

Design of Mobile Web-Based Learning Media

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Abstract

The rapid advancement of digital technology has transformed educational practices, demanding innovative and accessible learning solutions, particularly in vocational maritime education. This study aims to design, validate, and evaluate the effectiveness of mobile web-based learning media for Maritime English subjects at Barombong Shipping Polytechnic. The development followed the ADDIE model (Analyze, Design, Develop, Implement, Evaluate), utilizing Glide Apps as the primary platform and Google Sheets as the backend database. Data were collected through questionnaires distributed to 28 cadets and 8 lecturers, measuring aspects of effectiveness, practicality, validity, and learning motivation using a 4-point Likert scale. The results showed that the learning media achieved an overall effectiveness score of 89.5% from cadets, with an average score of 3.58 out of 4.0, categorized as very effective. Lecturers' validity assessments indicated that the media met validity criteria, particularly in cross-platform compatibility, which scored the highest at 4.0. Practicality evaluations revealed that 8 out of 10 indicators fell into the highly valid category, especially in ease of access, navigation, and user satisfaction. The study concludes that the mobile web-based learning media is valid, practical, and effective in supporting English learning. However, aspects such as learning independence, focus, and speaking skill encouragement require further improvement. A blended learning approach combining digital media with direct teacher interaction is recommended to optimize learning outcomes.

INTRODUCTION

In today's digital era, technology has brought about major transformations in various sectors, one of which is the education sector (Aithal & Maiya, 2023; Akour & Alenezi, 2022; Lubis et al., 2022; Pasi & Dhamak, 2025; Wang et al., 2024). One of the most important innovations in education is online learning, which leverages digital platforms to access, deliver, and manage learning materials. Online learning, both desktop and mobile application-based, makes it easy for students and teachers to interact and collaborate without space and time limitations (Maruf et al., 2022; Shou, 2022; Shurygin et al., 2024; Yang et al., 2025). Mobile web-based online learning is becoming an increasingly popular choice due to the flexibility and accessibility it offers, allowing users to learn more efficiently anywhere and anytime (Alsarayreh, 2026; Evanick Ed. D, 2024).

The Barombong Shipping Polytechnic continues to strive to realize its visions and missions, where one of its missions states: "Improving education and learning governance, institutional governance, resource governance and financial governance based on information

and communication technology that is transparent, accountable and leading". This mission should be addressed by the academic community, especially lecturers and education staff, namely by consciously carrying out efforts to create a digital-based academic atmosphere.

The Minister of Transportation of the Republic of Indonesia in his instruction Number 8 of 2024 concerning Reform of Student Parenting Patterns in the Ringgi Institution Environment of the Ministry of Transportation instructed about fundamental changes to the curriculum that are adjusted to the needs of employment in the form of digitalization. Then since the COVID 19 period, online learning has been familiar to be carried out by the world of education, both synchronously and asynchronously (Alzahrani et al., 2023; Dargahi et al., 2023; Fernandez et al., 2022; Mao et al., 2023).

One of the main reasons why online learning is increasingly important is the ease of access and flexibility it offers. In the digital age, almost everyone has access to a mobile device such as a smartphone or tablet that can connect to the internet. Web-based mobile learning applications allow learners to access learning materials anytime and anywhere, without having to be tied to a specific time and place. This gives learners the freedom to learn at their own pace, adjust their study time with other activities, as well as access materials that may be difficult to obtain in a traditional classroom (Baig & Yadegaridehkordi, 2023; Ebbini, 2023; Nguyen et al., 2022; Yeh & Tsai, 2022).

This flexibility advantage is especially useful for a wide range of groups, from school learners to professionals who want to continue their education (Christabel & Prawira, 2023). Online learning allows learning to be more personalized, where learners can choose the time and method that best suits their learning style. With a learning application based E-Mail, access to materials can be done practically through the devices that are always available at their hands.

Online learning allows learners to access a variety of learning resources that were previously unreachable, be it articles, learning videos, interactive quizzes, or other materials. In the context of learning-based learning E-Mail, this is made easier because learners can access learning materials from a variety of platforms, including international educational resources that are not limited to physical classrooms. Learning becomes more varied with the use of various media, such as texts, videos, infographics, and interactive learning applications that can stimulate various types of students' intelligence (Christabel & Prawira, 2023).

Additionally, online learning can accommodate more specific learning needs, such as courses or training in specific areas, that are not always available at traditional educational institutions. Through the mobile web application, learners can take international courses, earn certificates, or deepen their knowledge beyond the formal curriculum.

Online learning also supports wider interaction and collaboration between students, teachers, and fellow students. In online learning, discussion and collaboration are not limited to a specific classroom or schedule. A web-based mobile learning application can provide features such as learning schedules, teaching materials of various teaching formats, syllabus, formative tests, and summative tests, announcements, and others. This improves communication between related parties in the learning process and creates a more inclusive learning community.

