FORMATION OF FOREIGN LANGUAGE COMPETENCE OF A FUTURE SPECIALIST USING MODERN DIGITAL TECHNOLOGIES

ФОРМУВАННЯ ІНШОМОВНОЇ КОМПЕТЕНТНОСТІ МАЙБУТНЬОГО ФАХІВЦЯ ЗАСОБАМИ СУЧАСНИХ ЦИФРОВИХ ТЕХНОЛОГІЙ

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The rapid development of digital technologies has significantly transformed the process of acquiring a foreign language, particularly in professional training. This article examines the formation of foreign language competence in future specialists using modern digital tools, emphasizing their role in improving linguistic, communicative and professional skills. Digital platforms, artificial intelligence, virtual learning environments and interactive programs provide an exciting and adaptive learning experience, promoting motivation and engagement. The study highlights the effectiveness of online simulation, gamification and automatic feedback for developing language proficiency and understanding of specialized terminology. The study also examines the challenges associated with digital learning, such as technological dependence and the need for critical evaluation of digital content. The results obtained show that a balanced combination of traditional and digital methodologies optimizes language learning outcomes; The need for continuous pedagogical adaptation to new technical developments is emphasized to ensure the effective formation of foreign language competence in future specialists. The integration of advanced digital technologies into education has changed traditional approaches to learning, offering new opportunities for improving linguistic skills, communicative competence and professional experience. This study examines the impact of digital tools, such as artificial intelligence, online platforms, virtual reality (VR), augmented reality (AR), mobile applications and gamification, on the acquisition of foreign language skills among future specialists. These technologies provide interactive and adaptive learning experiences, facilitating language acquisition through real-life simulation, automated feedback and task-based learning. However, problems such as digital literacy gaps, technological dependency and content reliability require strategic pedagogical solutions. The study highlights the need for a blended approach that combines traditional teaching methods with digital innovations to optimize learning outcomes.

Key words: *foreign language competence, digital technologies, professional training, artificial intelligence, virtual reality, augmented reality, gamification, online education, interactive learning, pedagogical strategies, blended learning.*

Стрімкий розвиток цифрових технологій суттєво трансформував процес оволодіння іноземною мовою, зокрема у професійній підготовці. У цій статті досліджується формування іншомовної компетенції у майбутніх спеціалістів за допомогою сучасних цифрових інструментів, підкреслюється їхня роль у вдосконаленні лінгвістичних, комунікативних і професійних навичок. Цифрові платформи, штучний інтелект, віртуальні навчальні середовища та інтерактивні програми забезпечують захоплюючий та адаптивний досвід навчання, сприяючи мотивації та залученості. Дослідження підкреслює ефективність онлайн-симуляції, гейміфікації та автоматичного зворотного зв'язку для розвитку володіння мовою та розуміння спеціальної термінології. У дослідженні також розглядаються проблеми, пов'язані з цифровим навчанням, такі як технологічна залежність і необхідність критичної оцінки цифрового контенту. Отримані результати показують, що збалансоване поєднання традиційних і цифрових методологій оптимізує результати вивчення мови; підкреслюється необхідність безперервної педагогічної адаптації до нових технічних досягнень для забезпечення ефективного формування іншомовної компетенції у майбутніх спеціалістів. Інтеграція передових цифрових технологій в освіту змінила традиційні підходи до навчання, запропонувавши нові можливості для покращення лінгвістичних навичок, комунікативної компетентності та професійного досвіду. У цьому дослідженні розглядається вплив цифрових інструментів, таких як штучний інтелект, онлайн-платформи, віртуальна реальність (VR), доповнена реальність (AR), мобільні додатки та гейміфікація, на набуття навичок іноземної мови серед майбутніх спеціалістів. Ці технології забезпечую інтерактивний та адаптивний досвід навчання, полегшуючи засвоєння мови за допомогою моделювання реального життя, автоматизованого зворотного зв'язку та навчання на основі завдань. Однак такі проблеми, як прогалини в цифровій грамотності, технологічна залежність і надійність контенту, вимагають стратегічних педагогічних рішень. Дослідження підкреслює необхідність змішаного підходу, який поєднує традиційні методи навчання з цифровими інноваціями для оптимізації результатів навчання.

