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INNOVATIVE TECHNOLOGIES IN TEACHING MARITIME ENGLISH: VIRTUAL REALITY AND GAMIFICATION

The article examines innovative technologies in teaching Maritime English, specifically virtual reality and gamification. This study is relevant because the need to integrate the latest technologies into the learning process enhances the effectiveness of language acquisition and improves student motivation. The article's main aim is to explore the potential application of VR and gamification in creating realistic learning environments and increasing students' interest in specialized language learning. Existing scientific works related to this topic are analyzed, and recommendations for integrating these technologies into the educational process in maritime universities are provided. It was stated that the possibilities of VR technologies within the gamification framework in maritime education are limitless. The involvement of immersive (creating a sense of presence and immersion) digitalization technologies is set to reconstruct the opportunities for practical training of future professionals within the walls of educational institutions. These opportunities primarily include the transition from theory to practice, emphasizing visualizing the process, communication tools, and implementing actions. It was described that the involvement of VR technologies in Maritime English contains functions that are impossible in real life on other simulators. The article also discusses the psychological aspects of applying these technologies, noting that VR and gamification foster an engaging learning environment and help reduce anxiety, improve confidence, and encourage students to actively participate in language learning. It was stated that using VR reduces students' stress levels and helps them remain calm in extreme situations, an essential aspect for maritime students and their readiness for practice. Gamification creates a positive learning atmosphere, which helps develop students' confidence. Additionally, the research highlights the challenges faced in integrating these technologies into existing curricula and suggests solutions for overcoming technical and pedagogical barriers. Furthermore, the potential for continuous improvement through future technological advancements is discussed. The study concludes that virtual reality offers the closest approximation to real maritime conditions, while gamification helps increase student motivation for learning. Conclusions highlight the need for further research and development in applying innovative technologies to Maritime English teaching.

Key words: virtual reality, gamification, Maritime English, teaching technologies, student motivation, technology integration, simulations.

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ІННОВАЦІЙНІ ТЕХНОЛОГІЇ У ВИКЛАДАННІ МОРСЬКОЇ АНГЛІЙСЬКОЇ МОВИ: ВІРТУАЛЬНА РЕАЛЬНІСТЬ ТА ГЕЙМІФІКАЦІЯ

У статті розглянуто використання інноваційних технологій, зокрема віртуальної реальності та гейміфікації, у викладанні морської англійської мови. Актуальність дослідження зумовлена необхідністю інтеграції новітніх технологій у процес навчання для підвищення ефективності засвоєння мови та покращення мотивації студентів. Основна мета статті полягає у вивченні можливостей застосування VR та гейміфікації для створення реалістичних навчальних середовищ і підвищення інтересу студентів до вивчення спеціалізованої мови. Проаналізовано існуючі наукові роботи, що стосуються цього питання, та надано рекомендації щодо впровадження технологій у навчальний процес морських вузів. Визначено, що віртуальна реальність забезпечує максимальну наближеність до реальних умов роботи моряків, а гейміфікація сприяє підвищенню мотивації студентів до навчання. Висвітлено, що можливості технологій віртуальної реальності в рамках гейміфікації в морській освіті є безмежними. Залучення іммерсивних (створення відчуття присутності та занурення) технологій цифровізації має на меті реконструювати можливості практичного навчання майбутніх фахівців в межах навчальних закладів. Ці можливості в першу чергу включають перехід від теорії до практики, з акцентом на візуалізацію процесу,

інструменти комунікації та реалізацію дій. Стаття також розглядає психологічні аспекти застосування цих технологій, зазначаючи, що віртуальна реальність та гейміфікація не лише сприяють створенню захоплюючого навчального середовища, але й допомагають знижувати рівень тривожності, покращувати впевненість і захочувати студентів активно брати участь у вивченні мови. Висвітлено, що використання технологій VR знижує рівень стресу у студентів та допомагає їм залишатися спокійними в екстремальних ситуаціях, що є важливим аспектом для моряків, а гейміфікація у свою чергу створює позитивну навчальну атмосферу, що сприяє розвитку впевненості студентів під час проходження морської практики. Крім того, дослідження підкреслює труднощі, з якими стикаються при інтеграції цих технологій в існуючі навчальні програми, та пропонує рішення для подолання технічних і педагогічних бар'єрів. Також обговорюється потенціал для постійного вдосконалення через майбутні технологічні досягнення. Висновки свідчать про необхідність подальших досліджень та розробок у галузі застосування інноваційних технологій у навчанні морської англійської.

Ключові слова: віртуальна реальність, гейміфікація, морська англійська мова, технології навчання, мотивація студентів, інтеграція технологій, симуляції.

Problem Statement. With the transition of maritime education from knowledge transmission to the formation of competencies, the role of methods and technologies that can activate cognitive activities of students, enhance their interest in Maritime English learning, and develop cognitive skills essential for effective intercultural communication is increasing. Virtual reality and gamification are a successor to traditional gaming technologies, expanding the functionality of actions and opening access to experiencing various communicative models within classroom sessions. The relevance of studying these technologies is confirmed by the number of works on the topic and their active use at all levels of education. However, the methodology for organizing the learning process remains underexplored.