In addition, these collaboration features facilitate team-based learning and the development of much-needed social skills in the professional world. Students can learn to

work together in groups even though they are separated by physical distance. This of course increases the effectiveness of learning by providing opportunities for learners to exchange ideas and understanding, as well as build a wider network.

Interactive learning involving teachers and students can be realized through digital learning media. Students' motivation to learn will increase and boredom during lessons will be overcome if the digital media used in classroom learning is chosen appropriately."

In terms of management, digital learning also provides significant efficiency for both teachers and educational institutions. A web-based mobile learning application can provide various tools to monitor student progress, such as recording exam results, collecting assignments, or faster feedback. This allows teachers to more easily evaluate learners' progress without having to involve a time-consuming manual process. This data-driven learning also allows teachers to identify areas that need improvement and make more effective adjustments to learning materials. For educational institutions, digital learning offers a solution to manage a large number of learners and a more efficient distribution of materials. With the right platform, all information about learning activities including schedules, materials, and grades—can be more easily managed and organized.

Online learning in the digital era also prepares students and teachers to face the challenges of future education. Education in the 21st century demands not only knowledge, but also digital skills and the ability to adapt to new technologies. Online learning is a very effective means to grow students' digital skills, from operating digital devices to collaborating virtually. In addition, mobile web-based learning also supports the application of various innovative learning methods, such as project-based learning, gamification-based learning, and the use of artificial intelligence (AI) in presenting more relevant and personalized materials.

Online learning prepares learners with the skills needed to compete in an increasingly digital global market. Technology allows learners to learn in a more flexible and dynamic way, which will be useful in their careers and lives in the future.

The concept of mobile web refers to web applications that are designed to be accessible through mobile devices, such as smartphones and tablets, using web browsers, without the need for separate application installation. In the context of learning, the mobile web offers a number of advantages that can change the way we interact with educational materials and significantly improve the learning experience.

Mobile web is a platform that allows users to access web-based sites or applications through mobile devices using browsers such as Google Chrome, Safari, or Firefox. Unlike native apps that require installation on your device, web-based mobile apps don't require a download or installation process from an app store (such as Google Play or App Store). Instead, users simply access the predefined URL through the browser on their device. The platform is designed to perform and function optimally on mobile devices, with a responsive interface that adjusts the display according to the screen size of the device used.

Application E-Mail Usually built using technology Web standards such as HTML5, CSS, and JavaScript, which allow developers to create applications that can run on different types of devices with different operating systems, such as Android, iOS, or Windows (Yosanny & Halim, 2013). Because of its nature-based Web, E-Mail offers ease in terms of updates and maintenance. Users don't need to download the latest version because updates are done automatically on the server side.

Key advantages of application-based E-Mail is its ability to be accessed by almost any mobile device connected to the internet, without worrying about the type of operating system or the specific device model (Tofani et al., 2024). Students who use smartphones, tablets, or even simpler devices, can access learning materials without a hitch. In other words, the app E-Mail Make learning more inclusive because it is accessible to a wide range of groups, including those with limited devices or operating systems.

Additionally, because web-based apps only require a browser for access, students don't need to download apps or manually update the latest versions, making it easier for them to stay connected to learning materials continuously.

E-mail provides high flexibility in the learning process. Students don't need to be in a specific location, such as a classroom, to access the material. Simply with an internet connection and a mobile device, students can access the material anytime and anywhere. This is especially beneficial for students with busy schedules, those who live in remote areas, or who have physical limitations to attend traditional classes (Wardana, 2016).

This flexible learning allows students to learn according to the pace and time they have. For example, a student can study while traveling, while waiting, or in other free time. Thus, mobile web applications support more independent learning and are in line with modern lifestyles that are fast-paced and dynamic.

Mobile web is designed to be responsive, which means that apps will adapt their appearance and functionality to the screen size of the device being used. This is important because mobile devices have a variety of screen sizes, from smartphones to tablets. The responsive interface allows users to access learning materials with an optimal view, without the need to zoom in or out to read text or view images.

Users also don't need to worry about hardware specifications, as mobile web-based applications can run on devices with lower capacity, provided they have an adequate internet connection. This makes the web mobile app more accessible to many people with different levels of device capabilities.

Another advantage of mobile web is the ease of updating or changing learning materials. Material updates or the addition of new features can be done directly on the server side without the need to change or update the application on each user's device. This means students can always access the most up-to-date learning materials without having to download or reinstall the app.

Additionally, app developers can manage and update content more efficiently, without having to worry about outdated versions of apps or compatibility issues between different types of devices. It also allows for teaching that is more responsive to changing needs or the latest developments in the material being studied.

With the mobile web, the data used in the app can be stored on a central server instead of on the user's device. This allows for more efficient and centralized data management. Users don't have to worry about local storage on devices that are limited in capacity. Additionally, student learning data and progress can be easily tracked and managed on the server, allowing teachers to monitor student progress in real-time.

