Oleksandra LITIKOVA,
orcid.org/0000-0001-7952-9895
Candidate of Pedagogical Sciences,
Associate Professor at the English Language Department for Marine Engineers
Kherson State Maritime Academy
(Kherson, Ukraine) aleksa.litik@gmail.com

OCEAN LEARNING PLATFORM (OLP) AS A TOOL FOR DEVELOPING HARD AND SOFT SKILLS OF MARINE ENGINEERS

This paper analyzes the potential of the Ocean Learning Platform (OLP) to support the integrated development of both hard and soft skills among future marine engineers. As the maritime industry faces increasing demands from technological change, environmental regulations and IMO compliance standards, marine engineers must be proficient in technical (hard) skills and interpersonal (soft) skills. The study emphasizes that Maritime English learning content must incorporate real-world materials, simulations, role-playing, virtual reality and task-based activities to effectively foster technical proficiency, communication, critical thinking, and teamwork. AI-powered tools, gamified modules, and multimodal resources further enhance personalized and effective learning. Crucially, these materials should align with IMO's Standard Marine Communication Phrases (SMCP), ensuring safety and regulatory compliance. Through a comparative analysis with other platforms (LearnMarine, sEaLearn4U, IMO e-Learning, Marlins, Seably), the paper highlights OLP's advantages in STCW-aligned training, soft skills and leadership development, and its strong integration of Maritime English. Been integrated with Moodle learning management system (LMS) for Marine English learning, the platform equips marine engineers with the hard and soft skills necessary to meet modern challenges, such as automation, environmental regulations, and digitalization. Methodological recommendations are provided to optimize OLP usage for comprehensive skill development, ensuring safe and effective performance at sea. The study provided in process of learning Maritime English to full-time and part-time cadets of marine engineering faculty confirmed that Ocean Learning Platform (OLP) effectively enhances the development of both hard and soft skills.

Key words: *Maritime English, OLP, hard skills, soft skills.*

Олександра ЛІТІКОВА,
orcid.org/0000-0001-7952-9895
кандидат педагогічних наук,
доцент кафедри англійської мови в судновій енергетиці
Херсонської державної морської академії
(Херсон, Україна) aleksa.litik@gmail.com

OCEAN LEARNING PLATFORM (OLP) ЯК ІНСТРУМЕНТ РОЗВИТКУ ТВЕРДИХ І М'ЯКИХ НАВИЧОК МОРСЬКИХ ІНЖЕНЕРІВ

У статті проаналізовано потенціал освітньої платформи Ocean Learning Platform (OLP) у підтримці інтегрованого розвитку як твердих (hard), так і м'яких (soft) навичок майбутніх морських інженерів. У контексті зростаючих викликів, зумовлених технологічними змінами, екологічними регламентами та стандартами відповідності Міжнародної морської організації (IMO), морські інженери повинні володіти як технічними, так і міжособистісними навичками. У дослідженні наголошується, що зміст курсу морської англійської має включати автентичні матеріали, симуляції, рольові ігри, віртуальну реальність і діяльність, орієнтовану на виконання завдань, аби ефективно розвивати технічну грамотність, комунікацію, критичне мислення та командну роботу. Інструменти на базі штучного інтелекту, гейміфіковані модулі та мультимодальні ресурси додатково сприяють персоналізованому й ефективному навчанню. Важливо, щоб ці матеріали відповідали Стандартним морським фразам IMO (SMCP), що гарантує безпеку та дотримання нормативних вимог. Порівняльний аналіз з іншими платформами (LearnMarine, sEaLearn4U, IMO e-Learning, Marlins, Seably) підкреслює переваги OLP у навчанні відповідно до вимог STCW, розвитку м'яких навичок і лідерських якостей, а також у глибокій інтеграції морської англійської. Завдяки інтеграції з системою управління навчанням Moodle для вивчення морської англійської, платформа забезпечує морських інженерів необхідними навичками для подолання сучасних викликів, таких як автоматизація, екологічні нормативи та цифровізація. У роботі також надано методичні рекомендації щодо оптимального використання OLP для комплексного розвитку навичок, що забезпечує безпечну та ефективну діяльність на морі. Дослідження, проведене в процесі вивчення морської англійської мови курсантами денної та заочної форми навчання факультету морської інженерії, підтвердило, що OLP ефективно сприяє розвитку як твердих, так і м'яких навичок.

