

GAMIFIED LEARNING ON ESP MARITIME ENGLISH: A TEACHING FACTORY METHOD FOR ENHANCING CRITICAL READING SKILLS

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Abstract

This study investigates the integration of gamified learning into English for Specific Purposes (ESP) within Maritime English instruction and its role in improving students' critical reading skills through the Teaching Factory approach. Maritime students are required to understand technical documents, safety procedures, and operational texts; however, traditional reading instruction often reduces student motivation and participation. This study employed a qualitative case study design involving 20 sea transportation students who had completed internships at port industries. Data were collected through semi-structured interviews, classroom observations, Quizizz activity records, and document analysis. The findings revealed that gamified learning created a more engaging and interactive learning environment. Students showed higher participation and motivation during reading activities through quizzes, leaderboards, role-playing tasks, and real-time feedback. The implementation of gamification also improved students' comprehension of maritime texts and supported the development of critical thinking and problem-solving skills.

Furthermore, the Teaching Factory approach provided contextual learning experiences by connecting classroom activities with real maritime workplace situations. The study concludes that gamified learning can effectively enhance critical reading performance in ESP Maritime English instruction. Future studies are recommended to examine the long-term impact of gamification and compare various learning platforms such as Quizizz, Kahoot, and Baamboozle.

Keywords: *Gamified learning, Maritime English, Critical reading skills, Teaching Factory approach, ESP*

INTRODUCTION

The maritime industry is essential to global trade, transportation, and logistics, especially for the global economy, and needs highly skilled professionals who can adeptly manage regulatory, technical, and operational challenges. Reading comprehension, especially in English for Specific Purposes, is one of the essential skills for maritime professionals. Maritime English is the main language used for communication in international maritime operations that plays a crucial role in ensuring safety regulations are followed and helps foster effective collaboration among diverse crews from different countries (Gaffas, 2023; Li et al., 2023; Ridhwan et al., 2020; Wibowo et al., 2025). Considering the significant risks associated with maritime operations, it is essential to effectively understand technical manuals, navigational charts, maritime laws, and safety protocols. Misunderstanding these documents can result in navigation mistakes, operational challenges, and potentially serious accidents. Therefore, Nalupa (2022) stated that reading skills are fundamental to maritime students' professional readiness and competence.

Integrating students into marine English through critical reading is crucial, yet conventional teaching approaches have had difficulty in effectively engaging them. Traditional ESP teaching relies heavily on textbooks, passive learning, and repetitive memorization. This approach often leads students to struggle to participate in maritime reading (Grepon et al., 2022; Wibowo & Munir, 2024; Rahmawati & Ummah, 2020). Students frequently struggle to retain information and often do not develop the analytical skills needed to assess and apply technical nautical data (Sumarni & Salsabila, 2023). The situation has led to a search for innovative teaching methods designed to enhance students' critical thinking, comprehension, and engagement skills.

Gamified learning, which incorporates game-like elements such as challenges, leaderboards, points, and interactive tasks into educational experiences, is an effective approach (Chan et al., 2023; Weines, 2021). In the realm of language learning, integrating gamification has shown a remarkable capacity to boost motivation, increase cognitive engagement, and improve information retention (Mustofa & Indah, 2023; Christopoulos & Mystakidis, 2023). Gamification offers engaging and interactive learning experiences in English for Specific Purposes (ESP) within marine education, reflecting authentic maritime situations. Students participate in challenges, tests, and role-playing exercises rather than just reading technical texts, which encourages active involvement and deeper understanding (Ahmed et al., 2022; Zhou & Zhang, 2022).

In maritime English education, where safety, situational awareness, and rapid decision-making are essential, critical reading skills play a vital role in enabling students to interpret technical information accurately and respond appropriately to operational situations. In this study, critical reading is conceptualized as a higher-order reading process that extends beyond literal comprehension and involves the ability to infer implicit meanings, analyze information, evaluate the credibility and relevance of textual

content, interpret operational implications, and synthesize information from multiple sources to support decision-making (R. Rahman et al., 2019; Sole & Anggraeni, 2020). These dimensions are particularly important in maritime contexts, where learners are required to understand safety regulations, navigation procedures, cargo-handling instructions, and incident reports that often demand analytical judgment rather than simple information retrieval.