Centralized data storage also reduces the risk of data loss that may occur on the user's device. If there are technical issues with a student's device, the learning data remains safe and can be accessed again on another device.

Web mobile app development tends to be more cost-effective compared to native apps that need to be created separately for each platform (e.g. Android and iOS). Since mobile web applications can be accessed on various devices and operating systems using a single set of base code, developers only need to manage and update one application. This reduces application development and maintenance costs, which can be diverted to improve the quality of learning content or add useful new features.

This study addresses three main problem formulations. First, what are the primary needs in designing mobile web-based online learning applications? Second, how can an application be designed to improve user experience in online learning? Third, is mobile web-based learning media valid and effective to use?

The objectives of this study are threefold: to design an efficient, interactive, and accessible mobile web-based online learning application; to determine the key features required in such an application; and to ascertain whether mobile web-based learning media is valid and effective for use.

RESEARCH METHOD

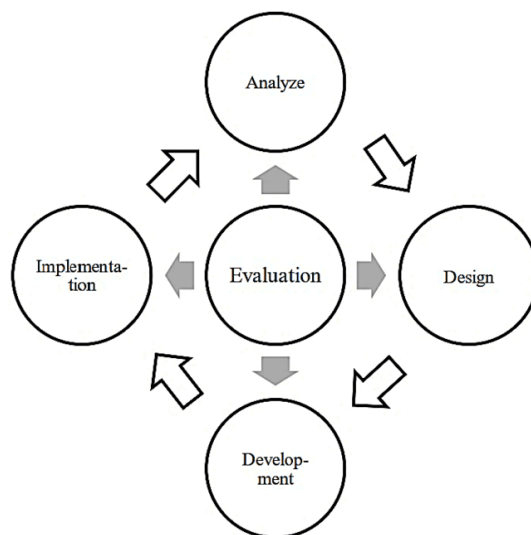


Figure 1 ADDIE model system design

Research Location

The research was carried out at the Barombong Shipping Polytechnic

Subject Designed: Maritime English

Research Subject: Cadet of DP-III Program

Research Design:

The following is the design of a mobile web-based learning media design using Glide Apps with an ADDIE model approach:

Analysis

Objectives:

- Identify mobile web-based learning needs.
- Analyze the characteristics of users (lecturers and cadets).
- Determine appropriate material to develop in Glide Apps.

Analysis Results:

- Target user: DP-III Program Cadets
- Subjects: Information Technology and English
- Needs: Mobile web-based learning media with quizzes, visual materials, and formative tests.

Design

Application Structure:

- Home: Main view with navigation to materials, quizzes, discussion forums, and user profiles.
- Learning Materials: Pages contain summaries of material in the form of text, videos, and infographics.
- Interactive Quiz: Practice multiple-choice-based questions with live feedback.
- Discussion Forum: A feature of comments and questions and answers between students and teachers.
- Learning Progress Report

Navigation Flow:

1. Choose the material you want to study.
2. Perform assigned Tasks
3. Take the quiz after studying the material.
4. Monitor your learning progress on your profile page.

Tools Used:

- Glide Apps to build *mobile web*.
- Google Sheets as a database to store materials, quizzes, and users.

Development

Development Steps:

1. Create a database in Google Sheets that contains:
 - List of learning materials.
 - Quiz questions and answers.
 - User progress data (name, email, quiz score).
2. Designing UI Glide Apps:
 - Using the Cards, List, Form, and Button components.
 - Customize colors and icons to make them attractive and responsive.
3. Integrate quiz features with automated feedback.
4. Provide comments in Glide Chat-based discussion forums.
5. Test the application internally before implementation.

Implementation

- Share the application link to students via WhatsApp/Email.
- Provide guidance on how to use the app.
- Monitor user response and experience for 1-2 weeks.

Evaluation

Formative Evaluation:

- Analyze usage data from Glide Analytics.
- Collect feedback from students and teachers through Google Forms.

Summative Evaluation:

- Conduct an effectiveness test by comparing learning outcomes before and after using the application.
- Fixed less effective features based on evaluation results.

With the ADDIE model, Glide Apps-based learning media can be developed systematically and effectively to support interactive and accessible digital learning.

Data Collection Techniques

Literature Studies

Collect data from journals, books, and previous research on *web-based mobile* learning media, ADDIE models, and the use of Glide Apps.

Objective: To strengthen the theoretical and conceptual foundations of learning media development.

Observations

Observing how cadets and lecturers use learning media based on Glide Apps.

Data collected:

How cadets access and use application features.

Technical or usage problems that arise.

Questionnaire

It was used to collect responses from cadets and lecturers regarding the effectiveness of the application.

Question type:

The Likert Scale (e.g.: strongly agree - strongly disagree) to assess ease of use, display, and learning effectiveness.

Multiple choice to find out the most used features.

Fields are open for input and suggestions.

Interview

It was done with lecturers and several cadets to get deeper insight into their experience using the application.

