

У статті висвітлено міжнародні ініціативи зі стандартизації термінології БПС, зокрема документи NATO STANAG 4671, ASTM F3322 та ISO/TC 20/SC 16, що визначають базові основи для забезпечення сумісності та безпеки.

Дослідження аналізує проблеми, пов'язані з відсутністю уніфікації термінів, розбіжностями між галузевими поняттями, труднощами перекладу та етичними питаннями, які можуть ускладнювати міждисциплінарну та міжкультурну взаємодію. Наголошується на потребі міжнародної співпраці у створенні багатомовних глосаріїв і термінологічних баз даних, які мають бути точними, доступними й постійно оновлюваними відповідно до технологійного прогресу.

Особливу увагу приділено ролі освіти у формуванні термінологічної компетенції. Інтеграція англійської термінології БПС у навчальні програми із землеустрою та геодезії підвищує здатність студентів працювати в міжнародному середовищі, розуміти технічну документацію та брати участь у глобальних проєктах. Запропоновано використання проєктоорієнтованого навчання та програмного забезпечення, як-от Pix4D і DJI Terra, для поєднання теорії з практикою.

Загалом стаття обґрунтовує потребу гармонізованої та етичновиваженої термінології БПС як засобу підтримки сталого використання земель, професійної підготовки та міжнародної співпраці.

Ключові слова: термінологія БПС, землеустрій, геодезія, стандартизація, геопросторові науки, проблеми перекладу, міжнародні стандарти, термінологічна компетенція, технічна освіта, багатомовні глосарії.

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## OLP-BASED ACTIVITIES TO DEVELOP CRITICAL THINKING IN MARINE ENGINEERING STUDENTS

*This article considers the problem of developing critical thinking in marine engineering students through the Ocean Learning Platform (OLP) based activities aimed to apply in process of Business English learning. Among other competencies critical thinking holds an essential role for marine engineers who operate in complex, high-risk and often unpredictable environments. Critical thinking involves the ability to make informed decisions about complex problems and collaborate with others to solve them.*

*This experimental study examines the use of the OLP e-learning system integrated into the Moodle LMS in a blended learning master's program for cadets at the Faculty of Marine Engineering. The integration of the OLP tasks themselves and specifically generated by teachers of Business English OLP-based activities, serves to develop both communicative competence and critical thinking. The Moodle LMS platform provides convenient feedback for full-time and part-time cadets, also during practical training on ships.*

*The objective of the article is to analyze the feasibility of developing specific activities based on OLP, focused on more effective development of critical thinking of marine engineers. The tasks purposed to solve the objective are as follows: 1) to define the concept of "activities based on OLP, focused on more effective development of critical thinking of marine engineers"; 2) to track the impact of activities based on OLP*

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*in the process of learning Business English on the development of critical thinking of marine engineers. The methods used in this study include analysis, testing, survey, self-assessment, expert assessment, questionnaire, interpretation, and generalization of the validity of the experiment.*

*Key words: OLP-based activities, critical thinking, Business English, marine engineers.*

**The statement of the issue.** In today's shipping world, critical thinking is essential for marine engineers who operate in complex, high-risk and often unpredictable environments. Their ability to quickly analyze situations, assess risks and make informed decisions directly impacts on the safety of the crew, the vessel, the cargo and the marine environment.

Real life incidents show how standard procedures are often insufficient. In 2013, when the vessel Emma Maersk suffered an engine room flooding in the Suez Canal, engineers had only minutes to act. During the 2017 fire on the MSC Daniela, the crew had to maintain critical systems in conditions of smoke and power loss. In 2021, Ever Given engineers had to stabilize power and communications to ensure towing and maneuvering under high stress conditions.

Such incidents highlight the need for strong critical thinking skills, especially when clear instructions are lacking. Therefore, developing these skills is a priority in Maritime Education and Training (MET).

To achieve this goal, MET uses simulators, case-based learning, role-playing and team scenarios. Along with traditional methods, e-learning platforms are increasingly being used due to their flexibility, accessibility, adaptive learning paths and secure learning environment. Popular platforms include Engine Resource Management (ERM), Planned Maintenance System (PMS) Training, Engine Room Emergency Management (EREM) and Ocean Learning Platform (OLP).