Although gamified learning has demonstrated positive effects on vocabulary acquisition, grammar learning, and general reading comprehension, empirical research examining its role in developing critical reading skills within Maritime English remains limited (Mayuni et al., 2020; Sari & Prasetyo, 2021). Existing studies have rarely investigated how gamification supports specific dimensions of critical reading, such as inference, analysis, evaluation, interpretation, and synthesis, when students engage with technical and profession-specific texts. Consequently, there is insufficient evidence regarding how gamified learning environments can facilitate the higher-order literacy skills required in maritime training.

Previous studies have demonstrated the effectiveness of gamification tools such as Quizizz and Kahoot in enhancing student engagement, motivation, vocabulary acquisition, and reading comprehension in English language learning contexts (Degirmenci, 2021; Ratnasari et al., 2019; Safriyani & Khasanah, 2021). Similarly, research on the Teaching Factory (TEFA) approach has highlighted its potential to connect classroom learning with authentic workplace practices, thereby improving vocational competencies and industry readiness (Fatmawati et al., 2023). In the field of Maritime English, previous studies have primarily focused on curriculum development, vocabulary instruction, language needs analysis, and the integration of workplace-oriented learning experiences (Iryanti et al., 2024; Licorish et al., 2018; Wibowo et al., 2025).

Despite these contributions, little is known about how gamified learning and the Teaching Factory approach can be integrated within ESP Maritime English instruction to support students' critical reading development. Existing studies have generally examined gamification or workplace-based learning separately, with limited attention to their combined application in maritime education. Furthermore, while student engagement and motivation have been widely investigated, there remains a lack of research on how gamification and authentic workplace learning influence critical reading skills, which are essential for interpreting technical documents, safety regulations, and operational procedures in maritime settings.

To address this gap, the present study investigates the implementation of Quizizz-based gamified learning within a Teaching Factory framework in Maritime English classes. Specifically, the study examines how this integrated approach influences students' engagement, motivation, and critical reading skills in authentic maritime learning contexts. By combining gamification with workplace-oriented ESP instruction, this study extends current research on Maritime English pedagogical evidence on how technology-enhanced learning can support both language development and professional readiness in maritime education.

This study aimed to examine the integration of Quizizz-based gamified learning within the Teaching Factory approach in Maritime English instruction. Specifically, this study aims to explore students' perceptions of the integrated approach, investigate its influence on student engagement and motivation, and examine its role in supporting the development of critical reading skills, including inference, analysis, interpretation, and evaluation of maritime texts in authentic maritime learning contexts.

METHOD

This study employs a qualitative method with quantitative data to explore students' experiences with gamified reading, their engagement, and their perspectives to evaluate

the Teaching Factory method and Quizizz gamified learning to evaluate their impact on improving critical reading skills in English for Specific Purposes

Respondents

The participants of this study were 20 ESP sea transportation students who had completed internships at port industries. The students were selected based on their different educational backgrounds and English proficiency levels. The participants were involved in maritime English learning activities integrated with gamified learning and the Teaching Factory approach. Purposive sampling was used because the participants possessed relevant experience and exposure to maritime English learning contexts suitable for the objectives of this study (Creswell, 2018).

Table 1. Participant Demographic Characteristics

Characteristic	Description
Number of Participants	20 students
Program of Study	Sea Transportation (Maritime Program)
Age Range	20-22 years
Semester Level	7th semester
Internship Experience	Completed 6–12 months of internship at port or shipping industries
Prior English Proficiency	425-500 TOEFL Score based on institutional English placement test results
Learning Context	Maritime English courses integrated with Gamified Learning and Teaching Factory approaches

Instruments

This study employed multiple instruments to collect qualitative data, including semi-structured interviews, classroom observation sheets, Quizizz activity records, and document analysis. The use of multiple instruments aimed to enhance data credibility through methodological triangulation (Miles & Huberman, 1994; Creswell, 2018).

The semi-structured interview protocol was developed based on the objectives of the study and relevant literature on gamified learning, student engagement, Maritime English instruction, and Teaching Factory-based learning. The interview questions focused on students' perceptions, learning experiences, motivation, participation, challenges, and perceived benefits of using Quizizz in Maritime English classes. Open-ended questions were employed to allow participants to provide detailed explanations and reflections on their learning experiences.

