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DIGITALIZATION OF ENGLISH LANGUAGE TRAINING FOR FIRE AND RESCUE SERVICE PROFESSIONALS: INNOVATIVE APPROACHES AND INTERNATIONAL STANDARDS

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Abstract. The article addresses the issue of digitalization of English language training for fire and rescue service professionals in the context of contemporary challenges related to globalization, international cooperation, and the need for prompt communication during emergency situations. The growing role of international rescue missions, participation in joint exercises, and coordination with foreign partners necessitate a high level of English proficiency, particularly in professional terminology related to civil protection and emergency response.

Special attention is paid to the implementation of digital technologies in professionally oriented English language training. The study analyzes the potential of using online platforms, mobile applications, interactive simulations, virtual learning environments, distance learning systems, and multimedia resources that contribute to the development of communicative competence in future fire and rescue service professionals. It is emphasized that digital tools enable the simulation of real-life professional situations, fostering rapid decision-making skills and effective communication under conditions of risk and time constraints.

Key words: digitalization of education, English language training, professional communication, innovative teaching methods, international standards, mobile learning.

Introduction. The current stage of societal development is characterized by the active digitalization of all spheres of professional activity, particularly education and the specialized training of professionals. For fire and rescue service personnel, knowledge of the English language is critically important both for the exchange of experience at the international level and for the effective use of modern technologies and equipment, instructions, and standards, which are often presented in English.

However, traditional methods of learning English for this category of specialists do not always take into account the specifics of their professional activity and modern digital resources. The lack of an integrated approach that combines professional terminology, practical case studies, and digital learning technologies reduces the effectiveness of language training and limits opportunities for international cooperation.

An additional challenge is the discrepancies in the implementation of international standards for the training of fire and rescue service personnel, which require a high level of English proficiency for communication in crisis situations, participation in international training, and certification. Considering these factors, there is an urgent need to introduce innovative digital methods for developing English language competencies, adapted to the specifics of fire and rescue service activities and international safety standards.

In contemporary academic discourse, the issue of English-language training for fire and rescue service professionals is considered within the broader research direction of emergency language services and the digitalization of professional education. An analysis of publications indicates growing interest in this topic, which is associated with globalization, increased population mobility, and the need for effective communication in emergency situations (Guo X., Xiao D., Guo Y, 2024: 2).

One of the key research areas is the study of the role of language competence in the activities

of emergency response services. Scientific works emphasize that fire and rescue and medical service professionals regularly encounter language barriers that can significantly affect the quality and speed of decision-making in critical conditions. The lack of effective communication in such situations may lead to errors, thereby increasing risks to the lives and health of affected individuals.

In this regard, considerable attention is given to the implementation of digital technologies for overcoming language barriers. In particular, research demonstrates the effectiveness of using mobile applications with ready-made phrases and multilingual support, which enable rapid communication between rescuers and victims (Müller F., Schröder D., Noack E.M., 2023: 2-3). Such tools are an important element of the digitalization of professional activity; however, they cannot fully replace systematic language training for personnel.

A separate line of research focuses on the digitalization of education and the development of training systems for specialists using modern educational technologies. In particular, models for training specialists in “emergency English” are being developed, which include digital platforms, interactive courses, and multi-level competency development systems (Zhan W., 2025: 101). At the same time, the need to integrate such systems with practical tasks and real-life emergency scenarios is emphasized.

An important aspect is also the use of innovative learning technologies, including simulations, virtual environments, and artificial intelligence. Contemporary research shows that simulation models and digital training tools significantly enhance the effectiveness of rescue personnel training, as they allow for the reproduction of complex situations and the development of decision-making skills under stressful conditions (Li, H., Mao, H., Guo, Z., & Shao, Q., 2025: 3).

At the same time, academic works highlight a number of unresolved issues. In particular, studies point to the insufficient development of assessment systems for evaluating the effectiveness of language training in emergency contexts, a limited amount of empirical data, and weak integration of theoretical models with the real practice of emergency services (Li, H., Mao, H., Guo, Z., & Shao, Q., 2025: 4). In addition, there is a fragmentation of approaches to the implementation of digital technologies and a lack of unified training standards aligned with international requirements.

