

4.5. THE USE OF ARTIFICIAL INTELLIGENCE IN EDUCATION AS AN EFFECTIVE TOOL FOR DEVELOPING FOREIGN LANGUAGE COMMUNICATIVE COMPETENCY

Innovation and progress, as well as other innovations, have led to the development of artificial intelligence, which has found its way into various sectors of society and is having a significant impact on the various industries within which it is used. One of the areas where artificial intelligence (AI) is used and has a significant impact is education. Over the past few decades, technology has completely changed the world around us. The use of AI in education is extremely promising, as it opens up new opportunities, potentials and challenges in educational practices. This includes improving the learning process, supporting teachers, and providing a more effective individualised approach. AI has influenced not only teaching and learning, but also the administration and management of education, i.e. the leaders of educational institutions and the education sector.

In recent years, many studies have focused on the disadvantages and advantages of using AI. Valuable research ideas have been shared by Fang Ouyang and Pengcheng Jiao, who have described three paradigms of artificial intelligence in education. The first one includes the representation of knowledge models, i.e. various means of demonstrating them. This is a stage in the development of cognitive learning. The second paradigm is knowledge support in cooperation with AI. The third paradigm involves expanding learning opportunities and the transition to initiative and the development of independent work (Fang Ouyang and Pengcheng Jiao, 2019). AI generally encompasses the development of computer systems capable of performing human functions, including cognitive, learning, decision-making, and environmental adaptation (Chen L., Chen P., & Lin Z., 2020). One of the potential roles of AI in education is to provide opportunities for the development of human intelligence, with AI supporting decision-making processes rather than replacing us through automation. To provide empirical evidence to support this argument, researchers M. Cukurova, C. Kent, and R. Luckin (Cukurova M., Kent C. and Luckin R., 2019), presented a case study in the context of debate training that uses prediction and classification models to increase the transparency of expert tutors' intuitive decision-making processes for extended reflection and feedback. The results proved that multimodal data leads to more accurate classification models in the context under study. The analysis of the study indicates a focus on the effective use of information technology, in particular artificial intelligence, in the education sector.

Most of the works in the field of AI are considered in the form of thematic research (Chaudhry MA, Kazim E, 2021):

- Reducing the workload of teachers without affecting learning outcomes.
- Contextualised learning for learners: as each individual has unique learning needs, the goal of AI in education is to provide individualised and/or personalised learning experiences for learners based on their context and learning experiences.
- Assessment: this is not only about what they know, but also how they learn and what pedagogical methods are appropriate for them.
- Intelligent Tutoring Systems (ITS): The goal of AI in education is to create intelligent learning environments that can interact with learners, provide individualised feedback, and improve their understanding of specific topics.

The *purpose of* this publication is to analyse the possibility of using artificial intelligence as a means of developing the foreign language communicative competence of specialists in navigation and ship handling in the context of continuing education. The research questions are as follows:

1. Identify the potential benefits of using AI to develop foreign language communicative competence.
2. To offer examples of the use of AI in the process of teaching maritime English.
3. Identify tasks for further improving the use of AI as an effective educational tool.

The use of AI in the educational process of higher education institutions has potential advantages. In our study, we describe some practical aspects that have been implemented in the process of teaching maritime English at Kherson State Academy and have demonstrated high efficiency. To organise the educational process, we chose Moodle, a Content Management System (CMS) specially designed for creating online courses by teachers.

Practical aspects of AI application in the educational process for the purpose of forming foreign language communicative competence of specialists in navigation and ship handling in the context of continuing education include:

1 development of web-based learning resources;

A positive aspect of the use of AI in the process of forming foreign language communicative competence is the development and implementation of e-courses. The need to create such courses was due to various factors: military events in the country, the long coronavirus period. One of the important factors that challenged the need to create electronic resources was the long-term maritime practice of cadets. We also believe that the educational process, supported by effectively developed e-courses on appropriate platforms, will ensure continuity in education.

The online elements of the course were implemented using the Moodle learning management system, which offers online support for the learning process. It is a place to share knowledge and experience, providing flexible working hours and a variety of work styles. Courses developed for cadets can be used both in online learning and in additional self-study. The structure of such courses has a clear structure in accordance with all the requirements for organising and conducting practical classes. Each module consists of 10-12 blocks (lessons), which include banks of audio-visual materials, interactive maps, and training materials with tasks for practicing the training material. The structural element of the module is a language thesaurus, which is important for the development of foreign language communicative competence and is necessary for studying the course of maritime English. An important component is test tasks for self-testing of acquired knowledge, as well as tests that check professional skills at the final stage of the module.

