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APPLICATION DESIGN FOR MARITIME ENGLISH LEARNING UTILIZING INTERACTIVE MULTIMEDIA

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ABSTRAK

Bahasa Inggris Maritim diakui sebagai bahasa utama komunikasi di laut, sehingga penguasaannya krusial bagi kadet dalam pendidikan vokasi maritim. Meskipun studi-studi sebelumnya tentang pembelajaran berbasis teknologi telah mengeksplorasi platform multimedia umum dan perangkat bahasa, penelitian yang membahas aplikasi yang dirancang khusus untuk komunikasi VHF masih terbatas. Studi ini mengembangkan dan mengevaluasi aplikasi kosakata berbasis web yang dibangun dengan PHP, mengintegrasikan dialog situasional yang selaras dengan silabus semester keempat program Teknologi Rekayasa Operasi Kapal. Pendekatan kuantitatif digunakan dengan mendistribusikan kuesioner kepada 50 kadet untuk memeriksa aksesibilitas, kegunaan, dan efektivitas aplikasi. Hasil penelitian menunjukkan bahwa aplikasi tersebut berfungsi dengan baik di komputer pribadi maupun ponsel pintar, dan para kadet menganggapnya menarik, ramah pengguna, berorientasi pada silabus, dan bermanfaat untuk meningkatkan keterampilan berbicara Bahasa Inggris Maritim mereka. Studi ini memberikan kontribusi kebaruan melalui desain dan validasi awal aplikasi web khusus yang berfokus pada VHF, mengisi celah yang ditinggalkan oleh penelitian sebelumnya yang menekankan platform pembelajaran digital yang lebih umum.
Kata Kunci: *desain aplikasi, bahasa Inggris maritim, multimedia interaktif*

ABSTRACT

Maritime English is recognized as the primary language of communication at sea, making its mastery crucial for cadets in maritime vocational education. While previous studies on technology-enhanced learning have explored general multimedia platforms and language tools, limited research has addressed applications specifically designed for VHF communication. This study developed and evaluated a web-based vocabulary application built with PHP, integrating situational dialogues aligned with the fourth-semester syllabus of the Ship Operation Engineering Technology program. A quantitative approach was employed by distributing questionnaires to 50 cadets to examine the application's accessibility, usability, and effectiveness. The results showed that the application functioned well on both personal computers and smartphones, and cadets perceived it as engaging, user-friendly, syllabus-oriented, and beneficial for improving their Maritime English speaking skills. The study contributes novelty through the design and initial validation of a specialized VHF-focused web application, filling a gap left by prior research that emphasized more general digital learning platforms.
Keywords*: application design, maritime English, interactive multimedia*

INTRODUCTION

Indonesia has an important role in the worldwide maritime industry. The first role is to provide the seafarers to major recruitment markets in Europe, North America, and Asia. Indonesian seafarers have the same quality as seafarers from the Philippines, India, Vietnam, Sri Lanka, Bangladesh, and other countries because the International Maritime Organization (IMO) established the Standard of Training, Certification, and Watchkeeping for Seafarers

(STCW) in 1995 (Phanphichit & Bartusevičienė, 2024) . Over the last two decades, the global market for seafarers has grown as young people in developed countries have lost interest in becoming commercial seafarers. They prefer to work on land since it is less dangerous than working at sea. However, due to shortcomings in personnel and organizations, Indonesian sailors find it difficult to grab possibilities. The qualifications of seafarers for their work on ships is one concern. Given this phenomenon arising from English communication in the global business context, the future focus should be on effective and clear communication for the achievement of given communicative goals based on mutual intelligibility in a multicultural setting," was said during the international maritime convention, which also addressed this phenomenon (Chirea-Ungureanu, 2021) So, it could be interpreted as communication in English focusing on clear and effective communication in order to attain communication goals from those who use it.

Communicating in English is one of the challenges for Indonesian sailors. The ability to communicate, particularly in English, on ships with crews of various nationalities and on international routes is a critical necessity for hiring seafarers (Ratnaningsih et al., 2024). This was done to ensure that the ship's operational activities at sea and in port operate well, avoiding work mishaps and ship accidents.