Data obtained:

Advantages and disadvantages of the application.

How effective is the application in improving cadets' understanding.

Suggestions for further development.

RESULTS AND DISCUSSION

Mobile-web-Based *Learning Media Design*, case study: Maritime English Course

The design of mobile-web-based learning media in English learning case studies is designed to answer the needs of learning flexibility and accessibility for cadets, especially in the context of shipping vocational education. This media integrates various learning formats, namely videos, PowerPoint (PPT), and PDF documents, which are strategically selected to support an effective, engaging, and interactive learning process.

Display of Learning Media on Cellphones:

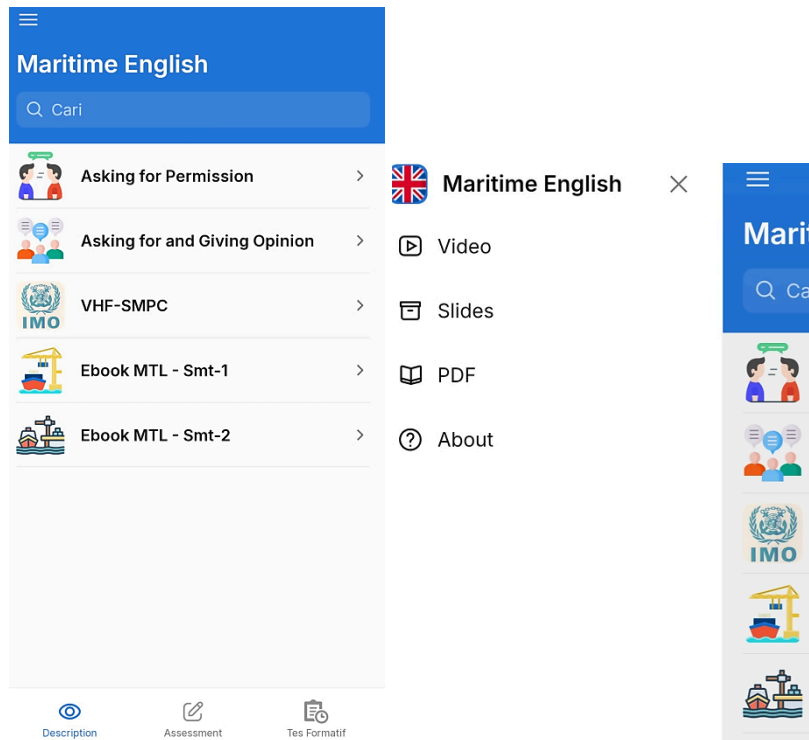


Figure 2 Display of learning media applications on cell phones

The video format is used to convey material visually and auditorily, allowing cadets to understand the pronunciation, intonation, and context of English communication directly.

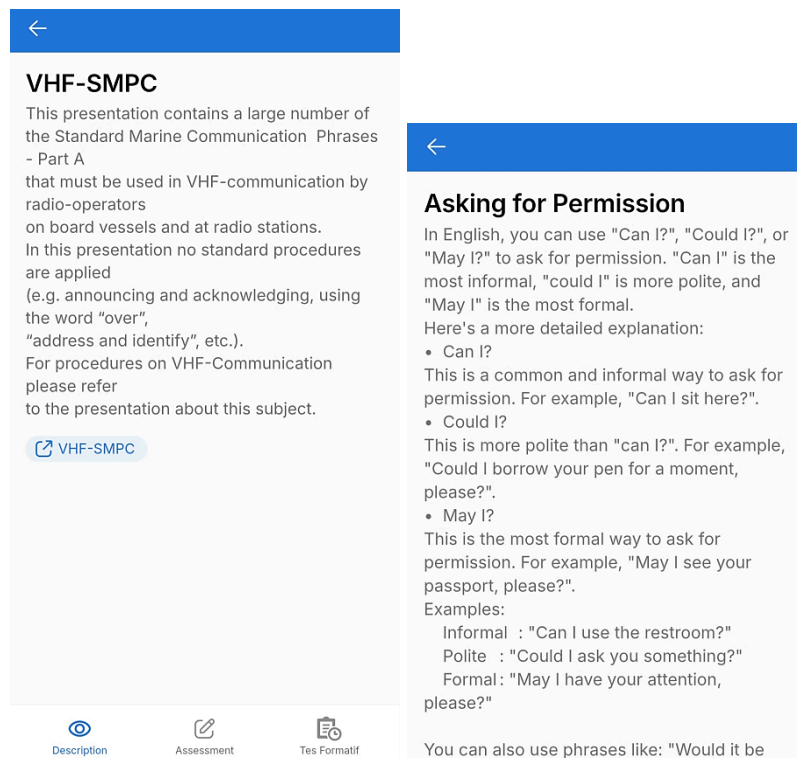


Figure 3 Learning content description view

PowerPoint material (PPT) is used as a means of conveying important points in the form of concise and systematic slides, supporting visual explanation of theory and vocabulary. Meanwhile, PDF documents are provided as self-paced reading and reference materials, such as material summaries, practice questions, and assignment instructions, which can be accessed at any time and downloaded for offline learning.