Analysing the benefits of AI, it is important to highlight the following: receiving feedback on the quality of the course. This makes it possible to focus on specific information or concepts that student's lack, and helps the teacher to improve materials and technologies in a targeted manner.

2 transition to personalised learning;

AI provides new opportunities, potential, and challenges for educational innovation, such as the shift to personalised learning. Personalisation makes it possible to meet the needs of each group member, easily adapt to individual learning needs, and direct learning based on the strengths and weaknesses of each participant. Meaningful and immediate feedback from students is very valuable. Some users may feel insecure when faced with difficulties directly in the learning process, but thanks to AI, they are given the opportunity to make mistakes and, with feedback, work on improvement.

Thus, promoting learner engagement, empowerment and personalisation, enabling learners to reflect on their learning and providing information to AI systems on how they can adapt to this will lead to the iterative development of learner-centred learning.

3 developments of testing and diagnostic systems

The development of a standardised testing and diagnostic system used to assess students' learning problems ensures appropriate learning trajectories. In the context of our study, namely the development of a system for the formation of foreign language communicative competence of specialists in navigation and ship management in the context of continuing education, a testing and diagnostic system was developed and placed on the Moodle platform.

The test tasks were developed by Kherson State Academy lecturers for each training module and in accordance with the course and level of education. This allows us to diagnose the level of learning, or the complexity of a certain type of task, or vice versa. This analysis enables the teacher to either improve test tasks in accordance with the results, challenges or learning needs, or to make changes to the educational process. For example, in a few minutes, a teacher can make a thorough analysis of the test result (Fig. 1): which tasks have the most errors, how much time was spent on this type of activity, how many times it was necessary to complete it to improve the result. These and other diagnostic characteristics help to make the educational process effective.