Miscommunication or misunderstanding in English communication in the realm of shipping can also result in material losses in the form of diminished company efficiency, in addition to creating accidents. One of the negative consequences of a communication breakdown is that it might harm people on land as well as ships. One example was the incident which was triggered by a miscommunication between the ship owner and the skipper. The ship's owner requested that the captain sail to the port of Fremental in Korea. The command, however, was misinterpreted by the skipper as an order to stop at the Australian port of Fremental. The ship's skipper then sailed to the port of Fremental in Australia. This incident caused loss of effective time and fuel which cost thousands of US dollars (Apostol-Mates & Barbu, 2015).
Moreover, based on preliminary observations, the oral communication abilities (speaking) of 85% of all cadets in the 3rd semester of the Ship Operation Engineering Technology Department were still at the beginning level. These findings were derived from test results obtained during CAS (Cadet Afternoon Speaking) exercises for cadets at this maritime polytechnic. This is an extra-curricular exercise designed to develop oral communication skills in English by stressing marine English vocabulary as a topic of conversation.

According to the description above, it was vital to strive for various media to develop these cadets' marine English-speaking skills, one of which was through leveraging technology. Fun learning activities that cadets in this polytechnic was expected to be able to improve communication skills in maritime English. So, the goal of this research was to create an interactive multimedia-based maritime English application that focuses on vocabulary development and dialogue in maritime English. As Junining et al. (2024) stated that learning has changed dramatically in recent decades due to the introduction of new chances for learning through the internet brought about by the technological revolution. Owing to the COVID-19 epidemic and the technology revolution, higher education institutions had introduced a number of innovative methods for English language instruction that are sustainable. So, the maritime English learning must be combined with the technology to reach to goals of the learning objectives which had the ability to improve oral communication proficiency.

Then, related to the theoretical background, media is the word "medium" in plural form. The medium can be thought of as the sender and the recipient's first or intermediate communication channel (Winarso, 2018). The Latin plural form of media gives the term media another meaning. This study focuses on educational media, namely media used as tools and

materials for learning activities, despite the fact that the concept of media is broad. Based on their type, learning media are divided into four categories: 1. Technology for printing materials. 2. Media produced with audiovisual equipment. 3. A computer-based learning platform 4. An online learning environment (Padang & Sitepu, 2023).

Meanwhile, the ability to generate multiple different answers to problems is referred to as planning. The planning phase of system design and implementation describes the formation of a system and can take the form of designing, planning, and sketching, or organizing different aspects into a single unit, and configuring hardware and software components. Determine all system needs, who will undertake these procedures, and how the overall design will be modified. Generally, planning moves from the input process to the output process (Kang, 2019). Furthermore, a model is required in the design of software applications to grasp the problem, define the operating business processes, and communicate with the parties engaged in the application's development. This design makes advantage of the fundamental concept of information systems. An information system is a system within an organization that reconciles the needs of daily transaction processing that supports managerial organizational operational functions with the strategic activities of an organization in order to provide certain external parties with the information required for decision making. An information system in an organization is a system that gives information to all levels of the company at any time. This system stores, obtains, modifies, processes, and conveys data obtained from an information system or other system equipment (Surbakti & Selly, 2023). So, technology is inseparable from our daily activities, including in the teaching and learning activities, mostly in higher education. As Devitriana (2025) stated that the integration of technology into educational practices has become essentially vital in enhancing students motivation and knowledge. The most important skill to improve in learning English is the speaking skill. The motivation and rate of students' interest must be built by the teachers in several ways. One of them is by using the interactive media (Ningrum et al., 2023). Then, as the results, the first goal of this research is to create an interactive multimedia-based marine English learning application. The second purpose is to learn about cadets' perceptions of the design of marine English learning applications.

RESEARCH METHODOLOGY

A quantitative approach was used in this research The reason for this discrepancy was that the goals of the two types of research are different: quantitative research seeks to identify the scope of an issue (Gusti et al., 2021). This was used to answer how to design marine English applications. This research employed a quantitative descriptive design with a correlational approach, as it used to measure cadets' perceptions in a quantifiable manner regarding the use of maritime English applications. The study involved two variables: the independent variable, which is the cadets' perception, and the dependent variable, which is the design of maritime English applications using interactive multimedia. The research used a simple random sampling technique to select 50 cadets from the population. Its main objective is to determine the relationship or influence between these variables. Since there is no intervention or manipulation of the independent variable, the study is observational rather than experimental, making it a correlational descriptive quantitative design.