By taking a mobile-web-based approach, this media can be accessed through various devices, especially smartphones, without having to download additional applications. This makes the English learning process more flexible, efficient, and in accordance with the learning needs of today's digital generation.

The design of mobile-web-based learning media in English learning case studies is carried out systematically and based on user needs. The design process begins with an analysis of content needs involving interviews and discussions with English course lecturers, to ensure that the material presented is really relevant to the learning needs of cadets in the shipping vocational environment.

The results of the analysis show that there are a number of English communication competencies that need to be prioritized in media development, namely "Asking for Permission", "Asking for and Giving Opinion" materials, as well as marine standard communication based on VHF and SMCP (Standard Marine Communication Phrases). In addition, to support the linkage between language and the context of the study program's expertise, this media also contains specific materials related to Marine Transportation Management (MTL), such as technical terms in shipping operations, maritime logistics communication, and port documentation.

This media is developed in the format of learning videos, PowerPoint slides that can be accessed online, and PDF documents that can be downloaded and used as self-study materials. All content is integrated in a mobile-web platform, so it can be easily accessed through mobile devices or computers, without the need for additional application installation. With this approach, it is hoped that English learning will become more contextual, flexible, and support the achievement of cadets' professional competencies optimally.

The design of mobile-web-based learning applications for English subjects is a form of innovation in the development of learning media that is responsive to the needs of the times. This application was developed by carrying the principles of flexibility, accessibility, and relevance of content to actual learning practices in vocational education institutions, especially in the context of shipping education. The main purpose of this design is to provide English learning facilities that are easily accessible to cadets through mobile devices, as well as to support the independent learning process that is adaptive to technological developments.

In the initial stages of design, the development team conducted a needs analysis through discussions and interviews with English lecturers. The results of the process are used as the basis for compiling the content structure and features that will be included in the application. Although the content is compiled based on input from lecturers, it should be noted that the arrangement of content in the application has not fully referred systematically to the Semester Learning Plan (RPS) in each semester. This is because the approach used emphasizes more on popular issues and practical needs faced by cadets in real situations, rather than simply following a formal curriculum structure. In other words, this media is more complementary to formal learning in the classroom, and is not intended as a substitute for the applicable syllabus

or RPS. The content is arranged in a modular and contextual manner, so that it can be used flexibly by lecturers and cadets as needed.

The app is developed in a mobile-web format with a simple and intuitive interface. Learning content is presented through three main formats: learning videos, interactive PowerPoint slides, and downloadable PDF documents. Videos are used to help cadets understand the pronunciation, intonation, and context of dialogue in English; PowerPoint slides serve to present key concepts in easy-to-understand visual form; while PDFs are used as additional references and exercises.

By using a web-based platform, this application can be accessed through mobile devices or computers without the need for additional application installation. This allows learning to be done flexibly anytime and anywhere. In the future, further development will be directed to align the content with RPS in each semester, so that this media can be used more comprehensively in a structured learning system.

Effectiveness of Mobile-web-based learning media

The measurement of the effectiveness of mobile-web-based learning media in English learning case studies was carried out through the distribution of questionnaires to 28 cadets who had used the media during several meetings. The questionnaire is compiled in 10 statements that measure various aspects of effectiveness, such as ease of access, clarity of material, learning engagement, flexibility of time, and its impact on understanding English material.

Each statement item in the questionnaire was measured using a 4-point Likert scale, with a score range of 1 (disagree) to 4 (strongly agree). Based on the results of data processing, a total percentage of 89.5% was obtained, which shows that the majority of cadets stated that this learning media was effective in supporting the English learning process. If averaged, the effectiveness score of this media reaches 3.58 out of a maximum score of 4, which falls into the category of very effective.

Device to access learning media:

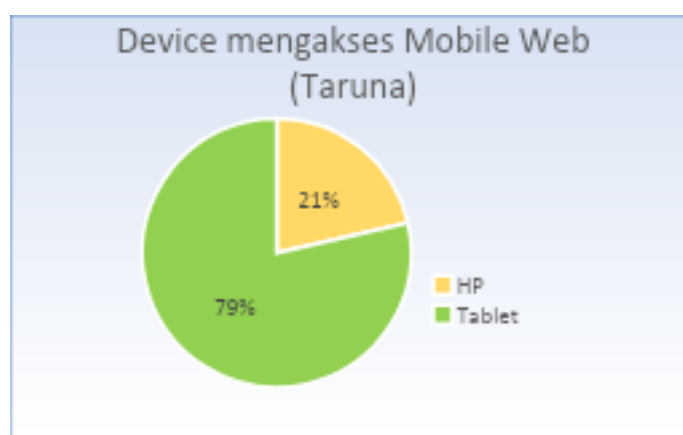


Figure 4 Device Usage Distribution Among Digital Audience

These results show that the designed mobile-web-based learning media has been able to answer the cadets' needs for learning media that is flexible, easy to use, and in accordance with the characteristics of the current digital generation. The majority of respondents gave

positive ratings to the interactive features, simple interface appearance, and content presented in video, slide, and PDF document formats. In addition, the flexibility of access through mobile devices is also an added value that encourages independent learning engagement outside of class hours.