The classroom observation sheet was designed to capture students' behavioral engagement during the learning process. The observation indicators were adapted from previous studies on student engagement and gamification and included participation, interaction, collaboration, responsiveness, attention, and task completion. The observation instrument enabled the researcher to document classroom dynamics and students' responses during Quizizz-based learning activities.

To ensure content validity, both the interview protocol and observation sheet underwent expert validation involving three specialists: an ESP expert, an English Language Teaching (ELT) researcher, and an educational technology expert. The experts reviewed the instruments for relevance, clarity, comprehensiveness, and alignment with the research objectives. Based on their feedback, several revisions were made, including simplifying question wording, refining observation indicators, and eliminating ambiguous expressions. Subsequently, a pilot test involving two Maritime English students was conducted to examine the comprehensibility and practicality of the instruments. Minor revisions were made following the pilot test before the instruments were used in the main study.

In addition, Quizizz activity records, including participation frequency, response accuracy, completion rates, and leaderboard performance, were collected to provide

supporting evidence regarding students' engagement and learning behaviors. Document analysis of lesson plans, learning materials, classroom records, and students' learning artifacts was also conducted to corroborate the findings obtained from interviews and observations. The integration of these data sources strengthened the trustworthiness and credibility of the study findings through triangulation.

Table 2. Development and Validation of Research Instruments

Instrument	Purpose	Development Basis	Validation Process	Revision Made
Semi-Structured Interview Protocol	To explore students' perceptions, experiences, motivation, and responses toward Quizizz-based learning	Literature on gamification, student engagement, Maritime English, and Teaching Factory learning	Reviewed by an ESP expert, an ELT researcher, and an educational technology expert	Simplified wording, improved question clarity, and refined sequencing of questions
Classroom Observation Sheet	To observe participation, interaction, engagement, collaboration, and responsiveness during classroom activities	Student engagement and gamified learning indicators from previous studies	Reviewed by the same panel of experts	Refined operational definitions and observation indicators
Quizizz Activity Records	To document participation frequency, response accuracy, completion rates, and leaderboard performance	Automatically generated learning analytics from Quizizz platform	Cross-checked with classroom observations and interview findings	Not applicable
Document Analysis	To support and verify findings from interviews and observations	Lesson plans, learning materials, classroom records, and student artifacts	Triangulated with other data sources	Not applicable

Procedures

The study was conducted over 12 weeks using the Teaching Factory approach integrated with Quizizz-based gamified learning activities. The intervention was implemented once a week, with each session lasting approximately 100 minutes. Each instructional session followed a structured sequence consisting of four stages: (1) introduction to authentic maritime texts and learning objectives, (2) guided reading comprehension activities focusing on literal, inferential, and critical reading skills, (3) Quizizz-based gamified quizzes featuring leaderboards, points, and real-time feedback, and (4) collaborative role-playing and case-study discussions related to maritime communication and operational challenges. The implementation emphasized authentic learning situations that reflected real-world maritime workplace practices. Gamified learning features such as leaderboards, immediate feedback, and competitive quizzes were designed to enhance students' motivation, engagement, and critical reading performance (Degirmenci, 2021; Zhang & Crawford, 2024).

Data Analysis

The data were analyzed using thematic analysis following the procedures proposed by Jenny et al. (2020). First, interview transcripts, classroom observation notes, and document records were transcribed and reviewed repeatedly to achieve data familiarization. During the open coding stage, meaningful statements and recurring ideas related to students' engagement, motivation, critical reading development, and experiences with Quizizz-based learning were identified and assigned initial codes. In the axial coding stage, similar codes were grouped into broader categories by examining relationships and patterns across the data sources. Subsequently, these categories were synthesized into overarching themes that represented students' perceptions and learning experiences during the intervention.

To enhance the trustworthiness of the analysis, two researchers independently coded a subset of the data and compared their coding results. Any discrepancies were discussed until consensus was reached, thereby improving coding consistency and interpretive accuracy. In addition, methodological triangulation was employed by comparing findings derived from interviews, classroom observations, Quizizz activity records, and document analysis. Member checking was also conducted by sharing preliminary interpretations with several participants to confirm the accuracy of the findings. These procedures strengthened the credibility, dependability, and trustworthiness of the study findings (Miles & Huberman, 1994). The final analysis further examined how Quizizz features, such as leaderboards, instant feedback, and interactive competition, influenced students' critical reading performance, engagement, and classroom participation.