Ключові слова: *морська англійська, OLP, тверді навички, м'які навички.*

Problem statement. Nowadays maritime sector operates in an environment that is not only technically demanding, but also deeply interconnected. Marine engineers are required to do more than just operate equipment – they must also communicate effectively, work well in a team, and make timely decisions under pressure. While soft skills such as teamwork and communication help ensure smooth operations, they are no substitute for the technical precision required to operate and repair complex onboard systems. Without a solid engineering foundation, safety and reliability on board ships at sea are at risk.

The ABS Quarterly Port State Control (PSC) report for the period January to March 2025 recorded 17 detentions of vessels by the US Coast Guard, mostly due to equipment failures, poor maintenance procedures, and inadequate fire drills. All this points to gaps not only in technical knowledge, but also in the coordination of the crew's actions.

Several major maritime events highlight this dual challenge. The grounding of the MV Wakashio in 2020 and the blockage of the Suez Canal by the Ever Given in 2021 exposed shortcomings in emergency preparedness and teamwork. In addition, the tragic fire on board the MV Maersk Honam in 2018 demonstrated how poor leadership and poor communication can exacerbate engine room crises.

One effective way to align academic learning with real-world expectations is through continuous on-the-job training (OJT), especially when delivered through offline gateway (OTG) e-learning tools. OTG e-learning systems allow marine engineers to access important training content on ships even without an internet connection, reinforcing both practical and theoretical knowledge in a flexible format. Popular e-learning systems among marine engineers include Engine Resource Management (ERM), Planned Maintenance System (PMS) training, Engine Room Emergency Management (EREM) and Ocean Learning Platform (OLP).

This study examines the OLP e-learning system, implemented as part of the bachelor's degree Training Program and integrated into the Moodle Learning Management System (LMS) of the Kherson State Maritime Academy. Currently, this higher education institution is relocated due to Russian military aggression against Ukraine and the training of maritime cadets of the Faculty of Marine Engineering is conducted in a blended format. In these conditions, the Moodle LMS platform is an ideal environment for providing feedback to full-time and part-time cadets who are studying or practicing on board a ship. OLP training courses, other digital tools integrated into the Moodle LMS platform make it effective for combining theoretical content with practical assessments and mechanisms for tracking students' progress. Thanks to this integration, marine engineering cadets can improve both hard and soft skills in real-world conditions on board a ship.

The objective of this paper is to review the maritime e-learning resources available through OLP, demonstrate how these tools support the integrated development of technical and soft skills, through the teaching of Maritime English, and propose methodological recommendations for the implementation of these tools in the education and training of marine engineers.

Research analysis. Since the specific topic of the Ocean Learning Platform (OLP) is relatively new and narrow, the broader field of maritime education and training (MET), especially regarding e-learning, simulation and the development of hard and soft skills in marine engineers, has been explored by several authors and researchers.

Some studies focus on the future of maritime education and training, and the prospects are seen in a combination of technical and soft skills (Água, Frias, Carrasqueira, Daniel, 2020). Others pursue maritime education reforms and simulator-based training focused on competency-based training, e-Learning and the integration of digital tools in MET (Kim, Sharma, Bustgaard, Gyldensten, Nymoen, Tusher, Nazir, 2021). Research on human factors, professional competencies, soft skills, gender, and leadership development in maritime education are also quite popular topics (Kitada & Pazaver, 2025). Some aspects on the improvement of the effectiveness of maritime simulation and training using platforms like OLP have been reported (Nosov, Dyagileva, Yurzhenko, Kulinic, Bosiiuk, 2023).

Currently, the Ocean Learning Platform (OLP) is a product of Ocean Technologies Group, a leading provider of maritime training and assessment solutions that leverages innovation in the shipping industry to improve maritime training and compliance. Journals such as TransNav, WMU Journal of Maritime Affairs, Maritime Policy & Management Journal and Journal of Marine Science and Engineering often publish newer studies on OLP, e-learning effectiveness, both hard and soft skill of marine engineers' development through virtual tools.

Comparing OLP to other digital platforms suitable for marine engineering training, OLP has the advantages that make it indispensable for integrating maritime English training with it. Most other e-learning and training solutions (LearnMarine, sEaLearn4U, IMO e-Learning, Marlins, Seably) are not fully offline platforms (OTG) like OLP. LearnMarine is

mainly online, sEaLearn4U is primarily online, IMO e-Learning and Seably are exclusively online, Marlins has some offline training capabilities (CD/DVD or USB), but they are limited. The only OLP (Ocean Learning Platform) suitable for marine engineering training supports OTG (Offline Training Gateway).