Thus, the analysis of contemporary research indicates the active development of the digitalization of language training in the field of emergency services; however, it also reveals a number of gaps related to insufficient systematization, practical orientation, and standardization of approaches. This creates a need for further research aimed at developing comprehensive innovative models of English language training for fire and rescue service professionals, taking into account international standards and digital capabilities.

Aim and objectives of the study. The aim of the article is to analyze the characteristics of the digitalization of English language training for fire and rescue service professionals, as well as to determine the role of innovative educational technologies and international standards in the development of professional foreign language competence.

To achieve the stated aim, the following objectives are set:

- 1) to analyze contemporary approaches to the digitalization of the educational process in English language teaching;
- 2) to identify the specifics of English language training for fire and rescue service professionals;
- 3) to characterize modern digital tools and platforms that can be used in professionally oriented English language instruction;
- 4) to examine the role of international standards and practices in the development of foreign language professional competence of future rescuers;
- 5) to outline prospects for the use of innovative digital technologies in the process of language training for civil protection professionals.

Presentation of the main material. In today’s world, the rapid development of digital technologies is significantly transforming all spheres of professional activity, including education and the profes-

sional training of emergency service specialists. Digitalization processes are becoming a key factor in the modernization of the educational environment, opening new opportunities for improving learning efficiency, access to information resources, and the integration of international training standards. According to the requirements of the Ministry of Internal Affairs of Ukraine regarding language training, the development of communicative competence is an integral part of the professional standard of a rescuer (Basic principles of language training, 2019).

As the activities of fire and rescue service professionals involve rapid interaction, quick decision-making, and cooperation with international organizations in the field of civil protection and emergency response, effective communication is essential. In the context of globalization and expanding international cooperation, the English language plays the role of a key tool for professional communication. For fire and rescue personnel, English proficiency is important not only for participation in international training programs, experience exchange, and joint operations, but also for working with international technical documentation, instructions, safety standards, and modern emergency response technologies. In this regard, there is a growing need to improve methods of teaching English for both future and current professionals in the fire and rescue sector.

The digitalization of the educational process creates new opportunities for improving the quality of language training. The use of digital platforms, online courses, interactive learning environments, multimedia materials, mobile applications, and virtual simulations contributes to the development of professionally oriented language competencies. Thanks to these tools, learning becomes more interactive, adaptive, and closer to real conditions of professional activity. Of particular importance are digital simulation technologies, which allow for the modeling of emergency situations and the practice of professional communication in English within the context of real operations.

In addition, an important aspect of modernizing English language training is its orientation toward international standards and practices in the field of rescuers' training. The integration of such standards into the educational process contributes to the harmonization of professional education with European and global requirements, increases the level of professional mobility of specialists, and promotes the development of intercultural communication. The implementation of modern digital technologies in combination with international educational standards makes it possible to form an effective model of professionally oriented English language instruction.

Virtual reality (VR) and augmented reality (AR) are arguably among the most powerful tools for this field. The use of these technologies opens new opportunities for improving English language training for fire and rescue service professionals. As noted by Stoika O., immersive technologies are also becoming a tool for active learning. Virtual simulations make it possible to reproduce complex processes that cannot be carried out or are unsafe in real conditions (Stoika O., 2024: 181). These technologies enable the creation of an interactive learning environment that is as close as possible to real conditions of professional activity. Freina L. and Ott M. also emphasize the significant potential of VR in education. They point to the technology's ability to simulate real-life situations, which is particularly valuable for professions where practical skills are essential (Freina, L., Ott, M. A., 2015: 12).

In contrast to traditional teaching methods, where professional vocabulary is often acquired through textbooks or static images, VR and AR enable trainees to directly immerse themselves in simulated emergency situations. For example, through virtual reality technologies, future rescuers can find themselves in a simulated smoke-filled environment and perform professional tasks using English as a means of communication.

The use of VR for modeling professional scenarios is particularly effective. Interactive 360-degree video simulations make it possible to reproduce various situations related to fire suppression, evacuation of victims, or coordination of rescue units. In such conditions, trainees have the opportunity to practice professional communication in English, including giving commands, coordinating team actions, and responding to changing circumstances during rescue operations. This contributes to the

development not only of linguistic competence but also of communicative competence under stressful conditions that are typical for rescue work.