RESULT

Impact of Gamified Learning on Student Engagement and Motivation

Student Engagement Levels

Classroom observations and Quizizz activity logs were analyzed to measure engagement. Students were more engaged in gamified quizzes, role-playing exercises, and leaderboard competitions than with traditional reading methods.

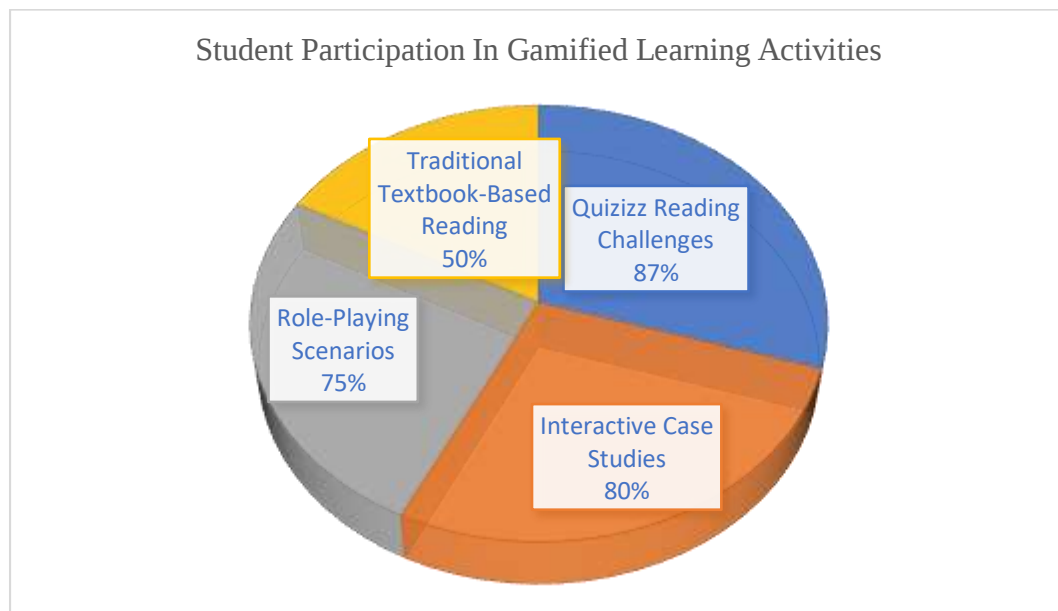


Figure 1: Student Participation in Gamified Learning Activities

Table 1 shows that students had much higher engagement levels with learning activities that included gamified elements, especially Quizizz-based reading challenges (87%) and interactive case studies (80%). In contrast, traditional textbook reading had the lowest

participation rate at 50%, showing that students were less interested in static and passive learning methods.

High engagement can be largely attributed to the interactive and dynamic aspects of gamified learning. Traditional reading exercises usually have students passively obtain information without getting immediate feedback or motivation. Through Quizizz, students were engaged in answering questions, got instant feedback, and competed with their peers in a fun, game-like setting. The competition and real-time progress tracking probably motivated students to stay engaged and participate more actively.

Interactive case studies, with an 80% participation rate, were to show that it can improve students' engagement. These activities helped students use their reading comprehension skills in real-world maritime situations, making learning more relevant and meaningful. Students could analyze maritime incidents, and assessed safety protocols in an interactive, problem-solving setting. These tasks demanded critical thinking and decision-making, leading to greater student engagement than just reading about maritime procedures in a textbook. Furthermore, the data showed that role-playing scenarios had a 75% participation rate, implying that students appreciated practical, hands-on learning. During these activities, students assumed roles like being logisticians, agents, or safety officers, requiring them to read and interpret maritime texts in real-time scenarios. This type of hands-on learning promoted active involvement, allowing students to apply their reading comprehension skills in simulated work settings.

Students showed a clear trend of being more actively engaged in gamified activities, especially Quizizz-based reading quizzes and case studies, than in traditional reading exercises. This supports earlier research showing that gamification boosts student engagement (Hwang et al., 2023).

Student Motivation and Enjoyment

The interviews and questionnaire responses provided valuable insights into how gamified learning affects student motivation in ESP maritime English reading tasks. Students found that gamifying reading activities made them more enjoyable and engaging compared to traditional methods. Instant feedback, interactive challenges, and competition really helped keep students engaged and motivated.