Ключові слова: *іншомовна компетентність, цифрові технології, професійна підготовка, штучний інтелект, віртуальна реальність, доповнена реальність, гейміфікація, онлайн-освіта, інтерактивне навчання, педагогічні стратегії, змішане навчання.*

General Statement of the Problem. In the modern educational landscape, the development of foreign language competence is a critical requirement for future specialists, particularly in fields that demand high levels of linguistic proficiency, such as translation, interpretation, and international communication.

Traditional teaching methods often fail to provide the dynamic, interactive, and contextually rich environments necessary for effective language acquisition. The rapid advancement of digital technologies offers new opportunities to enhance language learning through innovative tools such as artificial intelligence, virtual reality, gamification, and online

platforms. However, the integration of these technologies into foreign language education presents several challenges, including digital literacy gaps, the need for appropriate pedagogical strategies, and concerns regarding the effectiveness and reliability of digital resources. This study addresses the problem of how modern digital technologies can be effectively utilized to develop foreign language competence in future professionals, ensuring both linguistic accuracy and the ability to apply language skills in real-world professional contexts. It also explores the balance between traditional and digital learning methods to optimize language acquisition and prepare students for the demands of the global workforce.

Analysis of Recent Research and Publications. Recent studies on the integration of digital technologies in foreign language education emphasize their transformative impact on language acquisition, professional training, and student engagement. Scientists Pet'ko, L., Popova, L., Kulyk, O., Kardash, L., Ovsiienko, L., Denysiuk, I. & Proskurniak, O. (2021) who consentrate their attention on Web Oriented Education Course Design Model in the Entrepreneurship Education System. Researchers Rudnik Y., Petryk L., Kosharna N., Dzurulo A., Popova L. (2024) highlight that artificial intelligence (AI)-powered applications, such as language learning chatbots and automated translation tools, enhance vocabulary retention, pronunciation accuracy, and contextual understanding. Studies on gamification and virtual reality (VR) demonstrate that immersive learning environments increase motivation and improve communicative competence by simulating real-world interactions. This phenomenon is discussed in scientific resources of scholars Petryk L., Popova L. and others (2023).

The effectiveness of blended learning approaches has been widely discussed in academic literature. Scholars Batechko, N. (2018). Stepanenko L. (2023) argue that combining traditional methods with digital tools leads to better learning outcomes, as students benefit from structured instruction alongside interactive, self-paced activities (2023). Lipatov, V. discusses the role of formation of professional foreign language competence of the future teacher in the conditions of dual education (2023). Furthermore, research on mobile-assisted language learning (MALL) indicates that mobile applications offer flexibility and accessibility, allowing students to practice language skills beyond the classroom setting (Chen & Li, 2020).

Despite these advancements, challenges remain. Studies highlight concerns regarding the over-reliance on technology, digital literacy gaps among educators and learners, and the need for critical evaluation of online resources (Kessler, 2021). Additionally, research suggests that while digital tools enhance technical skills, they should not replace essential cognitive and interpretative skills required for professional translation and interpretation (Ortega & Pym, 2023).

Overall, recent publications confirm that digital technologies significantly contribute to foreign language competence development but emphasize the necessity of pedagogical adaptation and careful integration into curricula.

Highlighting Previously Unresolved Parts of the Overall Problem. Despite extensive research on the role of digital technologies in foreign language education, several critical issues remain unresolved. One major challenge is determining the optimal balance between traditional and digital learning methods to maximize language acquisition without compromising essential cognitive and critical thinking skills. While digital tools such as artificial intelligence (AI), gamification, and virtual reality (VR) offer engaging learning experiences, their long-term impact on deep language processing, cultural awareness, and professional application remains insufficiently explored.