An analysis of e-learning materials focused on marine engineering on learning platforms shows a variety of approaches used. LearnMarine is well suited to complex topics, more tailored to officers. Marlins demonstrates strengths in language and soft skills development, but less technical depth. Seably outlines diverse and creative courses, but quality varies by provider. IMO e-Learning focuses on policy and regulatory requirements, but is not deeply technical. sEaLearn4U supports basic compliance training, although limited in academic depth. As for OLP, it is the most comprehensive, strong in technical systems, safety and IMO compliance.

A brief comparison focusing on the learning needs of marine engineers confirms that the best choices for marine engineers are the e-learning platforms OLP and LearnMarine. LearnMarine offers a wide range of features tailored to the needs of marine engineers, focusing on both technical proficiency and compliance with IMO standards (comprehensive course catalog, blended learning approach, customizable learning solutions, advanced technologies integration, focus on safety).

However, OLP integrates better with Maritime English learning due to the following undeniable advantages:

– built-in LMS functionality, allowing for seamless integration into existing learning systems such as Moodle LMS;

– offline learning gateway (OTG) that provides access to Maritime English content even on ships without stable internet, ensuring uninterrupted learning;

– automated tracking and compliance features via Moodle LMS that align Maritime English learning with the IMO Standard Marine Communication Phrases (SMCP), the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and the new shipping regulations;

– scalable content delivery by the Maritime English instructors, as courses can be standardized and customized for different ranks or years of training.

An overview of the benefits of OLP for integration into Maritime English training logically demonstrates its superior suitability for developing both hard and soft skills of marine engineers, as it enables offline training, integrates technical and soft skills modules within a single platform, and ensures consistent progress and compliance tracking even without internet access.

A central focus of the research is the integration of hard and soft skills within Maritime English training, supported by the OLP learning platform. In training marine engineers who can quickly adapt, respond decisively and remain resilient in the rapidly changing and unpredictable maritime industry, it is important to focus on both technical knowledge and interpersonal skills.

Hard skills are often categorized as technical or practical abilities (Lamri & Lubart, 2023), or as tangible, quantifiable competencies related to the operation of specific equipment (Liu & Liu, 2021). These skills are particularly valued in the workplace as they usually lead to measurable results (Hendarman & Cartner, 2018).

In the context of marine engineering, technical skills are critical to ensure the professional training of ship engineers to operate main and auxiliary machinery and on-board electrical systems. Possession of these skills contributes to compliance with safety and environmental standards and is key to the maintenance, repair and modernization of ships in accordance with the principles of the Green Deal. The International Maritime Organization (IMO) outlines the core technical competencies required for both operational and management levels in marine engineering through Tables III/1, III/2, and III/3 of the STCW Convention (1978/95), as well as in training programs of IMO Model Courses 7.02, 7.04, and 7.09.

However, there has been increasing attention to the importance of soft skills for the long-term success of maritime professionals. Some researchers argue that soft skills may even outweigh hard skills in importance, especially given how quickly technical knowledge can become obsolete in today's rapidly changing maritime environment (Schultheiss & Backes-Gellner, 2022). The term "soft skills" was introduced by Paul G. Whitmore at a US Army CONARC training session, where he described them as core job skills that rely less on machines and more on human interaction (Parlamis & Monnot, 2019). Unlike hard skills, soft skills are typically non-technical in nature and are more difficult to quantify (Byrne, Weston, Cave, 2020).

In the marine engineering context, these skills – such as communication, adaptability, leadership and time management – help create engineers who are not only technically prepared but also prepared to solve the interpersonal and operational problems that arise on board. These competencies enhance critical thinking, collaborative problem solving and situational judgment, all of which are vital in the high-risk environment of shipboard operations.

Bridging the gap between technical and soft skills development requires more than traditional classroom teaching. Digital platforms such as the Moodle LMS have begun to play a more important role in maritime education, especially when integrated with resources such as the Ocean Learning Platform (OLP). OLP's Offline Learning Gateway (OTG) allows learners to access content without relying on constant internet access at sea. By integrating OLP modules into subjects such as Maritime English, educators can develop learning experiences that are not only consistent and realistic, but also grounded in real operational challenges.

Despite these promising developments, there is currently a lack of research specifically examining how OLP digital resources support the integrated development of hard and soft skills in marine engineers, particularly in the context of Maritime English learning.

Main material presentation. This study uses a qualitative case study methodology to examine the use of the Ocean Learning Platform (OLP) as a tool for integrated development of hard and soft skills in marine engineering cadets. The study focuses on how the OLP modules, particularly those embedded in Maritime English course of Moodle LMS, facilitate the acquisition of both technical (hard) and interpersonal (soft) competencies in a real-world academic and shipboard training environment.