This study examines the use of the OLP e-learning system integrated into the Moodle LMS in a blended learning master's program for cadets at the Faculty of Marine Engineering. The integration of the OLP tasks themselves and specifically generated by teachers of Business English OLP-based activities, serve to develop both communicative competence and critical thinking. The Moodle LMS platform provides convenient feedback for full-time and part-time cadets, also during practical training on ships.

**The analysis of relevant research.** Although our article specifically focuses on the types of learning activities based on the Ocean Learning Platform (OLP-based activities) that will develop critical thinking in future marine engineers, we found that there is still insufficient research on OLP itself and methods of work with it.

More remarkable developments are made by C. Mora, A. Marrero, R. Mellado, B. Añorbe, J. Martin-Gutierrez [4] regarding the possibilities of problem-based learning (PBL) using mobile devices and Internet technologies, which, in their opinion, significantly stimulate independent learning, decision-making in extreme situations and the development of critical thinking in future marine engineers.

Also, the group of authors Y. Pan, A. Oksavik, H. Hildre in their collective work "Making Sense of Maritime Simulators Use: A Multiple Case Study in Norway" [6] consider the simulator not only a tool, but an actor that unites the interests of industry, instructors and cadets into a single actor-network. This contributes to a deeper understanding of situations and the formation of reflective critical thinking.

During the work on the research topic, we found that OLP is an electronic learning platform with the integration of training courses, videos, tests, cases, including simulation scenarios that simulate real world situations (emergency response, risk assessment, maintenance, etc.). Some OLP modules have interactive components that simulate the real environment as Engine Room Emergency Management (EREM), but this is not a full virtual reality (VR) simulation.

Researches P. Nosov, O. Dyagileva, A. Yurzhenko, S. Kulinic, T. Bosiiuk [5] consider OLP as a part of simulation or blended learning in maritime education, since it is used as preparation

for practice on full simulators, cadets could study terminology, guidance to actions, evaluate scenarios. A great advantage of using OLP is that the cadet can train in situations where mistakes do not have fatal consequences. These ideas outlined in a separate study on aspects of increasing the effectiveness of maritime simulation training and training using platforms such as OLP.

We also excavated that Ocean Technologies Group’s OLP platform stands out among digital platforms due to its offline learning (OTG) capabilities, seamless integration with LMS systems such as Moodle, and focus on IMO-compliant learning content. Compared to platforms such as LearnMarine, Seably, or Marlins, OLP provides a more comprehensive learning environment for marine engineers, especially in environments with limited internet access.

Its ability to support the teaching of Business English, a key component of developing both critical thinking and communication skills, makes it particularly relevant. Features such as automated tracking, integration with SMCP and STCW standards enhance both technical proficiency and soft skills development.

The OLP framework thus allows teachers to design close to real-world assignments that develop critical thinking skills in marine engineering students, particularly through scenario-based Business English activities available both online and offline. This integration plays a crucial role in preparing cadets to respond effectively and adaptively in a dynamic maritime environment.

It was found that most of the OLP training modules were descriptive in nature and focused on the reproductive testing of theoretical knowledge, so we focused on developing such exercises focused on the OLP context, which would develop the critical thinking of marine engineering students with the idea of their further testing in our experimental study.

The conducted study of various sources [1; 8; 3] allowed us to define the concept of "critical thinking of marine mechanics". Therefore, critical thinking of a marine mechanic is the ability to purposefully, logically and objectively assess technical situations, promptly analyze risks, check existing instructions for compliance with conditions, generate effective solutions in normal and emergency conditions on board a vessel, taking into account the safety of the crew, the vessel and the environment.