Analysis of Researches. The theory and practice of teaching English using innovative technologies has been studied by several domestic scholars, including works by O. Vasyukovych, O. Ivanova, S. Kyrychenko, H. Ovsyanko, O. Melnyk, O. Ponomarenko, I. Akhmad, O. Semidy, L. Huryieva, K. Lisetsky. Among foreign works, the application of gamification and virtual reality technologies in learning foreign languages is confirmed by works by Bicen H., Herrington J., Herrington A., Mantei J., Olney I., and Ferry B., among others.

Recent studies show that virtual reality is a powerful tool for creating learning environments that simulate real-life situations. According to Clarin A., virtual reality can provide the most realistic environment for training maritime university students, allowing them to practice skills that cannot be recreated in a traditional classroom. Gamification, in turn, makes the learning process more interactive and engaging, which helps increase motivation to learn complex specialized vocabulary (Clarin, 2022: 33). This issue was explored by Balalle H. who noted that the addition of game elements, such as points and levels, significantly improves student engagement (Balalle, 2024).

Object. The purpose of the article is to study the potential of innovative technologies, such as virtual

reality and gamification, in teaching Maritime English and to describe their advantages in creating realistic learning situations and increasing student interest in the learning process.

Main Part. Virtual reality offers new learning opportunities. It allows students to simulate real-life working conditions on a ship, which is far more effective than studying theoretical materials. According to Seufert S. and Meier Ch. VR enables the creation of realistic situations for practicing language skills in emergencies or complex maneuvers at sea, enabling students to test their knowledge without real risks (Seufert, Meier, 2016: 28).

Gamification, in turn, adds an element of competition and interactivity, making learning more engaging. The authors Seufert S. and Meier, Ch., also studied this issue, noting that the use of gamification elements helps students maintain interest in learning and motivates them to achieve better results in learning specialized language (Seufert, Meier, 2016: 30).

In the comprehensive study of the phenomenon of gamification in education, Selwyn N. synthesizes the ideas of various researchers and defines gamification as the use of gaming techniques, game mechanics, and game elements in non-game situations to improve students' mastery of learning material through the application of a gaming context with the involvement of modern digital technologies (Selwyn, 2016).

Considering that the digitalization of education is a condition for its development, this definition is considered logical and well-founded. One of the factors that makes foreign language education a leader in testing and integrating the latest approaches is information independence, as specialists in this field are among the first to have the opportunity to study the experience of foreign scholars and practitioners.

Innovative approaches to language training for students should address the following tasks: developing students' communicative competence; developing general professional competence in the context of their future professional activity; and developing socio-cultural competence in the context of the social

and cultural adaptation of foreigners to new living and learning conditions in Ukraine and the national education system.

From our experience, some of the courses we need to integrate into the virtual reality of the learning process. For example, in our Maritime Academy, we use Cambridge University Press to offer the course Cambridge English for Engineering, which is specifically designed for students in technical fields. It includes textbooks, audio and video materials, and interactive exercises for learning technical vocabulary. Duolingo offers a specialized course, Engineering English, which focuses on developing vocabulary and communication skills in a technical environment.

English Class 101 provides video lessons on vocabulary for various technical topics. These lessons offer definitions of terms, examples of their use, and exercises to automate students' use of new terms and help them develop an active professional vocabulary. The Science & Technology section on BBC Learning English contains various materials, including videos, audio, and articles, which help expand the technical vocabulary. On the Quizlet platform, you can find sets of flashcards for learning technical vocabulary. At the same time, Memrise offers the Engineering Vocabulary course, which allows students to learn technical vocabulary through exercises and repetition.

The use of interactive exercises and games in learning English in technical universities can significantly improve the quality of education and make the learning process more engaging and effective. Students can take on roles in different scenarios related to their future profession, which allows them to use technical vocabulary in practical situations and develop their communication skills.

Creating tasks such as filling in the blanks, solving crosswords, or playing word association games with technical vocabulary helps master new terms and words. By playing games that develop speaking skills, such as during debates, discussions, or presentations, students learn to express their ideas and argue them using technical terminology.

Considering the technical nature of the specialization and the specifics of learning Maritime English, interactive exercises should be specialized and focused on improving communication skills according to technical requirements. These include creating technical presentations, using virtual laboratories, conducting technical debates, working on team projects, and participating in technical quizzes and games.

The possibility of watching video lectures multiple times contributes to a better understanding of complex topics and improves overall comprehension of the material. Global access allows learning to be

done anywhere and anytime. For example, YouTube has numerous channels for technical specialties. Among them, we highlight EngVid, which contains many video lessons in English, including specialized lessons for technical fields. Business English Pod focuses on learning business English. IELTS Liz offers practical video lessons and materials for international exams. Coursera and Prometheus offer online English courses for technical specialties, which include video lectures and practical assignments. Like Coursera and Prometheus, the edX platform offers courses from leading universities and organizations, including video materials for learning English in technical fields. TED Talks add informative presentations by experts in various fields, including technical topics, while Khan Academy offers video lessons and materials on multiple subjects, including technical sciences.