The study is conducted using an exploratory case study design, selected to gain an in-depth understanding of the practical implementation of OLP in a specific higher maritime educational institution in Ukraine. The case study design is appropriate due to the contextual uniqueness of this institution, which operates in a wartime relocation environment and offers its academic program in a blended learning format via Moodle LMS.

The research sample included 34 engineering cadets from the Faculty of Marine Engineering: 14 full-time and 20 part-time students. All cadets participated in the 2024–2025 bachelor's degree Training Program and were enrolled in Maritime English learning using OLP modules. Participation was voluntary, and all participants were informed of the objectives of the study.

In addition, interviews were conducted with three instructors responsible for developing, delivering and evaluating Maritime English and technical training courses using OLP to gain insights from a pedagogical and training objectives.

– Content analysis of selected OLP modules.

Selection of OLP modules for learning Maritime English was conducted, with a focus on engine room communication, safety procedures and technical vocabulary aligned with the standards outlined in the STCW Code. This analysis aimed to ensure that the language content was both contextually relevant and pedagogically appropriate for maritime cadets operating in academic and shipboard environments.

The process involved a targeted selection from the OLP digital library of modules suitable for the specific learning objectives. The modules with relevant topics were selected based on their relevance to the core competencies expected of marine engineers, as well as their potential to enhance the learning of maritime English through authentic, scenario-based content: Engine Room Emergencies, Diesel Engine Fuel Injection System, Fuel Oil Bunkering, Basic Hydraulics from 'Marine Engineering' module; Operation of Generators, Electrical Distribution, Electric Propulsion from 'Electrical, Electronic, and Control Engineering' module; Safety in Dry Docks and Repair Yards, Permit to Work, Enclosed Space Entry from 'Controlling the Operation of the Ship and Care for Persons Onboard' module. In addition, topics of a 'Soft Skills' module – Stress Management and Behavior-Based Safety – were integrated to support the development of interpersonal and decision-making competencies.

– Structured interviews with instructors and a focus group of cadets.

To gather professional insights into the implementation of OLP , student engagement, and observed skill development, the questions for instructors were focused on getting the information on their personal experience of integrating OLP modules into Maritime English teaching, the most effective OLP modules for hard skills development, the methods to observe improvements in cadets' communication or decision-making skills, technical or pedagogical challenges they encounter, methods to work with LMS data (analytics, quiz results) to inform on the assessment of cadet progress.

A focus group survey of cadets was conducted to explore their views on the effectiveness of learning with OLP modules, accessibility of materials, challenges, user experience, learning difficulties, skill development outcomes and personal growth as a communication partner. The questions addressed to students were aimed at obtaining information on the OLP modules they found most useful or challenging, their attitude towards real-life scenarios and their help in developing communication skills or teamwork skills, moments of feeling supported by e-learning for communicating on technical issues, the strongest incentive for this study from the list: the technical side of OLP, Maritime English learning environment con-

ducive to communication, personal motivation, the attractiveness of offline access, integration with the LMS Moodle.

– Specifically shaped pedagogical methods to develop integrated technical and soft skills.

Even without an appropriate pedagogical approach these comprehensive content analysis and structured interviews with instructors and a focus group of cadets do not ensure integrated development of both hard and soft skills of marine engineers. Practice proves that only specifically shaped pedagogical methods make it possible to enhance learners' engagement in industry-specific terminology acquisition and communicative practices essential for safe and effective shipboard operations.

Although the OLP has a language training module ("Pilot on the Bridge"), we did not apply its content due to suitability exclusively for the specifics of deck officers. Its well-structured solution allowed us to get some tips for organizing the use of digital resources (dialogic learning with simultaneous listening and checking comprehension followed by mini tests for formative assessment of students).

Before the start of training, to adapt the learning materials to the educational goals of developing students' technical and soft skills, the content of the digital OLP learning materials was used as a basis for creating communicative tasks by Maritime English instructors. Adaptive communicative tasks (ACT) were developed using digital tools such as Kahoot!, Wordwall, Padlet, MagicSchool, Miro. Subsequently, the developed ACT were integrated into the Moodle LMS, which OLP does not have in its arsenal. The placement of adaptive communicative tasks in the Moodle LMS was carried out according to the principle of contextual allocation. Their advantages were the ability to both promote the activation of the process of developing students' hard and soft skills and track the progress of cadets in achieving their learning goals.