**The purpose of the article.** Finally determining the relevance of the topic chosen for this study, we assume that **the objective** of the article will be to analyze the feasibility of developing specific activities based on OLP, focused on more effective development of critical thinking of marine engineers. **The tasks** purposed to solve the objective are as follows: 1) to define the concept of "activities based on OLP, focused on more effective development of critical thinking of marine engineers"; 2) to track the impact of activities based on OLP in the process of learning Business English on the development of critical thinking of marine engineers. The methods used in this study include analysis of scientific literature, content of online linguistics modules, pedagogical digital tools; testing, survey, self-assessment, expert assessment, student questionnaire; interpretation, and generalization of the validity of the experiment.

**The body of the research.** The work on creating and testing activities based on OLP, focused on the development of critical thinking, was carried out in several stages:

- 1) defining the concept of "activities based on OLP, focused on the development of critical thinking" and selecting hypothetically suitable ones from the existing pedagogical arsenal of MET;
- 2) analyzing electronic materials that fill the educational modules of the OLP platform and determining their suitability for the development of activities based on OLP, focused on the development of critical thinking, specifically for marine engineers;
- 3) familiarizing a focus group of full-time and part-time students with the objective of experimental training and conducting adapted Watson-Glazer entrance testing to check their initial level of critical thinking;

4) correlating the identified activities based on OLP, focused on the development of critical thinking with digital tools for generating tasks to track the effectiveness of their use for the development of critical thinking;

5) posting generated tasks to track the effectiveness of their use for the development of critical thinking on the Moodle LMS platform;

6) summarizing the quantitative results of the conducted experimental study based on the verification tasks completed by students on the Moodle and comparing adapted Watson-Glaser testing the initial and eventual level of critical thinking; analysing qualitative outcomes from filling in a questionnaire in Google Forms to determine the student's reflection and a qualitative change assessment scale filled by the teacher.

Focusing on the task set to define the concept of "types of OLP-based activities focused on the development of critical thinking", we turned to the classical pedagogical theories of critical thinking by Bloom and Paul and Elder.

According to Benjamin Bloom's taxonomy of the hierarchy of cognitive skills, the levels of thinking develop from simple to complex [2]:

1. Remember: knowledge of terms, facts.
2. Understand: explanation of ideas, interpretation.
3. Apply: use of knowledge in new situations.
4. Analyze: identification of relationships, division into parts.
5. Evaluate: critical assessment of arguments, choice between alternatives.
6. Create: formation of new ideas, solutions, and models.

Therefore, when developing OLP-based activities, we focused on levels 4–6, which stands for analysis, evaluation, and creation. For example, analyzing situations in cases, reasoning decisions, developing instructions or solutions in communication in the engine room.

According to the Paul and Elder critical thinking model [7], critical thinking is a process of independent, disciplined, objective thinking taking into account universal intellectual standards, the main components of which are: elements of thought, purpose, question, assumptions, point of view, information, inferences, concepts, implications, universal intellectual standards, clarity, accuracy, logic, depth, breadth.

Taking this information into account, we should also focus on the types of work when it is important to be able to analyze business ethical conflicts, paying attention to assumptions, logic, point of view, etc.

Summarizing the work done, we have come to the definition of the concept of "OLP-based activities focused on the development of critical thinking". We formulate them as interactive learning activities based on the Ocean Learning Platform (OLP) content, created taking into account Bloom's cognitive taxonomy and the elements of critical thinking according to Paul and Elder, and are aimed at developing in marine engineering cadets the ability to analyze, evaluate, argue and make sound decisions in technically complex and non-standard conditions of professional activity.

Our assumption is that these activities should cover the higher levels of Bloom's taxonomy – analysis, evaluation, creation; activate the key elements of thinking according to Paul and Elder – purpose, assumptions, facts, point of view, logic, consequences; to involve intellectual standards – accuracy, clarity, depth, logicity.

Thus, from the types of activities used in MET for conducting our experiment, we chose simulation scenarios, case analyses, Socratic questions, concept maps, analytical analysis of various sources, debates, role-playing games, reflective analysis, discussion of ethical scenarios, discussions and evaluation of options for action in complex situations (accidents, unforeseen technical failures, etc.).