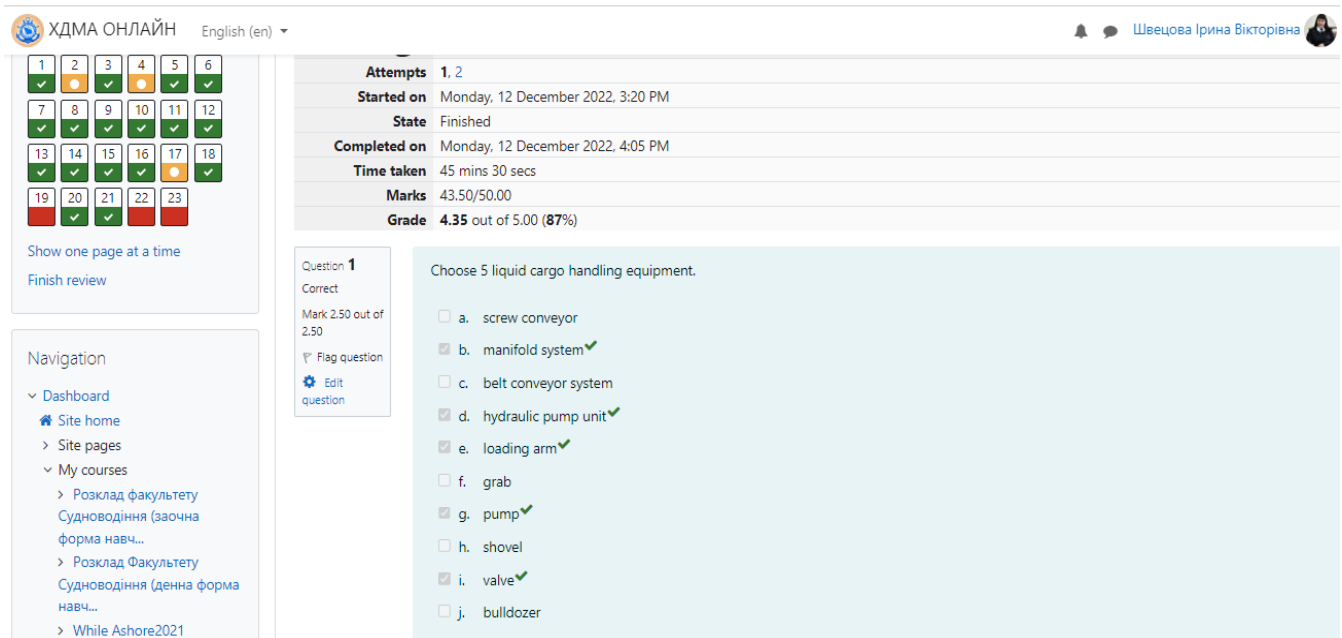


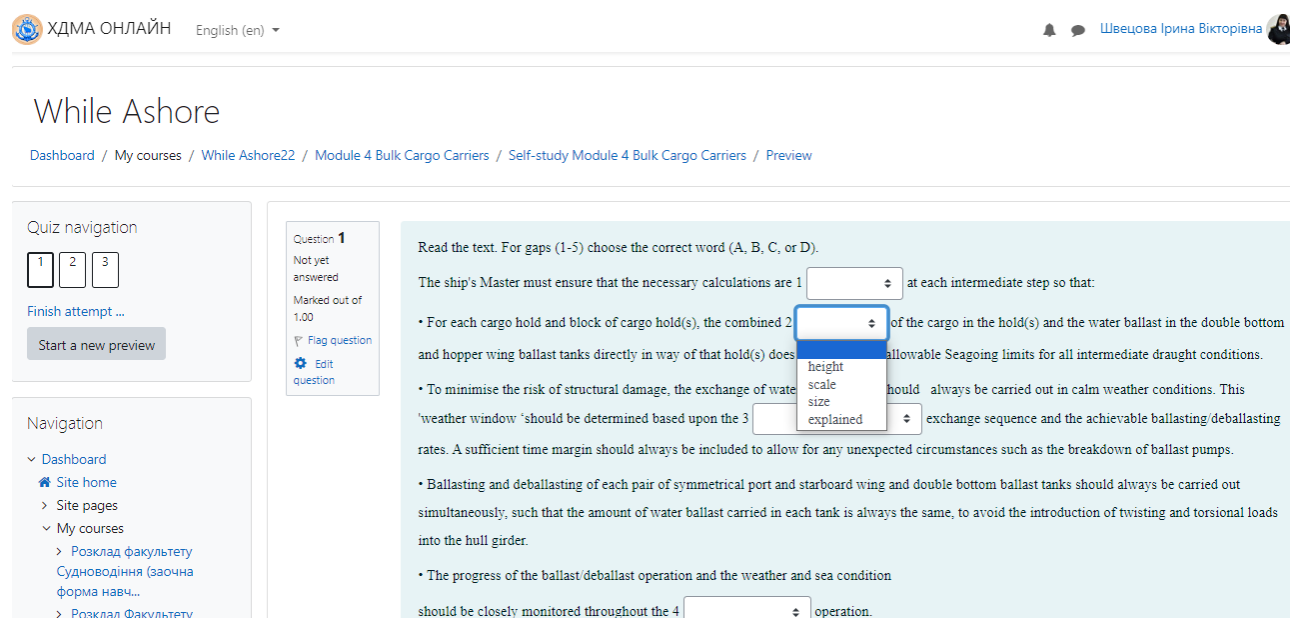
Fig. 1 Analysis of a task from the final Stop and Check test for the 1st year of the Maritime English course

The advantage of using the platform (AI) for a teacher in this case is the ability to assess the progress of students in a short period of time, analyse the effort by the number of attempts, and determine the time spent by students on certain tasks. In addition, AI helps to analyse exams by receiving data instantly, making the process convenient and time-efficient.

4 organising online education and using web platforms;

The application of AI in education makes it possible to overcome physical barriers related to borders at the national and international levels, as learning materials are now available on the Internet and the global network. Online education or the use of web-based learning platforms means that the material is accessible from anywhere in the world, as well as the use of other aspects of artificial intelligence, such as translation tools (Chen L., Chen P., & Lin Z., 2020). In the work of Kherson State Maritime Academy, and in e-learning, Moodle, a Learning Management Systems (LMS), is actively used. It is also called Virtual Learning Environments.

To ensure effective work with tasks posted on the platform and designed to work both online and offline, it is important to consider their functionality and type. The student should see their results immediately after completing the task or lesson. Timely analysis of their own achievements or timely work on mistakes will have positive results in the educational process. Below is an example of a task from the Maritime English course that allows you to read, complete and analyse the result (Fig. 2).