Meanwhile, quantitative data are numbers and values obtained from questionnaires addressing perceptions of the use of marine English learning programs. By using the open ended questionnaire, most cadets gave positive perceptions related to the application (Luruk, 2025). The instruments utilized in this study were specially built applications and questionnaires about the use of marine English learning applications. The equipment was tested outside of the sample

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before being used on all samples. Establishing the instrument's quality, including its degree of validity, reliability, and objectivity, was the goal (Khanal & Chhetri, 2024).

A valid instrument is one that can accurately measure what is desired and provide data from the variables researched. The validity that will be employed in this study is content validity, which indicates that a test has content validity if it is consistent with the information or content presented. The requirements for research instrument dependability or trustworthiness refer to whether an instrument can consistently measure something that will be measured from time to time. Meanwhile, because the data obtained was in the form of scale values, the instrument's reliability was verified using the Cronbach Alpha Reliability Coefficient formula. Instrument reliability testing was performed on cadets from the same demographic who were not included in the sample.

One of the procedures for conducting the experiment was selecting research samples at random to conduct a pre-experiment (random sampling). This study's experimental phase entailed designing systems with UML (Unified Modeling Language) modeling. A common language for describing and illustrating object-oriented analysis and design procedures was called Unified Modeling Language, or UML. The Use Case Diagram describes the system/application, environment, and how the system/application interacts with its surroundings. The post-experimental stage, which marked the conclusion of the investigation, was the last phase. Cadets utilized and analyzed maritime English software in this project to ascertain user perceptions.

RESULT AND DISCUSSION

Result

The system that run in Surabaya Maritime Polytechnic's teaching and learning activities (KBM) is as follows: lecturers were required to create a learning implementation plan (RPP) that determined the stage of learning material that would be provided, the learning process, learning methods, learning media, and evaluation. learning. The lecturer then prepared the materials to be taught and decided on the learning media to be utilized in accordance with the previously created RPP or lesson plan. Next, gave the cadets with learning materials such as text books, PowerPoint presentations, or movies that displayed text and videos of practical activities, and conducted evaluations by recording questions and answering questions in student books as well as in practice to test pupils' level of proficiency in obtaining information.

The PHP programming language was used to create the application. Meanwhile, for design, used Boostrap, which included a CSS collection. This design encompassed the overall look of all pages, from the dashboard to the final outcomes. Everything that came from the application in the form of text, graphics, buttons, and so on constitutes the ultimated result in question. More information about the design step was provided in the use case diagram shown in Figure 1.

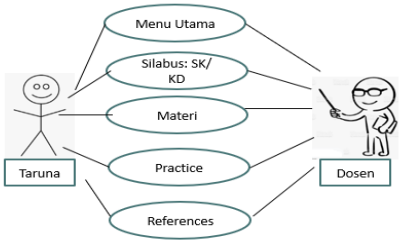

Figure 1. Application's initial use case

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In Figure 1 above, in the Use Case Diagram of the Initial Application, there were two actors that acted on the system that was being built: students and teachers. Figure 1 showed a Use Case Diagram that described all of the functionalities of the system being constructed.

Meanwhile, table 1 below illustrated how cadet/lecturer users could access the Use Case Diagram. The goal of Context was to obtain information depending on the currently available menú.

Table 1. Use case diagram description

Use Case	Access the main menu
User	Cadets/ Lecturers
Goal in context	User gets information based on the menu chosen
Preconditions	The learning media application is run and then displays the main menu
Trigger	The learning media application is launched, and the main menu appears.
Scenario	1. In the initial display, cadets/lecturers are asked to press menu options. 2. The system will display loading and then a menu will appear related to learning activities. 3. Cadets/Lecturers choose what they want. 4. Cadets/Lecturers press the menu button to select the menu to be displayed by pressing the "Start" button. 5. By pressing the "Back to home" button, Cadets/Lecturers will be presented with the main menu
Exceptions	the display does not appear because it does not comply with the command

Table 1 presents the use case diagram description for the *"Access the Main Menu"* feature in the learning media application intended for cadets and lecturers. The main objective of this use case is to enable users to obtain information based on the menu they select. Before the process begins, the precondition is that the learning media application must be running and the main menu must be displayed. The trigger for this use case occurs when the application is launched, causing the main menu to appear on the screen.