The format in which we applied the classical abovementioned theories in developing OLP-based activities has acquired a certain structure: goal, elements of critical thinking in relation to the critical thinking model used. For example, OLP-based activity: Case study "Emergency cargo delay due to technical issue".

Option for applying Bloom's taxonomy (3 levels):

*Goal:* To develop critical thinking through the analysis of a business situation in a maritime context.

*Analyze:* Students analyze the reasons for the delivery delay and the interests of the parties  
What key factors caused the delay?

*Evaluate:* Discussion of better technical solutions (Which course of action is best in this situation? Why?).

*Create:* Development of an official letter to a partner explaining the situation.

2. Option for integrating the Paul and Elder model:

*Goal:* To understand how to resolve a conflict situation in communication.

*Points of view considering:* Ship's captain, company logistician, client

*Information analysis:* Terms of the contract, technical report, route

*Making assumption:* "The client will not accept being late" – is this so?

*Anticipating consequences:* How will each decision affect the company's reputation?

This approach allowed us to clearly link the activity to the theory, develop critical thinking and business English, and meet the requirements of STCW and MET based on the use of authentic electronic materials of the OLP.

Our next step was to analyze the electronic materials that are contained in the educational modules of the OLP platform and determine their appropriateness for developing OLP-based activities aimed at developing critical thinking, in particular for the students of Marine Engineering Faculty.

The process involved a targeted selection of modules from the OLP digital library that were suitable for 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 improve communication competence and develop critical thinking through authentic, scenario-based content: Engine Room Emergencies, Diesel Engine Fuel Injection System, Fuel Oil Refueling, Fundamentals of Hydraulics from the "Marine Engineering" module; Generator Operation, Power Distribution, Electric Propulsion from the "Electrical, Electronic, and Control Engineering" module; Safety in Dry Docks and Repair Yards, Permit to Work, Enclosed Space Entry from the "Controlling the Operation of the Ship and Care for Persons Onboard" module. In addition, the topics of the "Soft Skills" module – Stress Management and Behavior-Based Safety – were integrated to support the development of interpersonal and critical decision-making competencies.

A focus group of students (12 full-time and 18 part-time) was compiled for the purpose of experimental learning, as well as testing of cadets to determine the initial level of critical thinking was conducted. For this purpose, we created our own version of the adapted Watson-Glaser test for marine engineering cadets – 3 blocks of 3 questions (9 in total), focused on practical situations from the ship's engine crew.

1. Evaluating Arguments

*Situation:* A minor oil leak from the auxiliary engine was detected on the ship.

1.1. Argument: There is no point in doing anything, because we will arrive at the port soon.

– Is this a strong or weak argument?

1.2. Argument: It is necessary to localize the leak, because it can cause a fire.

– Is this a strong or weak argument?

1.3. Argument: The mechanic working on this machine always breaks something.

– Is this a strong or weak argument?

2. Interpretation

*Situation:* During the flight, the coolant temperature increases, although the engine speed has not changed.

2.1. Conclusion: This indicates a possible malfunction in the cooling system.

– Does it follow logically from the facts?

2.2. Conclusion: The main engine has probably failed.

– Does it follow logically from the facts?

2.3. Conclusion: The increase in temperature is due to a decrease in pressure in the air system.

– Does it follow logically from the facts?

### 3. Deduction

*Instruction:* All main engines that have more than 5000 hours of operation should be shut down for maintenance.

3.1. Engine A has 5200 hours.

– Should it be shut down?

3.2. Engine B has 4800 hours.

– Should it be stopped?

3.3. If the engine is not stopped after 5000 hours, the vessel will receive a fine.

– Engine C has 5050 hours and has not stopped. Will there be a fine?

To correlate the identified OLP-based activities aimed at developing critical thinking with digital tools for generating assignments to track the effectiveness of their use for developing critical thinking by placing them on the Moodle LMS, we considered and analyzed the capabilities of the Miro, Twine, H5P, Padlet, Flip, Mentimeter, etc. tools.

The most powerful options for Moodle were found to be H5P and Twine. They allowed to generate interactive tests, simulations, videos with embedded questions and case studies.