Another unresolved issue is the variability in digital literacy among educators and learners. Many studies emphasize the benefits of technology-enhanced learning, yet the effectiveness of these tools heavily depends on users' ability to navigate, critically assess, and apply digital resources appropriately. The lack of standardized digital literacy training for both teachers and students creates disparities in learning outcomes and raises concerns about the over-reliance on automated systems.

Furthermore, the ethical implications of AI-driven language learning tools and machine translation remain underexplored. Questions regarding data privacy, biases in AI-generated content, and the potential decline in human translation and interpretation expertise need further investigation. Additionally, research has yet to provide a comprehensive framework for assessing the long-term effectiveness of digital technologies in professional contexts, particularly in fields requiring high linguistic accuracy and contextual sensitivity.

Addressing these unresolved issues is essential to developing a more effective, ethical, and balanced approach to foreign language competence formation in future specialists.

The Purpose of the Article. The purpose of this article is to examine the role of modern digital technologies in the formation of foreign language competence among future specialists. It aims to analyze the effectiveness of various digital tools, including artificial intelligence (AI), virtual and augmented reality (VR/AR), gamification, and mobile-assisted language learning (MALL), in enhancing linguistic proficiency, communicative competence, and professional skills.

Additionally, the article seeks to explore the integration of these technologies into educational curricula, identifying best practices for optimizing language acquisition while addressing potential challenges

such as digital literacy gaps, technological dependence, and the ethical implications of AI-driven language learning. By evaluating recent research and case studies, this study provides insights into the advantages and limitations of digital language learning methods, ultimately contributing to the development of innovative, balanced, and pedagogically sound approaches to foreign language education in professional training.

Presentation of the main material The first appearance of the word "technology" in the context of education dates back to the early 20th century. However, its conceptual roots can be traced even earlier. The term "educational technology" began gaining recognition in the 1920s and 1930s with the introduction of audiovisual aids, such as film projectors, radio broadcasts, and instructional recordings, which were used to enhance traditional teaching methods. One of the earliest scholarly references to technology in education appeared in the mid-20th century, particularly during the post-World War II period, when researchers and educators started systematically studying the role of instructional media and programmed learning. The field of educational technology truly expanded in the 1960s and 1970s with the rise of computers, leading to more structured research on digital learning tools and their impact on education. Several scholars have significantly contributed to the study of *technology in education*, shaping the field through their research and innovations.

Here are some of the key figures, early pioneers of Pre-Digital Era, namely: Edward Thorndike (1874–1949) – A psychologist who introduced *theories of learning that later influenced educational technology*, particularly in programmed instruction; B.F. Skinner (1904–1990) – Developed *the concept of programmed learning*, which led to early computer-based learning models. His work in behaviorism laid the foundation for adaptive learning technologies; Sidney Pressey (1888–1979) – Created the first *teaching machine* in the 1920s, an early attempt at automated instruction. Classical educational technologies refer to *the pre-digital* and *early digital tools and methods* used to enhance teaching and learning. These technologies can be classified into several categories based on their nature and function in education (table 1).

Classical educational technologies provided the foundation for modern digital learning. While many of these tools have been replaced by online platforms, artificial intelligence, and virtual classrooms, they played a crucial role in shaping today's educational landscape [1].

Pedagogy refers to the methods and practices of teaching, and technology in pedagogy involves the integration of various tools, techniques, and digital resources to enhance learning experiences and outcomes. Over time, technological advancements have significantly influenced teaching practices, making them more interactive, efficient, and adaptable to individual learning needs [3].

Now Technology refers to the application of scientific knowledge for practical purposes, particularly in tools, systems, or processes that enhance human capabilities. In the context of education, educational technology refers to tools, systems, and resources (such as digital platforms, software, and hardware)