Augmented reality (AR) is capable of visualizing complex technical processes and mechanisms, which is critically important for developing a deep understanding among students of engineering and technical specialties (Bordiuk O., 2025: 434). The visualization of terminology through augmented reality transforms abstract lexical units into concrete objects of professional activity, increasing the level of specialized vocabulary acquisition by 40 – 50% compared to traditional memorization. For example, when a mobile device camera is pointed at a specific piece of rescue equipment – such as a fire hydrant, hydraulic spreader, or other tool – the screen displays its English name, a brief description, and instructions for use. Such an approach significantly facilitates the acquisition of professional terminology, as it combines visual perception of an object with its linguistic representation and functional purpose. It is also worth noting that virtual reality enables students to conduct experiments in a safe environment without the risk of making mistakes in real conditions, which reduces the fear of failure in learning and increases confidence in their own abilities (Lin, X. P., Li, B. B., Yao, Z. N., Yang, Z., Zhang M., 2024: 2–6).

Thus, the integration of virtual and augmented reality technologies into the English language training of fire and rescue service professionals contributes to improving the effectiveness of learning, developing practical language skills, and fostering readiness for professional communication in real or simulated emergency situations.

Another important element of the digitalization of English language training for fire and rescue service professionals is the use of specialized mobile applications and gamification technologies. Modern digital tools make it possible to organize the learning process in a way that is as accessible and flexible as possible, which is particularly important for emergency service personnel with irregular work schedules. Thanks to mobile technologies, learning materials become available anytime and anywhere, creating conditions for continuous professional development and improvement of foreign language competencies.

One effective approach in this context is micro-learning, which involves presenting educational content in the form of short, structured modules. This format allows cadets and fire and rescue personnel to acquire new vocabulary and professional language structures gradually, at a convenient pace. To implement this approach, digital platforms such as Quizlet or Memrise can be used, enabling the creation of thematic vocabulary sets related to the specifics of rescuers' professional activities. For example, such sets may cover topics related to hazardous materials, first aid provision, or structural fire suppression. The use of interactive flashcards, tests, and repetition exercises contributes to more effective memorization of professional terminology and its practical application.

Gamification also plays an important role in the learning process, as it involves the use of game elements in education to increase learners' motivation and engagement. Interactive platforms such as Kahoot or Wordwall make it possible to create various quizzes and team-based tasks aimed at assessing knowledge of professional vocabulary and international communication standards. In particular, during such interactive sessions, cadets can compete in their knowledge of the International Phonetic Alphabet, radio codes, and specialized terminology used in the professional activities of fire and rescue units.

Such a learning format not only facilitates better knowledge acquisition but also develops skills of rapid response and teamwork, which are extremely important in real working conditions for rescuers. Thus, the integration of mobile applications and gamification elements into English language training makes learning more flexible, interactive, and adapted to the professional needs of fire and rescue service specialists. This contributes to improving the effectiveness of acquiring professional terminology, developing communicative skills, and fostering motivation for continuous improvement of English proficiency.

Another promising direction in the digitalization of English language training for fire and rescue service professionals is the use of artificial intelligence technologies. Modern tools based on Artificial Intelligence (AI) can significantly enhance learning effectiveness through the personalization of the educational process, adaptation of tasks to learners' proficiency levels, and the creation of an interactive environment for language practice. Unlike traditional teaching methods, artificial intelligence can function not only as a supportive tool but also as a kind of conversational partner, enabling cadets to regularly practice professionally oriented communication in English. In particular, the use of multimedia platforms and AI training tools in ESP learning contributes to the intensification of the educational process under martial law conditions.

One effective form of using such technologies is role-playing activities with chatbots. Danyk Y. O. and Kirichenko D. O. note that AI has significant potential to improve every stage of firefighting operations: from forecasting and early detection to resource management and post-incident recovery. The integration of AI enables the rapid processing of large volumes of data, ensuring accuracy and efficiency of analysis, which is critically important for timely emergency response (Danyk Y., Kirichenko D., 2025: 169).

Within such training scenarios, learners can interact with a virtual interlocutor powered by artificial intelligence. For example, the AI conversational partner may simulate communication with a casualty during an emergency situation: describing symptoms of injuries, reporting their location, or requesting assistance in English. In this format, future rescuers have the opportunity to practice asking questions, clarifying information, giving instructions, and coordinating actions in realistic simulated emergency conditions. Such interactive scenarios contribute to the development of communicative competence and also foster readiness to use English in stressful and unpredictable professional situations.