The screenshot shows a Moodle quiz interface. At the top, the user is logged in as 'Швецова Ірина Вікторівна'. The page title is 'While Ashore'. The breadcrumb trail is: Dashboard / My courses / While Ashore22 / Module 4 Bulk Cargo Carriers / Self-study Module 4 Bulk Cargo Carriers / Preview. On the left, there is a 'Quiz navigation' panel with three question indicators (1, 2, 3), a 'Finish attempt...' button, and a 'Start a new preview' button. Below that is a 'Navigation' panel with links to 'Dashboard', 'Site home', 'Site pages', 'My courses', and 'Розклад факультету'. The main content area shows 'Question 1' with a status of 'Not yet answered' and a score of 'Marked out of 1.00'. The question text is: 'Read the text. For gaps (1-5) choose the correct word (A, B, C, or D). The ship's Master must ensure that the necessary calculations are 1 [dropdown] at each intermediate step so that: • For each cargo hold and block of cargo hold(s), the combined 2 [dropdown] of the cargo in the hold(s) and the water ballast in the double bottom and hopper wing ballast tanks directly in way of that hold(s) does 3 [dropdown] allowable Seagoing limits for all intermediate draught conditions. • To minimise the risk of structural damage, the exchange of water 4 [dropdown] should always be carried out in calm weather conditions. This 'weather window' should be determined based upon the 5 [dropdown] exchange sequence and the achievable ballasting/deballasting rates. A sufficient time margin should always be included to allow for any unexpected circumstances such as the breakdown of ballast pumps. • Ballasting and deballasting of each pair of symmetrical port and starboard wing and double bottom ballast tanks should always be carried out simultaneously, such that the amount of water ballast carried in each tank is always the same, to avoid the introduction of twisting and torsional loads into the hull girder. • The progress of the ballast/deballast operation and the weather and sea condition should be closely monitored throughout the 6 [dropdown] operation.' A dropdown menu is open over the second gap, showing options: height, scale, size, explained.

Fig. 2 Example of a task from the course Maritime English

5 Using VR-TECH in practical maritime English classes

In our previous publications (Shvetsova I., 2021), we noted that the use of VR-TECH in English classes as a new technology and teaching tool creates a new learning environment that can help students: better perceive complex information and acquire new skills; process a lot of information and present it in an interactive way; demonstrate and apply theory during the class; understand how to use this knowledge in practice; encourage students to engage in the learning process.

The use of VR-TECH in practical classes was appropriate when practicing the relevant vocabulary of a module or topic and demonstrating the acquired professional competencies. This is an effective way to develop communication skills in combination with the formation of professional competence.

Common tasks that cadets performed included: checking equipment before proceeding to the next action (checking oxygen, communication, etc.); analysing different cases and making decisions in the

course of identifying them; filling out checklists; analysing information that needs to be considered when preparing equipment (e.g. Portable Gas Detector); discussing important steps to perform a particular activity; identifying possible problems when working in confined spaces and the procedures required to solve them.

Thus, AI provides students with hands-on or experiential learning experiences, especially when used in conjunction with other technologies such as virtual reality, 3-D, games, and simulations, thereby enhancing the learning experience of students (Chen, L., Chen, P., & Lin, Z., 2020). Artificial intelligence (AI) has the potential to address some of the biggest challenges in education today, and to innovate teaching and learning practices. However, rapid technological developments inevitably bring numerous risks and challenges that are currently outpacing policy discussions and regulatory frameworks. UNESCO is committed to supporting Member States in harnessing the potential of AI technologies to achieve the goals of Education 2030, while ensuring that their application in educational contexts is guided by the core principles of inclusiveness and equity. The principle of "AI for All" should mean that everyone can take advantage of the ongoing technological revolution and gain access to its products, including innovation and knowledge (UNESCO, 2019).

Among the general important tasks in the use of AI that should be taken into account in the educational process are the following:

- 1) to meet the needs of students;
- 2) to ensure a close connection between educational theory and practice;
- 3) to reduce the workload of teachers, focusing them more on organising interactive forms of interaction using AI than on technical ones (checking tasks).
- 4) to facilitate teachers' adaptation to change. Such retraining and professional development can be organised through various events (webinars, workshops) that will effectively contribute to methodological support.