Quizizz gamified learning activities were important to enhance motivation due to their interactive activities. In traditional reading exercises, students often read long passages without engaging actively or receiving immediate feedback. Quizizz provided instant feedback to spot and fix students' mistakes. This feature kept students engaged with the material, enabling them to learn from their mistakes immediately rather than waiting for feedback from instructors.

Quizizz also provided students with a competitive nature to keep them motivated. Many students were inspired to challenge themselves and improve their grades. Leaderboards, points, and rankings made reading comprehension an exciting challenge instead of just another school task. Students had a specific goal to aim for, which increased their motivation to engage more deeply than just completing reading assignments. The following is the result of the interview with students:

Student A: "Quizizz made reading enjoyable. I needed to respond to questions fast rather than read lengthy texts, which kept me focused."

Students discussed how gamified learning affected their engagement and motivation on how Quizizz influenced their reading experience in various ways. This shows how the time limit of Quizizz quizzes encouraged students to read efficiently and process information quickly. Each question was set for the allowed time to keep students focused and engaged with the material, reducing distractions and enhancing comprehension. The other students said:

Student B: *"I get reading difficult, yet quizzes and challenges made me to try harder and harder."*

Gamification as a motivating factor for students who often struggle with reading comprehension. Interactive challenges provided a clear objective and immediate feedback, encouraging students to aim for better results (Pradnyadewi & Kristiani, 2021).

Student C (Minimal Participation): *"I read at a slower pace and lower score however instant feedback in Quizizz means a lot to me because I can learn from my mistakes immediately."*

Students who were not fully engaged in the gamification still recognized the benefit of receiving immediate feedback. Quizizz allows students to fix mistakes immediately, unlike traditional reading assignments, where errors are often noticed later. This method strengthened their understanding and prevented recurring misunderstandings. To further understand the impact of gamified learning on motivation, students were asked to rate their motivation levels before and after the introduction of Quizizz-based reading activities. The results were as follows:

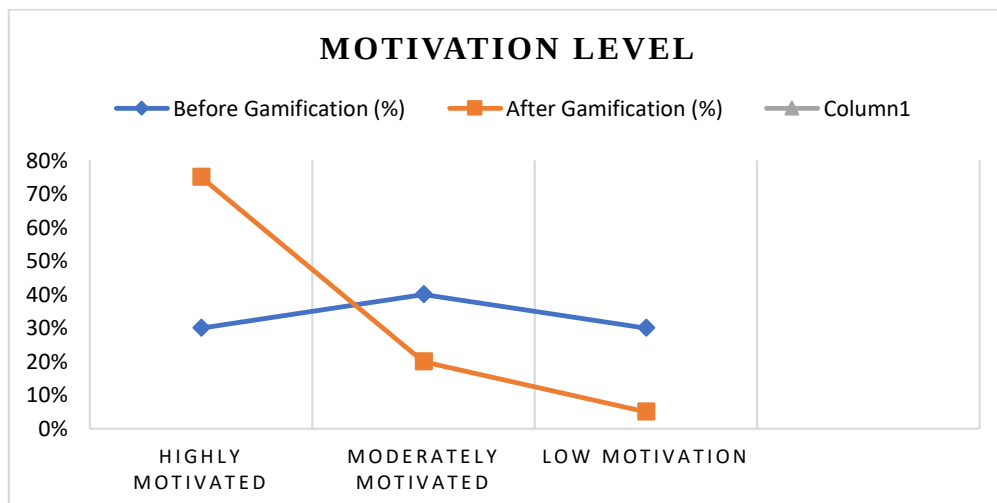


Figure 2. Motivation Levels Before and After Gamification

Figure 2 shows an increase in motivation, highlighting the significant improvement in student attitudes to reading tasks after introducing gamified learning. Data show an increase in highly motivated students from 30% to 75% following the gamified learning. Meanwhile, low motivation levels decreased from 30% to only 5%, showing that even students who were previously unmotivated became more interested in reading comprehension tasks with gamification.

Score on Critical Reading Performance

To evaluate student progress, pre-test and post-test assessments were conducted, categorizing students into high, medium, and low performers. The results indicate that all groups demonstrated measurable improvement, with varying degrees of progress.