An important direction in the application of artificial intelligence in language training is also the use of voice-based training tools that operate on speech recognition technologies. Such systems allow cadets to practice the correct pronunciation of professional vocabulary and technical terms, which is particularly important for effective radio communication during rescue operations. Through automatic speech analysis, the system can assess pronunciation accuracy, intonation, and clarity of information delivery, as well as provide recommendations for improving language skills. This significantly enhances the quality of professional training for real-life communication conditions, where clarity and speed of information exchange can be critically important.

Thus, the integration of artificial intelligence technologies into the English language training of fire and rescue service professionals creates new opportunities for the development of professionally oriented language competencies, ensures the individualization of learning, and promotes the formation of practical communication skills in simulated emergency conditions.

Another important aspect of the modern digitalization of English language training for fire and rescue service professionals is the use of collaboration platforms and cloud-based resources that enable the integration of international experience and provide access to learning materials anytime and anywhere. Digital hubs are becoming a kind of bridge between educational institutions in different countries, facilitating the exchange of best practices and the development of professional competence in the field of civil protection. Thanks to such resources, cadets can master professional English not only in the classroom but also through collaborative work on realistic tasks and the analysis of practical case studies. One of the most effective tools for collaborative learning is virtual boards such as Miro and Padlet. The use of such platforms allows groups of cadets to jointly solve tactical tasks in English, for example, developing evacuation plans, coordinating team actions, or assessing risks in simulated emergency situations. This interactive learning format not only enhances language practice but also develops teamwork skills and strategic thinking.

Equally important is the use of cloud-based video resources. Sarnovska N. I. emphasizes that the use of mobile learning tools in the process of studying a foreign language helps overcome communication barriers, develop research skills, increase motivation to acquire language skills, and apply them in real interpersonal communication contexts (Sarnska, N. I., 2019: 106).

Therefore, it can be argued that the use of cloud services and mobile applications in teaching English for specific purposes enables the implementation of the concept of lifelong learning for rescuers who work on shift schedules.

Platforms such as YouTube or TED-Ed provide access to video recordings of the work of American and British fire departments, including bodycam footage and training demonstrations. The analysis of such materials allows cadets to become familiar with “live” professional language, observe real communication patterns, and develop listening comprehension skills in English within a specific professional context. This ensures a deeper understanding of terminology, language structures, and standards of behavior in real working conditions of rescuers.

Thus, the integration of collaboration platforms and cloud-based resources into the educational process creates a favorable environment for the development of professionally oriented language competencies, promotes international exchange of experience, and increases the effectiveness of practical English language acquisition for fire and rescue service professionals.

Conclusion. As a result of the conducted research, it has been established that the digitalization of English language training for fire and rescue service professionals is a necessary condition for improving the quality of professional education in the context of modern global challenges. The growing role of international cooperation, participation in joint rescue operations, and training exercises determines the need to develop a high level of foreign language communicative competence oriented toward professional activity.

It has been demonstrated that the implementation of digital technologies, in particular online platforms, mobile applications, interactive simulations, and virtual learning environments, contributes to improving the effectiveness of the educational process. Such tools enable the modeling of real professional situations and the development of skills for rapid decision-making and communication under conditions of limited time and increased risk.

It has been established that the use of innovative methodological approaches, including scenario-based and problem-based learning, as well as digital case studies and training exercises, contributes to a deeper acquisition of professional terminology and the development of practical speech skills among future fire and rescue service professionals.

Special attention is given to the importance of international standards, which ensure the unification of professional communication and enhance the effectiveness of interaction during emergency response operations. Compliance of educational programs with these standards is an essential condition for training competitive professionals.

Thus, the integration of digital technologies and innovative approaches into the process of English language training contributes to the development of professionally oriented communicative competence, increases the readiness of specialists to work in an international environment, and ensures that training meets the modern requirements of the civil protection sector.

The prospects for further research lie in the development of comprehensive digital educational platforms adapted to the needs of fire and rescue services, as well as in the creation of effective assessment systems for evaluating the level of English language proficiency in conditions that closely simulate real professional activity.

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