The scenario begins with cadets or lecturers being prompted to press one of the available menu options on the initial display. The system then processes the request, displaying a loading screen before presenting a menu related to learning activities. Users can choose the desired option and press the "Start" button to display the selected menu content. At any point, they may return to the main menu by pressing the "Back to Home" button. An exception occurs when the display fails to appear due to the system not following the given command, which could result from software malfunction or input errors. This use case description provides a clear overview of the user interaction flow, expected system responses, and potential error conditions in navigating the main menu.

The resulting application had the name DyMarE which was an abbreviation of Dyah Maritime English. This application could be opened by accessing the web link https://dymare.net/form.php. Furthermore, this application could also be accessed using a mobile phone or PC (personal computer) or laptop. In the initial application design, only

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material was available at the tenth meeting of the maritime English course. Later in development, material, evaluation and testing would be provided from the initial to the final meeting in one semester, namely semester 1 (one) to semester 4 (four). The main menu that appeared on the screen was shown in Figure 2 below.

Figure 2. Main menu display

Then, in the main menu the user can select and view advanced menus such as Syllabus which contained the syllabus for English courses. Then there was a Lesson menu which contains material from the course. Next, the students could see the Practice menu or exercises that could be used to practice according to the material discussed. The last one was the References menu which gave a reference source for course material which could also be accessed independently if the user wants to read or find out about the material directly from the source. Next, if the user selected the Syllabus menu, elements of the syllabus would be visible such as study program, competencies, expected results, basic competencies, topics, indicators and so on. The Syllabus menu display was shown in Figure 3.

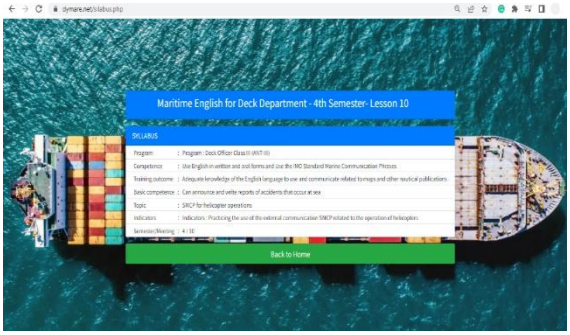

Figure 3. Syllabus menu display

When the users had finished with this menu and returned to the main menu, they could press the Back to Home button.

Furthermore, the second aim of this study was to determine cadets' perceptions of using the DyMarE learning application. Of the 50 (fifty) sample of cadets, they tried the Maritime English learning application and after they filled out a questionnaire consisting of 5 (five) statements regarding the application. The five statements were that the DyMarE application was interesting, helping understand the material, was easy to use, the suitability or accordance between the material and the syllabus, and the last was able to improve maritime English skills. The scale used in the questionnaire used the Alpha-numeric Likert Scale. Meanwhile, the analysis uses SPSS 22 to determine normality, validity and reliability. So, the results of the five indicators of use of the Maritime English learning application show a positive level of

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perception from its users. Meanwhile, cadets using the DyMarE application overall gave a positive perception.

Table 2. Cadets' perceptions on the DyMarE Application

	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	F	%	F	%	F	%	F	%	F	%
Interesting	40	80	10	20	0	0	0	0	50	100
Helping the understanding in the materials	45	90	5	10	0	0	0	0	50	100
Easy to use	50	100	0	0	0	0	0	0	50	100
Suitability between the material and the syllabus	40	80	10	20	0	0	0	0	50	100
Improve their Maritime English skills	48	96	2	4	0	0	0	0	50	100

Note: F = Frequency

The table 2 above showed the results of the cadets' perception of the DyMarE application. This could be proven by 80% of cadets stating that the application was interesting. Then 90% said that it helped them understand the material. Next, 100% strongly agree that the application was also very easy to use. Regarding the perception of suitability between the material and the syllabus, 80% indicated that it was very suitable and 96% or all cadets stated that they could really improve their Maritime English skills by using the DyMarE application.

Discussion

The development of the DyMarE application reflected a proactive approach to integrating digital technology into Maritime English learning, aligning with modern pedagogical practices and the digital literacy demands of maritime education. The system supported the standardized process of lesson planning and implementation, as lecturers were required to design a Learning Implementation Plan (RPP) that outlined instructional stages, teaching methods, media, and evaluation tools. This systematic process ensured that learning remained goal-oriented, measurable, and tailored to competency-based standards in maritime education.