The tasks developed to test critical thinking looked like this:

– a simulated emergency situation on a ship with several options for action,

– an interactive video from the engine room, where at a certain stage you need to draw a conclusion or choose the right solution,

– deep analytical questions with an open answer.

We found the opportunities of the Padlet, Miro, and Flip tools to generate tasks for testing critical thinking of the cadets:

– a collective map of the causes and consequences of a technical malfunction,

– a case analysis on the board,

– logical diagrams (fishbone, flowcharts),

– a mind map of critical decisions in the engine room,

– a video recording of reflections: "How would I act in this situation?"

The Mentimeter, Slido, and Kahoot tools were used by us to conduct formative assessment. The generated tasks included debates, real-time scenario discussions, and mental maps.

Due to the possibility of relatively easy generation and integration into the Moodle learning management system and automated tracking of the progress of critical thinking development in cadets, these tools turned out to be indispensable assistants and facilitators of the experiment we conducted.

In order to quantitatively analyze the results of the study on the development of critical thinking in marine engineering cadets, the quantitative results of the preliminary and final tests of the level of critical thinking were collected, and the difference between them in quantitative and percentage terms was calculated.

Also, to conduct a qualitative analysis, a questionnaire was created in Google Forms to determine student reflection. The purpose of filling out the questionnaire by students was to identify changes in the way of thinking, analysis and decision-making.

The questions were of an exploratory nature:

1. What does "critical thinking" mean to you in the profession of marine engineer? (open question)

2. Has your attitude towards the analysis of technical situations changed after completing the training module? (Yes / No)

3. If so, how exactly? (open question)

4. What type of tasks helped you think deeper or differently? (multiple-choice question: simulations / video questions / discussion with others / visual diagrams / other \_\_\_\_\_)

5. Describe a situation where you realized that you had made a critical decision: analysis, doubt, evaluation of alternatives. (open question)

6. How confident are you in your ability to make sound decisions in difficult technical conditions? (open question) (scale 1 – 5, where 1 is not at all, 5 is completely confident)

In addition, was used a qualitative change assessment scale (for the teacher). This type of analysis allowed the teacher to assess the following parameters at three levels of detection in students (0/no change, 1/partial change, 2/pronounced change). The applied qualitative change assessment scale included the ability to recognize erroneous judgments, the validity of decisions in simulations, the depth of reflection in the questionnaire, the use of an analytical approach, the application of logic in the analysis of professional cases.

The results of the comparison of the quantitative processing of the initial and final adapted Watson-Glaser critical thinking tests, the completion of the Google Forms questionnaire to determine the student's reflection, as well as the qualitative analysis of the cadets' performance of tasks posted on the Moodle LMS to track the effectiveness of using OLP-based activities in experimental learning to develop critical thinking, as well as the qualitative change assessment scale (for the teacher) used by us, confirmed the validity of the experimental study. A statistically significant increase was found, and 70% of students demonstrated an improvement in analytical thinking in open-ended responses, which is evidence of a valid study from a pedagogical and methodological point of view.

**Conclusions.** In our study we analyzed the concept of "Ocean Learning Platform (OLP)-based activities" as a structured pedagogical form that integrates digital resources, simulation tasks, interactive modules, and communicative interaction aimed at developing cognitive skills in a professionally oriented learning environment.

It has been proven that OLP-based activities aimed at developing critical thinking in future marine engineers should have such features:

- be professionally relevant to the specifics of marine engineers' work on a ship;
- take place in the context of simulated situations that are close to real working conditions in the engine room;
- activities simulated using digital tools (H5P, Flip, Twine, Miro, etc.) should be interactive;
- the development of critical thinking occurs in close interaction with the improvement of cadets' communicative competence through the parallel improvement of their technical and soft skills.

The results of the experimental implementation of OLP-based activities in the process of learning Business English showed:

- an increase in the level of critical thinking of cadets (according to the results of pre- and post-testing),
- an increase in the ability of cadets to analyze, argue, evaluate and make sound decisions in an English-speaking professional context.