With the achievement of this score, it can be concluded that mobile-web-based learning media has high potential to be implemented more widely, as well as being a material for evaluating and developing learning media that is more integrated with the curriculum in the future.

The following are the results of a questionnaire of 8 lecturers who provided answers to 10 questionnaires about the effectiveness of mobile web-based learning media.

Table 1. results of the learning media effectiveness questionnaire on lecturers

No	Indicator	Average	Categories
1	Ease of access to learning media	3,7	Highly Valid
2	Learning media features are easy to understand	3,5	Valid
3	Easy to collect tasks	3,7	Highly Valid
4	Helps learn independently and structured	3,7	Highly Valid
5	More focused on learning when using this learning media	3,5	Valid
6	Web mobile <i>learning media</i> is more effective compared to printed books	3,4	Valid
7	The appearance of this learning media is easy to understand and use	3,2	Valid
8	Easy to use navigation between pages	3,7	Highly Valid
9	The design looks professional and comfortable to use	3,7	Highly Valid
10	Overall, cadets feel satisfied in the use of this learning media	3,7	Highly Valid

Source: Questionnaire survey of 8 lecturers (n=8), 4-point Likert scale, conducted at Barombong Shipping Polytechnic, 2024.

From the results of the questionnaire given to 8 lecturers, *the mobile-web-based learning media* showed a high level of effectiveness, with an average score on each indicator ranging from 3.2 to 3.7. Most of the indicators are in the Very Valid and Valid category, indicating that the media is quite effective in using them in the learning process.

A total of **5 indicators obtained the Very Valid category**, namely:

- Indicator 1: *Ease of access to learning media* (average 3.7),
- Indicator 3: *Easy to collect tasks* (3,7),
- Indicator 4: *Helps learn independently and structured* (3,7),
- Indicator 8: *Easy-to-use navigation between pages* (3.7),
- Indicator 10: *Overall, cadets felt satisfied with the use of this media* (3,7).

The five indicators illustrate that from the user side, this media has met expectations in terms of accessibility, ease of use, and learning experiences that support independence and order.

Meanwhile, there are **5 other indicators that are included in the Valid category**, including:

- Indicator 2: *Learning media features are easy to understand* (3,5),
- Indicator 5: *More focused on learning when using this medium* (3,5),
- Indicator 6: *Mobile-web media is more effective than print books* (3,4),
- Indicator 7: *Media display is easy to understand and use* (3,2),
- Indicator 9: *The design looks professional and comfortable to use* (3,7).

Although still in the valid category, some aspects such as the effectiveness of printed books and media displays can still be improved, for example through improvements to the user interface, color selection, or more intuitive and visually appealing layout settings.

In general, the results of this analysis show that mobile-web-based learning media has provided an effective learning experience for cadets, especially in supporting access, assignments, navigation, and learning satisfaction. However, there is room for improvement in the visual design aspects and learning features so that the appeal and usability of the media will be more optimal in the future.

The following are the results of a questionnaire of 28 cadets who provided answers to 10 questionnaires about the practicality of mobile web-based learning media.

Table 2. Results of the questionnaire on the practicality of learning media in cadets

No	Indicator	Average	Categories
1	Ease of access to learning media	3,8	Highly Valid
2	Learning media features are easy to understand	3,6	Highly Valid
3	Easy to collect tasks	3,8	Highly Valid
4	Helps learn independently and structured	3,2	Valid
5	More focused on learning when using this learning media	3,2	Valid
6	Web mobile <i>learning media</i> is more effective compared to printed books	3,6	Highly Valid
7	The appearance of this learning media is easy to understand and use	3,8	Highly Valid
8	Easy to use navigation between pages	3,7	Highly Valid
9	The design looks professional and comfortable to use	3,7	Highly Valid
10	Overall, cadets feel satisfied in the use of this learning media	3,7	Highly Valid

Source: Questionnaire survey of 28 cadets (n=28), 4-point Likert scale, conducted at Barombong Shipping Polytechnic, 2024

Based on the results of a questionnaire given to 28 cadets regarding the practicality of mobile web-based learning media, an average score was obtained on ten indicators with a value range of 3.2 to 3.8. In general, these results show that the learning media developed is included in the Very Valid category, so it can be said to be practical and feasible to use in the learning process.