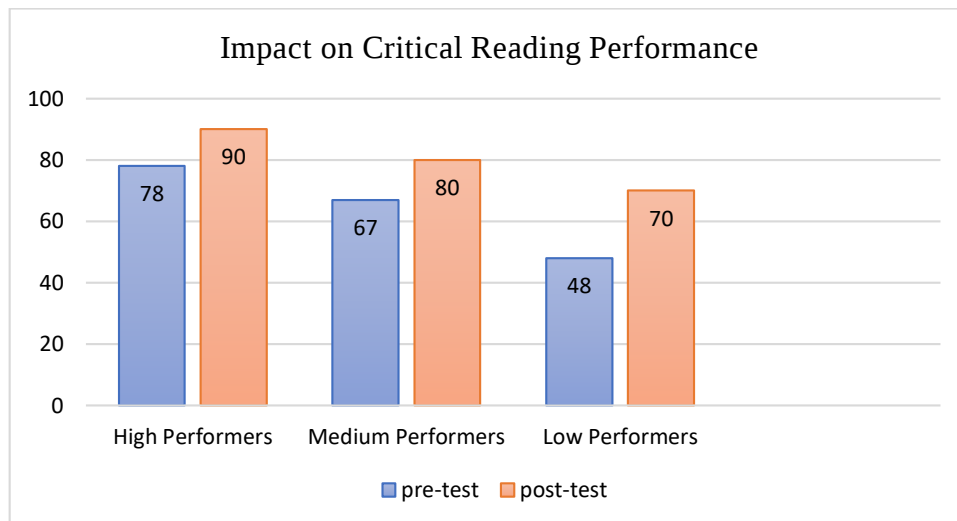


Figure 3. Impact on reading performance

Figure 3 shows that high performers, who started with pre-test scores of 78, demonstrated steady improvement, achieving post-test scores of 90%, showing improvement in their critical reading skills. Medium performers showed consistent growth, with scores rising from 67 in the pre-test to 80% in the post-test. This shows that organized learning and focused practice greatly improved their understanding skills. Low performers showed the most significant improvement, with scores increasing from 48 to 70. This progress shows how well the teaching method supports struggling students, helping them gain confidence and improve their reading comprehension skills. These findings are in line with previous studies on gamified learning platforms like Quizizz, which have demonstrated increased student engagement and motivation. Priyanti et al. (2019) found that students who used Quizizz showed notable gains in reading comprehension over those who relied on traditional methods. Qureshi and Khatoon (2023) found that gamification tools such as Quizizz enhanced students' reading comprehension skills by boosting engagement and offering immediate feedback. A study by Pradnyadewi & Kristiani, (2021) found that using Quizizz as a digital game-based tool led to positive feedback from students and greatly improved their reading comprehension. These studies indicate that using interactive and gamified tools such as Quizizz can significantly boost educational practices and enhance student performance in reading comprehension.

Student Perception on Learning Improvements

Students were asked if they felt their reading comprehension skills improved after participating in Quizizz-based activities and the Teaching Factory approach.

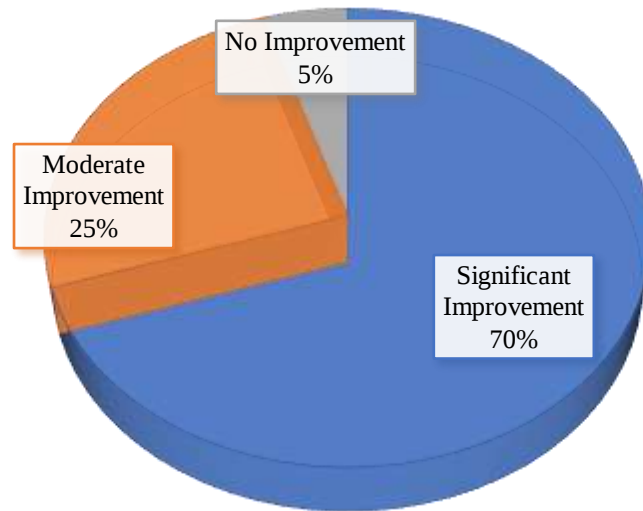
**STUDENT PERCEPTIONS OF QUIZZIZZ-BASED ACTIVITIES
AND THE TEACHING FACTORY APPROACH.**

Figure 4: Student Perceptions of Quizizz-based activities and the Teaching Factory approach

Figure 4 shows that 70% of students reported a significant increase in their critical reading skills, while 25% reported a moderate improvement. Only 5% believed that gamified learning didn't improve their understanding, showing that most students found Quizizz and the Teaching Factory method helpful.