Various ACT based on the content of the OLP included clicking on the heard phrase, dragging labels to the corresponding images, marking the names of objects, pronouncing the names of objects with subsequent verification, recognizing a word according to the provided description and naming it, choosing the correct word from several answer options, taking a quiz, building a dialogue according to some changes in the situation, filling in the gaps in communication, and others.

Student progress tracking in the Moodle LMS included assessments (quizzes, assignments, progress reports, rubrics, STCW-compliant checklists, or Moodle LMS dashboards), analysis of engagement levels in interactive tasks and frequency of individual follow-up work on learning modules.

These tools allowed instructors to monitor both technical skill acquisition and soft skill application in real time. The data collected also supported formative feedback and adjustments to individual learning paths based on trends in student engagement and performance.

Qualitative data analysis was conducted throughout the study to identify patterns and conclusions relevant to the study. The results were organized around three key domains that emerged from the analysis:

– Technical skills acquisition is focused on participants' learning related to machinery operation, the ability to identify and resolve technical problems and an understanding of maintenance and repair IMO safety regulations.

– Soft skills development emphasizes the development of interpersonal and cognitive skills, including communication, decision-making, leadership, critical thinking, and teamwork. These skills were identified as crucial for effective workplace integration and professional growth.

– Blended learning effectiveness assessment examines how well the blended learning model facilitated skill acquisition. Findings were drawn from both student feedback and performance data to assess the strengths and limitations of the instructional approach.

The study is limited to a single institution, under extreme wartime conditions, which may impact the generalizability of the results. The lack of a comparison group using other platforms (e.g. LearnMarine or Seably) is also a limitation. Nevertheless, the study provides valuable information on the practical integration of OLP into blended maritime education.

Summarizing the results of the study on the extent to which the use of the OLP can become a tool for optimizing the integrated development of hard and soft skills of marine engineers, we can state that we have identified the following trends:

1. Increasing technical competence

The students reported improved knowledge of the engine room machinery operation from the electronic and video materials of OLP modules, including operating and emergency engine control systems and better mastered scheduled maintenance procedures and consolidated knowledge of safety rules.

Practical modules and interactive simulations allowed cadets to more confidently troubleshoot and diagnose them in virtual scenarios that simulate real conditions. Test results and Moodle LMS analytics showed a noticeable improvement in the memorization of technical content over time.

2. Soft skills development

Regular implementation of adaptive communication tasks (ACT) developed by Maritime English instructors improved the focus group students' assessment results. Their collaborative work with colleagues helped students develop their critical thinking, improve communication especially in simulated emergency situations, be more proactive in making critical decisions and cooperate tolerantly for the safety of the crew and the vessel.

Scenario-based modules, especially those simulating emergencies or leadership roles on board, reinforced leadership and interpersonal skills. Analysis of students' reflections and feedback from participating in the experiential learning demonstrated increased confidence in the effectiveness of collaborative problem-solving and team management of various situations on board.

3. Blended learning effectiveness

Participants appreciated both the flexibility of the OLP electronic learning materials and the adaptive communication tasks (ACT) as they allow them to complete at their own pace, integrating with on-board or classroom learning.

Completion and engagement data from the LMS showed that over 80% of users consistently involved with both hard and soft skills modules, indicating a balanced learning experience. The vast majority of students reported that learning Maritime English using OLP and adaptive communication tasks (ACT) was more engaging and less intimidating than traditional methods, improving motivation and retention.

Conclusions. In the process of learning Maritime English to full-time and part-time marine engineers, the Ocean Learning Platform (OLP) effectively supports the development of both hard and soft skills in the field of marine engineering.

The Ocean Learning Platform (OLP) can be not only a technical training tool, but also a means of developing core soft skills that contribute to safe and effective work in the marine engineering field.

For cadets and working marine engineers, successful integration of both skill sets depends on thoughtfully designed digital learning. A key strategy involves incorporating adaptive communicative tasks (ACTs) developed by Maritime English instructors into the Moodle learning management system (LMS). These tasks, based on carefully selected OLP modules, help to link theoretical knowledge with the soft skills demands of life at sea.

The modular nature of OLP, combined with the interactive format of ACT and the built-in digital assessment tools in Moodle, promotes higher levels of student engagement and better results – especially when combined with real-world on-boarding learning.

Using digital tools, the Moodle platform tracks student progress, provides valuable information on student performance, and allows instructors to quickly provide feedback to better meet individual student learning needs. In summary, OLP offers a flexible and scalable solution for maritime education and training (MET) institutions seeking to meet STCW standards while equipping learners with both hard and soft skills required in today's maritime industry.

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