип. 44. Т. 2. С. 18–23. DOI: https://doi.org/10.32843/2663-6085/2022/44/2.3

10. Alzahrani A. N. Educational Mobile Apps Enhancing Communication Skills in Children With Autism in Arab Countries. *International Journal of Information and Communication Technology Education*. 2024. Vol. 20. № 1. DOI: https://doi.org/10.4018/IJICTE.359439

11. Hassan A. O. Interactive Vocabulary Learning Application for Children with Autism Spectrum Disorder: A Participatory Design Study. *Manara – Qatar Research Repository.* 2021. URL: https://surl.li/vccjpd (дата звернення: 05.11.2025).

12. Desouki H. A. Socio-psychological integration of special needs individuals in light of artificial intelligence applications: A future vision. *Arab Journal of Disability and Talent Sciences*, *Arab Foundation for Education, Science, and Arts*. 2020. Vol. 14. P. 619–630.

13. Lorenzo G., Meliá S., Lorenzo-Lledó A., Gadzhimusieva D., Cerdán-Chacón A. The application of artificial intelligence in educational environments for autistic learners: analysis of research lines using VOSviewer. *Interactive Technology and Smart Education*. 2025. DOI: https://doi.org/10.1108/ITSE-04-2025-0081

14. Xu M., Calhoun V., Jiang R., Yan W., Sui J. Brain imaging-based machine learning in autism spectrum disorder: methods and applications. *Journal of neuroscience methods*. 2021. Vol. 361. Article 109271. DOI: https://doi.org/10.1016/j.jneumeth.2021.109271

15. Lebenhagen Ch., Dynia J. Factors Affecting Autistic Students' School Motivation. *Education Sciences.* 2024. Vol. 14. № 5. Article 527. DOI: https://doi.org/10.3390/educsci14050527

16. Sani-Bozkurt S., Vuran S., Akbulut Ya. Design and Use of Interactive Social Stories for Children with Autism Spectrum Disorder (ASD). *Contemporary Educational Technology*. 2017. Vol. 8. № 1. P. 1–25. URL: https://www.cedtech.net/article/design-and-use-of-interactive-social-stories-for-children-with-autism-spectrum-disorder-asd-6184 (дата звернення: 05.11.2025).

17. Arpaci I. A hybrid modeling approach for predicting the educational use of mobile cloud computing services in higher education. *Computers in Human Behavior*. 2019. Vol. 90. P. 181–187. DOI: https://doi.org/10.1016/j.chb.2018.09.005

18. Anderson A. Virtual reality, augmented reality and artificial intelligence in special education: a practical guide to supporting students with learning differences. Los Angleos: Routledge, 2019. 124 p. URL: https://surl.li/aeiouy (дата звернення: 05.11.2025).

19. Developing and Implementing an Online Learning Platform for Children with Autism / A. F. AL Dawodi et al. *International Journal of Scientific Research in Science and Technology.* 2020. Vol. 7. № 2. P. 176–188. DOI: https://doi.org/10.32628/IJSRST207162

20. Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years – Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2020. *CDC: вебсайт.* 2023. URL: https://www.cdc.gov/mmwr/volumes/72/ss/ss7202a1.htm (дата звернення: 05.11.2025).