Pintrich P.'s research shows that virtual reality and gamification positively affect students' psychological state. According to a study, VR reduces students' stress levels and helps them remain calm in extreme situations, which is an important aspect for sailors. Gamification creates a positive learning atmosphere, which helps develop students' confidence (Pintrich, 2003: 668).

The analysis of methodological literature shows that the components of organizing the learning process using gamification technology include psychological age, professional, sociocultural, didactic, and technical aspects. Therefore, it is necessary to consider students' psychological age characteristics when organizing the learning process using gamification technology (Cullinan, 2021).

The opinion that we consider justified is that the closer students are to completing their studies, the less they need the application of gamification technology, as they are more interested in the practical aspects of learning the subjects, specific methods, and ways of using knowledge that they can apply in their work. Gamification during the education of graduating students can even be irritating, as they feel that they are wasting time on something unnecessary that will not be useful in their professional practice.

In the research of Kennedy G., Dalgarno B., Bennett S., Gray K., Waycott J., Judd T., emphasis is placed on the need to adhere to the principle of content conformity of gamification technology to the cognitive characteristics of students, the tasks, and the goals of the subjects being studied. Researchers concluded that using this technology would be more appropriate during the study of humanities disciplines, as well as subjects related to creativity and art. This article explores how augmented reality and virtual reality are transforming maritime education by creating an enhanced

learning environment, improving safety, providing cost-effective training solutions, and enabling remote learning and collaboration. It also examines various technologies that enhance the VR experience, such as haptic gloves, suits, VR treadmills, eye tracking, motion capture systems, brain-computer interfaces, and spatial audio. (Kennedy, 2009).

Using virtual reality in English language learning opens up new opportunities for students to immerse themselves in a linguistic environment and study the language in real situations. The application of interactive virtual tasks, where students need to use technical vocabulary to solve tasks or situations, helps them practically apply the language and learn it in real-world scenarios (Szabó, Kopinska, 2023).

Using language assistants and chatbots in the virtual environment allows one to practice English, receive feedback, and correct grammatical errors. Applying VR for collaborative technical projects in virtual space allows students to communicate, discuss, and develop technical English while working on group tasks.

In the modern educational environment, the role of artificial intelligence in teaching English in technical higher education institutions is becoming increasingly significant due to the introduction of innovative approaches. Artificial language assistants, such as ChatGPT and Grammarly, provide an interactive approach to learning English. Artificial intelligence systems can analyze students' progress and offer personalized learning programs, considering their individual needs and level of proficiency in English. Automated correction tools, such as Grammarly and DeepL Write, help students correct grammatical and stylistic errors, making the learning process more effective. Intelligent systems analyze students' pronunciation and provide feedback to improve their accent and pronunciation of technical terminology.

Mobile applications have already become an integral part of learning professional English in technical universities. Their contribution is to make the learning process more flexible and accessible for students.

The possibilities of VR technologies within the gamification framework in maritime education are limitless. The involvement of immersive (creating a sense of presence and immersion) digitalization technologies is set to reconstruct the opportunities for practical training of future professionals within the walls of educational institutions. These opportunities primarily include the transition from theory to practice, emphasizing visualizing the process, communication tools, and implementing actions. Moreover, the involvement of VR technologies contains functions that are not possible in real life on other simulators:

- Analytical: Mirror reflection of each action on the screen, with the possibility of further error analysis.
- Cognitive: Accompaniment of actions with the ability to choose and self-learn.
- Evaluation: Control of actions in each scenario with a hint mode.
- Communicative: Development of teamwork skills.

Conclusions. Analyzing the research results, we conclude that the modern methodology of foreign language education is adapting traditional technologies to the conditions of the educational model's digitalization. Traditional gaming technologies, the effectiveness of which has been confirmed by research in foreign language education, are undergoing a process of modernization.

One outcome of this has been the emergence of gamification technology, which has preserved the gaming principle of learning but expanded the methodological and didactic foundations of organizing and interacting with participants in the educational process.

It has been established that, in addition to increasing motivation in foreign language classes, this technology performs a therapeutic function, as it is organized according to the principles of interactivity and individualization of the learning process. It reduces students' anxiety while developing foreign language communication competence and helps overcome psychological barriers.

Gamification technology is an extremely flexible tool that takes into account students' age, cognitive, and social characteristics. The main task of the teacher in this process is to balance gaming elements and educational goals, adapt tasks to students' individual needs, and create a comfortable, motivating environment for language acquisition. This will also create a dynamic, engaging, and practice-oriented educational process.

We consider the prospects for scientific research to include the development of criteria for selecting interactive online platforms for teaching different categories of students, and the study of norms for using gamification technology in relation to other technologies, to avoid gaming overload and maintain the relevance of the educational goal.

Virtual reality and gamification are potent tools for enhancing the process of teaching Maritime English. They not only create realistic conditions for practicing the language but also help increase student motivation. However, to achieve the maximum results, it is necessary to continue researching and developing interactive technologies that will improve the quality of learning and prepare students for practical activities in the maritime field.

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