The DyMarE application was built using PHP for programming and Bootstrap for the interface design. This choice proved beneficial for ensuring accessibility and responsiveness across various devices such as mobile phones, laptops, and personal computers, which was essential for cadets who had different levels of access to technology. These findings aligned with previous research by Ratnaningsih et al., (2025), Khalaf (2019), and Atsari (2020) who emphasized the importance of incorporating technology in learning activities. The clean interface and functional design, as illustrated in Figure 2 (Main Menu) and Figure 3 (Syllabus Menu), allowed users to easily navigate through key learning components: Syllabus, Lesson, Practice, and References.

The Use Case Diagram (Figure 1) and the description in Table 1 effectively demonstrated the interaction between the two primary users—lecturers and cadets. These users were empowered to engage actively with the material, access structured content, and complete evaluations in a guided yet flexible environment. The trigger-based navigation (e.g., selecting a menu, starting a lesson, or returning to the home page) simulated user-friendly web application behavior, reducing cognitive load and enhancing usability.

Furthermore, the system integrated multimedia elements such as PowerPoint slides, instructional videos, and interactive exercises. These features not only catered to diverse

learning styles (visual, auditory, kinesthetic) but also simulated real maritime scenarios. This aspect was particularly crucial for Maritime English education, which emphasized communicative competence in practical, real-world settings.

At the time of initial development, the application contained content from the tenth meeting of the Maritime English course. However, the long-term vision aimed to expand the material to cover semesters one through four, reflecting both scalability and a commitment to curriculum continuity. This phased implementation allowed for user feedback and continuous improvement. The application's contextual navigation also mirrored classroom sequences—from accessing the syllabus to exploring lessons, completing exercises, and consulting references. This logical structure aligned with experiential learning theories and encouraged autonomous learning—an essential trait for maritime professionals operating in dynamic, multicultural environments. Additionally, the inclusion of exception-handling features, as detailed in Table 1, demonstrated that the system had considered potential usability challenges—an important factor in educational software development. In addition to system design and functionality, the study also examined cadets' perceptions of the DyMarE application, as presented in Table 2. The findings revealed that cadets held highly positive perceptions after using the application. Feedback was collected from a sample of 50 cadets through a questionnaire consisting of five core indicators: application interest, material understanding, ease of use, alignment with the syllabus, and improvement of Maritime English skills. A significant majority—80%—of cadets found the application interesting, suggesting that the interface design, interactivity, and content delivery successfully captured users' attention. Additionally, 90% of cadets reported that DyMarE helped them better understand the material, indicating the effectiveness of its instructional design and multimedia integration, especially given the technical nature of Maritime English. Remarkably, 100% of cadets strongly agreed that the application was easy to use, which highlighted the intuitive navigation and user-friendly interface developed with Bootstrap. An accessible application helped eliminate learning barriers and enabled cadets to focus on content rather than on platform usage difficulties.

Moreover, 80% of cadets stated that the material in DyMarE was well-aligned with the syllabus, underscoring its effectiveness in supporting the official curriculum. This finding echoed the results of similar studies by (Tang, 2022) and Suman (2023), which also confirmed that well-integrated digital tools enhance content delivery and learning consistency. Finally, 96% of cadets agreed that the DyMarE application significantly improved their Maritime English skills. This response validated the application's core objective of strengthening communicative competence in maritime contexts and demonstrated that DyMarE functioned not only as a digital repository of learning content but also as a practical, skill-enhancing educational tool.

CONCLUSION

The DyMarE application serves as an innovative and adaptive solution to support Maritime English instruction at Surabaya Maritime Polytechnic. It enhances traditional learning with digital support, encourages autonomous and interactive learning, and aligns with the global demands of maritime communication competency. The positive feedback from cadets suggests that the DyMarE application effectively meets both pedagogical and technological expectations in maritime education. The favorable results across all indicators, combined with statistical validation through SPSS analysis, demonstrate that DyMarE is a well-received, relevant, and impactful tool in supporting the development of Maritime English competencies. For lecturers, this finding implies the importance of integrating technology-based tools like DyMarE into

teaching strategies to create more engaging and authentic learning experiences. For polytechnic cadets, the application fosters self-directed learning, improves communication skills through real-world maritime scenarios, and prepares them to meet international standards of competence. For future research, further development should focus on completing the content, integrating user feedback, and adding analytics features to monitor learning progress, ensuring the system remains relevant, effective, and learner-centered. Additionally, expanding the research to other maritime institutions or including comparative studies with traditional teaching methods can provide broader insights into the effectiveness and scalability of DyMarE in diverse learning environments**.**

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