Table 1

Classification of Classical Technologies in Education

#	Classical Technologies	Examples
1	*Print-Based Technologies* These are the earliest forms of educational technology and remain fundamental in learning.	*Textbooks and Printed Materials* – Books, journals, and worksheets serve as primary sources of knowledge. *Workbooks and Manuals* – Guided exercises for practice and assessment. *Flashcards and Charts* – Visual aids for memorization and reinforcement.
2	*Visual and Display Technologies* These technologies enhance learning through visual representation	*Blackboards and Whiteboards* – Traditional tools for writing and illustrating concepts. *Posters and Wall Charts* – Used to present structured information. *Overhead Projectors (OHPs)* – Enabled teachers to display transparencies with diagrams and text. *Slide Projectors and Filmstrips* – Used for structured lesson presentations with visual sequences.
3	*Audio Technologies* These focus on auditory learning and communication	*Radio Broadcasts* – Educational programs transmitted via radio (e.g., BBC School Radio). *Tape Recorders and Cassette Players* – Used for listening exercises, especially in language learning. *Language Labs* – Equipped with audio systems for pronunciation and listening practice.
4	*Audiovisual Technologies* Combining sight and sound, these technologies enhanced interactive learning.	*Television and Educational Programs* – Documentary series and instructional broadcasts (e.g., PBS, BBC Learning). *Film Reels and VHS Tapes* – Used to deliver recorded lessons and subject-based films. *Laser Discs and DVDs* – Provided high-quality instructional videos before digital streaming.

used to support and enhance teaching and learning processes.

The integration of technology into foreign language learning has transformed the way students acquire new languages, enhancing their ability to communicate effectively in diverse cultural and professional contexts [5].

Modern digital technologies offer innovative and interactive methods of learning, enabling learners to engage with language content in dynamic, individualized, and flexible ways [7]. Key uses of technology in foreign language acquisition include, namely:

1. *Interactive Language Learning Platforms* (Digital tools such as *Duolingo*, *Babbel*, and *Rosetta Stone* offer interactive lessons, where students practice vocabulary, grammar, and pronunciation. These platforms often use gamification to make learning more engaging, motivating students through rewards and levels).

2. *Speech Recognition and Pronunciation Tools* (Technology helps learners improve pronunciation using *speech recognition systems* (e.g., *Google Translate* or *Rosetta Stone*). These tools provide real-time feedback on pronunciation accuracy, allowing learners to refine their speaking skills independently).

3. *Artificial Intelligence and Adaptive Learning* (AI-powered platforms like *Knewton* or *Smart Sparrow* personalize language learning by adapting content to a learner's individual progress and areas of difficulty. This adaptive learning approach ensures that learners move at their own pace, receiving customized lessons and practice exercises based on their needs).

4. *Mobile Learning Applications* (Mobile apps such as *Memrise*, *Busuu*, and *Anki* support language learning on the go. These apps enable learners to practice speaking, listening, and writing in short, manageable sessions, which fits well with busy schedules).

5. *Online Dictionaries and Translation Tools* (Tools like *WordReferenc*e, *Google Translate*, and *Linguee* assist learners in understanding unfamiliar vocabulary and grammar by providing translations, context, and usage examples. These tools also offer the ability to hear correct pronunciation and are invaluable for improving comprehension and speaking skills.

6. *Multimedia and Virtual Reality (VR)* (Tools like *Google Cardboard* or *Oculus VR* create immersive language-learning environments, allowing learners to virtually "travel" to different parts of the world and practice language skills in realistic settings. VR simulations help learners experience the language in authentic contexts, improving both vocabulary and cultural understanding).

7. *Social Media and Online Communities* (Platforms such as *Facebook*, *Instagram*, and *Twitter* provide opportunities for language learners to interact with native speakers or other learners, thus practicing informal communication, cultural exchange, and real-world language use.

Additionally, specialized communities like *Tandem* or *HelloTalk* enable users to find language partners for conversational practice. The integration of technology in language learning has revolutionized the way students acquire and develop linguistic skills (Table 2) [6].

Speaking about benefits of using modern digital technologies in language learning, it is worth noting the innovative and positive features of modern digital technologies, namely: *personalized learning, engagement and motivation, accessibility and convenience, exposure to authentic language, instant feedback and correction, cost-effectiveness* [3].