Indicators with Highly Valid Categories

A total of 8 indicators are in the Very Valid category, namely:

1. *Ease of access to learning media* (3,8),
2. *Media features are easy to understand* (3,6),
3. *Easy to collect tasks* (3,8),
4. *mobile web media is more effective than printed books* (3,6),
5. *The media display is easy to understand and use* (3,8),
6. *Easy-to-use navigation between pages* (3,7),
7. *The design looks professional and comfortable to use* (3,7),
8. *Overall, cadets felt satisfied with the use of this media* (3,7).

These results show that the media has met the practicality aspects in terms of accessibility, ease of use, visual appearance, navigation, and overall user satisfaction. The indicator of ease of access and ease of collecting assignments even obtained the highest score (3.8), indicating that this application really helps cadets in their daily learning activities.

Indicators with Valid Categories

The **2 indicators** are still in the **Valid category**, namely:

- *Helps learn independently and in a structured manner* (3,2),
- *More focused on learning when using this media* (3,2).

This value shows that even though the media can be used well, there is still room for improvement so that the media is better able to encourage cadets to learn independently and increase focus on learning.

Interpretation of Results

Overall, the results of the questionnaire show that mobile web-based learning media has been practically used and well received by cadets. The high scores on the accessibility, navigation, and display indicators prove that this media has supported the needs of learning that is flexible, simple, and in accordance with technological developments.

However, aspects related to learning independence and focus on learning are still relatively low. This can be overcome by adding multimedia features, such as pronunciation in English or more varied multimedia integration to encourage cadets to be more understanding and skilled in learning.

With the results of the majority of indicators in the Very Valid category, it can be concluded that mobile web-based learning media is very practical to use in learning English. This media is not only easy to access and use, but also provides high satisfaction for cadets, so it is worthy of continuing to be developed and implemented in the learning process.

Table 3. Results of the cadets motivation questionnaire in learning using learning media

No	Indicator	Average	Categories
1	Cadets are motivated to learn by using this learning media	3,2	Valid
2	Cadets are more enthusiastic about learning by using learning media	3,2	Valid
3	Cadets are more interested in learning by using this learning media	3,5	Valid

No	Indicator	Average	Categories
4	With this learning medium, it helps to learn anywhere and anytime	3,2	Valid
5	Assessment and Tests are formative and make cadets encouraged to do tasks on time	3,2	Valid

Source: Questionnaire survey of 28 cadets (n=28), 4-point Likert scale, conducted at Barombong Shipping Polytechnic, 2024.

Based on the results of the analysis of questionnaire data given to cadets, an overview of their perception of the use of mobile-web-based learning media was obtained. There were five indicators measured in this questionnaire, with average scores ranging from 3.2 to 3.5 on the assessment scale, and all indicators categorized as valid.

The first indicator, namely *"Cadets are motivated to learn using this learning medium"*, obtained an average score of 3.2. This shows that learning media provides a good enough motivation for cadets to learn. This is strengthened by the second indicator which states that *"Cadets are more enthusiastic about learning by using learning media"*, which also gets an average score of 3.2. Both reflect that this media is able to foster enthusiasm and motivation to learn at a consistent level.

The third indicator, *"Cadets are more interested in learning by using this learning medium"*, obtained the highest score of 3.5. This score shows that the attractiveness of learning media is the dominant factor that has a positive influence on the learning experience of cadets. This indicates that visual, interactive, and easy-to-access aspects are most likely to be the advantages of these media.

Meanwhile, the fourth indicator, *"With this learning medium, it helps to learn anywhere and anytime"*, also received an average score of 3.2. This indicates that the flexibility offered by mobile-web-based learning media has been utilized by cadets, although it may not be fully optimal.

Finally, the fifth indicator regarding *"Assessment and formative tests make cadets motivated to do tasks on time"*, also has an average score of 3.2. This shows that the existence of evaluation and assignment features in learning media also plays a role in disciplining cadets to complete tasks on time.

Overall, the results of this questionnaire show that *the mobile-web-based learning media* used is classified as effective and valid, with a fairly high average score across all indicators. However, although the cadets' responses showed a positive attitude, further development on the aspects of interactivity, visualization, and direct involvement of teachers can strengthen the effectiveness of these media in supporting the learning process.

The implementation of mobile-web-based learning media in English learning provides many benefits, especially in terms of ease of access, flexibility of learning time, and the availability of materials in various formats such as videos, PowerPoint, and PDF documents. This media is designed to support the independent learning process, providing opportunities for cadets to repeat the material freely according to their respective learning speeds and styles. Based on the results of the evaluation and questionnaire, most of the cadets stated that this media was effective and helpful in understanding English material, especially for topics that are practical and oriented to the maritime context.

However, even though the use of mobile-web-based media is considered positive, most of the cadets still expressed their hope that teachers will remain physically present in class. They consider that the direct presence of a teacher remains an important element in the learning process. Face-to-face interaction is considered to be able to create a more lively learning atmosphere, provide emotional motivation for learning, and allow for direct and more spontaneous two-way discussions. In addition, direct explanations from lecturers are still felt to be easier to understand, especially for complex or abstract materials, such as sentence structure, pronunciation, and sentence use in formal contexts.