AI-enabled education is currently seen as an early-stage education assistant, while AI-enabled education will play a more important role as learning requirements change.

So, the theoretical analysis of the study and practical experience made it possible to draw conclusions about the wide possibilities of using artificial intelligence as a means of forming foreign language communicative competence of specialists in navigation and ship management in the context of continuous education. The potential advantages of using AI to develop foreign language communicative competence are identified, including iterative interaction of process participants, focus on students, their needs, ability to research, solve problems and achieve learning goals, which has the potential to transform education.

AI provides a better learning experience as it enables modification and personalisation of learning materials according to the needs and abilities of users. Among the proposed examples of the use of AI in the educational process to develop the foreign language communicative competence of specialists in navigation and ship management in the context of continuing education, we have the following: development of web-based learning resources, transition to personalised learning; development of testing and diagnostic systems; organisation of online education and use of web platforms; use of VR-TECH in practical classes in maritime English.

The study identified the following tasks to further improve the use of AI as an effective educational tool: to meet the needs of students; to ensure a close connection between educational theory and practice; to reduce the workload of teachers by focusing more on organising interactive forms of interaction with the help of AI rather than on technical ones (checking tasks); to facilitate the adaptation of teachers to change.

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configurations are analyzed, which are used to solve a wide range of tasks (control, identification, forecasting, diagnostics, modeling of phenomena, classification, etc.) in different industries.

Keywords: automatic control system, decision support system, intelligent methods, fuzzy logic, artificial neural network, hybrid neuro-fuzzy network.

4.5. Iryna Shvetsova. The use of artificial intelligence in education as an effective tool for developing foreign language communicative competency.

The purpose of this publication is to analyse the possibility of using artificial intelligence as a means of developing the foreign language communicative competence of specialists in ship handling and ship management in the context of continuing education. The objectives of the paragraph are to identify the potential benefits of using AI for the development of foreign language communicative competence; to provide examples of the use of AI in the process of teaching Maritime English; to identify tasks for further improving the use of AI as an effective educational tool. Among the proposed examples of AI application in the educational process for the development of foreign language communicative competence of navigation and ship handling specialists were the following: development of web-based learning resources, transition to personalized learning; development of testing and diagnostic systems; organization of online education and use of web platforms; use of VR-TECH in practical classes in maritime English.

Keywords: artificial intelligence, foreign language communicative competence, active technologies of teaching English, maritime English.

4.6. Olha Kovalova, Tetiana Martynova-Hanetska. Artificial intelligence and neuro-training for children with developmental difficulties. When technology helps.

Innovative technologies such as artificial intelligence (AI), deep learning, machine learning and optogenetics are considered key components contributing to the acceleration of numerous discoveries in the life sciences, particularly in the field of neuroscience. Given the inherent development of artificial intelligence it is not surprising that "neuroscience", the comprehensive study of the nervous system, can benefit from the endless possibilities offered by AI through the augmentation of the human mind. Our mental capacity is impressive, but there is a limit to the amount of information we can mentally process. Along with advances in artificial intelligence systems, we can push neuroscience forward and unlock the mysteries of the human brain, one of the applications of which is the ability to identify neurological problems and detect neurotransmitters. The possibility of using AI to diagnose and treat neurological disorders is one of the most important prospects for neuroscience and AI development. Machine learning algorithms can be trained to recognize patterns in brain scans that may indicate the presence of diseases such as Alzheimer's, Parkinson's, or multiple sclerosis. This could lead to the detection of the disease at an early stage and the development of more effective treatment strategies, which would improve the quality of life for millions of people around the world. There is great promise in the detection and early neurocorrection of children with autism spectrum disorders. With the help of AI, certain deviations from the norm can be detected at an early stage and brought up for collegial discussion, and all possible measures can be taken to prevent the manifestations of this type of disorder from deepening.

Keywords: Artificial intelligence, neurodiagnostics, neurocorrection, machine learning, brain, EEG, rehabilitation.

4.7. Jevgenija Nevedomsjka. Advantages and dangers of artificial intelligence in medicine.

Artificial intelligence has rapidly entered the life of humanity as a whole, and of each person in particular. This is due to the fact that artificial intelligence and artificial neural networks are similar in the principles of information encoding and functioning to biological neural networks. Neural networks have absorbed the main features of a person – the ability to learn,