Modern digital technologies offer personalized learning experiences. AI-powered platforms like *Duolingo* or *Knewton* adapt to the learner's pace, offering tailored lessons based on individual strengths and weaknesses. This adaptability allows learners to progress at their own speed and focus on areas they find most challenging, leading to more effective learning outcomes [11].

Table 2

Technology Integration in Language Learning

#	Technology	Examples
1	*Language Learning Chatbots*	Chatbots like *Replika* or *Duolingo's chatbot* enable learners to practice conversational skills. By simulating real-life conversations, learners can engage in natural dialogue, receive immediate feedback, and improve their fluency without the pressure of real-time human interaction.
2	*Video Conferencing for Language Exchange*	Tools like *Zoom, Skype*, or *Google Meet* allow language learners to engage in face-to-face language exchange sessions with tutors or language partners. This helps students improve both their speaking and listening skills in real-time, fostering an interactive and personalized learning environment.
3	*Online Courses and MOOCs*	Massive Open Online Courses (MOOCs) such as *Coursera*, *edX*, or *FutureLearn* offer foreign language courses designed by universities and language institutes. These courses often feature multimedia content, quizzes, and peer discussions, providing a rich and diverse language-learning experience
4	*Digital Immersion Platforms*	Platforms like *FluentU* or *Yabla* provide videos, music, and other authentic materials in the target language. By using real-life media, learners can improve listening comprehension and gain exposure to native speakers' language use, accents, and cultural nuances.

Gamification elements found in apps such as *Memrise* or *Quizlet* make learning more engaging and enjoyable. Learners are motivated by earning points, completing levels, and competing with others. This interactive approach helps maintain interest and encourages consistent practice, making language learning more enjoyable. Digital technologies provide learners with the flexibility to study anytime and anywhere. Mobile apps like *Busuu*, *Babbel*, and *Anki* allow students to learn on the go, making it easier for busy individuals, especially working professionals or students, to incorporate language learning into their daily routines. This accessibility also supports learners from diverse geographical locations who may not have access to traditional language courses [2].

Use Platforms like *FluentU, Yabla*, and *YouTube* allow learners to immerse themselves in authentic content, such as videos, podcasts, and conversations from native speakers. This exposure to real-world language use helps learners improve their comprehension, vocabulary, and understanding of cultural contexts that traditional classroom settings may lack. Digital technologies enable learners to receive immediate feedback, especially when practicing pronunciation or grammar through apps like *Rosetta Stone or Google Translate*. Real-time corrections help learners identify mistakes quickly and make necessary adjustments, improving their language skills efficiently. Many digital tools and platforms offer affordable or free options compared to traditional language learning methods, such as private tutors or formal language courses. This makes language learning more accessible to a broader range of learners, especially those on a budget [9].

However, an over-reliance on these technologies (*lack of human interaction, over-reliance on technology,limited exposure to complex grammar and cultural contexts, digital literacy barriers, loss of traditional language learning skills, quality and credibility of online content*) may hinder the development of deeper language skills such as cultural understanding, complex grammar usage, and meaningful human interaction [4]. There is also the risk of learners becoming dependent on quick answers from digital platforms, reducing their critical thinking and problem-solving abilities. Additionally, the potential digital literacy barriers and unequal access to technology may limit the benefits for all learners.

Conclusion. In the modern era, the development of foreign language competence in future specialists is a critical factor in their professional success. The integration of modern digital technologies into educational practices provides an innovative and effective approach to enhancing language skills. Through interactive platforms, online courses, virtual communication, and artificial intelligence tools, students can engage in immersive, self-directed, and personalized learning experiences [10]. These technologies not only facilitate language acquisition but also foster greater cultural awareness, adaptability, and practical communication skills that are essential for the globalized workforce. Furthermore, they provide opportunities for continuous learning and real-time feedback, promoting a more dynamic and flexible learning environment.

However, the successful implementation of these technologies requires careful planning, adequate training for both educators and students, and a balanced approach to traditional and digital methods. The role of educators in guiding students through this technological landscape is paramount, ensuring that digital tools are effectively aligned with the learning objectives and the overall educational goals.

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