Cadets also hope that mobile-web-based learning media will not be the only learning method, but will be combined with other more interesting and varied methods, such as role-play, group discussions, radio communication simulations (especially for VHF and SMCP materials), and direct practice based on shipping contexts. With a blended learning approach, the learning process can run more dynamically and interactively, not only depending on the materials available in digital media. This expectation shows that while technology facilitates many aspects of learning, the presence of a teacher who attends and interacts in person remains completely irreplaceable.

Validity of Learning Media

A total of 8 lecturers responded to the questionnaire on the validity of learning media with the following details:

Table 4. Lecturers' perception of the validity of mobile web-based learning media

No	Indicator	Average	Categories
1	This learning media is easily linked with online media Youtube, Google Drive, and Google Form	3,75	Highly Valid
2	The material in the learning media content is relevant to the learning material	3,5	Valid
3	This learning media supports active and independent learning	3,4	Valid
4	Assessment according to the material taught	3,6	Highly Valid
5	The tasks given encourage speaking skills	3,4	Valid
6	The media display is attractive and suitable for cadets	3,6	Highly Valid
7	Neatly arranged and easy to read layout	3,6	Highly Valid
8	Font size and font are easy to read on a mobile phone/tablet	3,6	Highly Valid
9	All learning content formats can be loaded on HP/Tablet	3,2	Valid
10	Learning media already supports cross-platform (Windows / Android / iOS)	4	Highly Valid

Source: Questionnaire survey of 8 lecturers (n=8), 4-point Likert scale, conducted at Barombong Shipping Polytechnic, 2024.

Based on the results of questionnaire data processing involving 8 lecturers, mobile-web-based learning media is generally considered valid and suitable for use in the learning process. There are 10 indicators measured to assess the validity aspect of the media, with an average score ranging from 3.2 to 4.0.

The indicator with the highest score is the 10th indicator which states that *the learning media already supports cross-platform (Windows / Android / iOS)*, obtained an average of 4.0 and is included in the Very Valid category. This shows that the media has been designed with high compatibility so that it can be widely accessed on various devices.

Five other indicators also received high scores and were categorized as **Very Valid**, namely:

- Indicator 1: *Media is easily linked with online media such as Youtube, Google Drive, and Google Form (3.75)*,
- Indicator 4: *Assessment according to the material taught (3,6)*,
- Indicator 6: *Attractive and cadet-appropriate media display (3.6)*,
- Indicator 7: *Neat and easy-to-read media layout (3,6)*,
- Indicator 8: *Font size and font are easy to read on a cellphone/tablet (3.6)*.

Meanwhile, several indicators get the **Valid category**, such as:

- Indicator 2: *Suitability of the material in the learning content (3.5)*,
- Indicator 3: *Support for active and independent learning (3,4)*,
- Indicator 5: *Task encourages speaking skills (3,4)*,
- Indicator 9: *All content formats can be loaded on the phone/tablet (3,2)*.

From this data, it can be concluded that mobile-web-based learning media has met the validity criteria, especially in terms of cross-platform compatibility, readability, ease of access, and display suitability. However, some aspects such as content format and encouragement of speaking skills still need to be improved to be more optimal in supporting the learning process of cadets. Recommendations from lecturers should be used as input in the process of developing and improving media in the future.

The presence of teachers also provides space for character and discipline development, which is very important in the world of vocational education such as shipping. Cadets consider that the role of lecturers is not only as a material presenter, but also as a guide, motivator, and facilitator in shaping professional attitudes in the academic and work environment.

Thus, these results are an important note for the further development of mobile-web-based learning media. This media still needs to be maintained as an effective and flexible learning aid, but it does not replace the main role of teachers. The combination of digital media and the in-person presence of teachers, coupled with other innovative learning methods, will create a more holistic, engaging, and significant learning ecosystem for improving the English proficiency of shipping cadets

CONCLUSION

This research concludes that the design of mobile web-based learning media for English subjects successfully addresses the key needs of online learning by providing easy access, a simple yet attractive interface, clear navigation, cross-platform compatibility, and essential features such as multimedia learning materials, assignment submission, online assessments, and external media integration. Using a user-centered design approach, the application was

developed with a professional and user-friendly appearance, while interactive elements such as formative tests and evaluations were shown to support independent and structured learning among cadets. Validation results from experts and lecturers categorized the media as valid in terms of content, appearance, and usability, and user trials demonstrated high levels of practicality, effectiveness, and ease of use. Overall, the developed mobile web-based learning media proved effective in supporting English learning and enhancing the online learning experience. Future research is recommended to explore the long-term impact of the application on students' English proficiency, integrate more advanced technologies such as artificial intelligence or adaptive learning systems, and test the media with broader and more diverse user groups to improve scalability and effectiveness.

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