Qualitative analysis of questionnaires and reflections of cadets confirmed changes in approaches to thinking:

- increased attention to the logical sequence of arguments,
- readiness to doubt and rethink information,
- development of skills to analyze technical descriptions, instructions, situations in English.

Thus, the use of OLP-based activities in the process of learning Maritime English is an appropriate and pedagogically justified step to strengthen the professional training of marine engineering cadets.

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## ЗАВДАННЯ НА ОСНОВІ OLP ДЛЯ РОЗВИТКУ КРИТИЧНОГО МИСЛЕННЯ У СТУДЕНТІВ – МОРСЬКИХ ІНЖЕНЕРІВ

У статті розглядається проблема розвитку критичного мислення у студентів – майбутніх морських інженерів – за допомогою діяльності на основі *Ocean Learning Platform (OLP)*, призначеної для застосування в процесі вивчення ділової англійської мови. Серед інших

компетенції критичне мислення відіграє важливу роль для морських інженерів, які працюють у складних, високоризикових і часто непередбачуваних середовищах. Критичне мислення передбачає здатність ухвалювати обґрунтовані рішення щодо складних проблем та співпрацювати з іншими для їх вирішення.

Це експериментальне дослідження розглядає використання системи електронного навчання OLP, інтегрованої в Moodle LMS, у магістерській програмі змішаного навчання для курсантів факультету морської інженерії. Інтеграція самих завдань OLP і спеціально розроблених викладачами ділової англійської мови видів діяльності на основі OLP сприяє розвитку як комунікативної компетенції, так і критичного мислення. Платформа Moodle LMS забезпечує зручний зворотний зв'язок для курсантів денної та заочної форм навчання також під час практичного навчання на судах.

Метою статті є аналіз доцільності розроблення спеціальних видів діяльності на основі OLP, спрямованих на більш ефективний розвиток критичного мислення морських інженерів. Завдання, спрямовані на вирішення поставленої мети, такі: 1) визначити поняття «діяльність на основі OLP, спрямована на більш ефективний розвиток критичного мислення морських інженерів»; 2) відстежити вплив діяльності на основі OLP у процесі вивчення ділової англійської мови на розвиток критичного мислення морських інженерів. Методи, що використовуються в цьому дослідженні, включають аналіз, тестування, опитування, самооцінювання, експертне оцінювання, анкетування, інтерпретацію та узагальнення валідності експерименту.

Ключові слова: діяльність на основі OLP, критичне мислення, ділова англійська мова, морські інженери.

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## МОТИВАЦІЙНІ ЧИННИКИ ФОРМУВАННЯ ПОТРЕБИ ПЕДАГОГІЧНИХ ПРАЦІВНИКІВ У ПРОФЕСІЙНОМУ РОЗВИТКУ В СИСТЕМІ ПІСЛЯДИПЛОМНОЇ ОСВІТИ

У статті обґрунтовано актуальність процесу професійного розвитку педагогічних працівників у контексті трансформаційних змін, характерних для освітньої галузі загалом і реалізації Концепції Нової української школи зокрема; пріоритетність мотиваційно-потребнісної складової означеного процесу на основі окреслених наукових позицій щодо співвіднесення мотиву та потреби особистості в активній діяльності.

Автором представлено авторське тлумачення сутності поняття «мотиваційний чинник» як джерела впливу на процес «збудження» у свідомості вчителя певних моральних ідей чи образів, які втілюються в діяльності, спрямованій на задоволення його потреби у професійному розвитку. Залежно від характеру впливу визначено й обґрунтовано зовнішні та внутрішні мотиваційні чинники. До першої групи належать чинники, які визначають умови, цілі та зміст діяльності, що реалізується в цій сфері, чим об'єктивно впливають на появу відповідних мотивів. Другу групу складають внутрішні мотиваційні чинники, які безпосередньо впливають на співвідношення балансу між діями працівника та причинами, які їх зумовлюють та пояснюють, що й зрештою спричинює активність особистості, спрямовану на задоволення потреби у професійному розвитку. До об'єктивних автор відносить

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