The high rate of perceived improvement may be due to the interactive and engaging aspects of gamified learning. Quizizz revolutionized traditional reading methods by offering instant feedback, a competitive edge, and engaging challenges, which enhance the learning experience and make it more enjoyable. The Teaching Factory approach also enabled students to use their reading skills in real-world maritime situations, enhancing their ability to interpret and analyze technical texts effectively.

Students who noted significant improvement frequently mentioned higher engagement, increased motivation, and better comprehension retention as important factors. Students observed that gamification made them more attentive to reading materials, as they had to quickly understand information to do well in quizzes and reading tasks.

Students who saw moderate improvement likely had some reading skills already but still gained from interactive learning methods. For these students, gamified learning-based ESP maritime English context probably strengthened their current skills instead of teaching them completely new reading strategies. The 5% who saw no improvement might include students with strong reading skills before the study or those who had difficulty adjusting to gamified learning methods in an ESP maritime English context.

Integrating the Teaching Factory model into maritime English instruction has created new opportunities for contextual learning. Students practiced and applied their skills in simulated real-world scenarios by combining traditional reading exercises with gamified tasks. Students worked with technical documents like navigation charts and safety protocols, focusing on quickly interpreting and responding to them. This method improved their reading comprehension and developed the practical skills necessary for effective maritime operations (Sardar, 2024).

Gamified learning, especially with Quizizz-based maritime reading exercises, has proven to enhance performance in practical maritime tasks. Students recognized key coordinates, symbols, and navigational indicators more quickly when under time pressure, a vital skill

for real-world maritime navigation. The quick decisions needed in the gamified format boosted both speed and accuracy. Additionally, interactive safety protocol exercises helped students feel more confident in understanding emergency procedures, allowing them to better analyze fire safety instructions, evacuation protocols, and distress signals (Weines, 2021)

Contextualized Learning through the Teaching Factory Approach

Integrating the Teaching Factory model into maritime English has created opportunities for contextual learning. Students could develop their abilities by engaging in realistic scenarios, combining classic reading activities with game-like challenges. They worked with technical documents like safety protocols, focusing on swift interpretation and action. This developed students' critical reading skills to implement problem-solving so that they can proceed with the practical skills essential for successful maritime (M. Rahman, 2019)

Quizizz for maritime reading exercises showed improved performance in reading through gamified learning in real-world maritime tasks. They were able to coordinate symbols and navigational indicators more swiftly when faced with time constraints, an essential ability for practical maritime navigation.

Therefore, gamification led to quick decisions, enhancing both speed and accuracy. Interactive safety protocol exercises enhanced confidence in emergency procedures, aiding students in evaluating fire safety instructions, evacuation protocols, and distress signals (Bail, 2024; Mauroner, 2019)

The improvements clearly impact maritime education and training specific to the industry. These gamified methods provide better measurement of a student's preparedness for the maritime environment. Instead of just using traditional written tests, teachers should create scenario-based assessments that reflect real-world challenges. This method helps students develop better analytical and problem-solving skills while preparing them for the challenges of maritime operations (Brown, 2000).

The study showed that gamified learning and reading activities improve marine English training. This approach helps students build the technical reading and decision-making skills essential for safe and efficient marine operations while catering to various learning styles. Thus, new educational methods are needed to prepare the next generation of marine professionals as the industry changes.

DISCUSSION

The findings indicate that gamified learning contributed to increased student engagement and motivation in ESP Maritime English contexts (A. H. Wibowo, Oktavia, et al., 2025). Classroom observations and Quizizz activity records revealed that students participated more actively in gamified quizzes, role-playing activities, and interactive case-study discussions than in conventional reading tasks (A. H. Wibowo, Ulfaika, et al., 2025). Descriptive participation patterns showed that Quizizz-based reading challenges generated higher levels of involvement than traditional textbook reading activities. However, these findings should not be interpreted merely as evidence of increased participation. Rather, they suggest that gamified learning may reshape students' interaction with learning materials by creating a more dynamic and learner-centered environment. Features such as immediate feedback, progress tracking, and elements of competition appear to encourage sustained attention and active engagement with maritime texts.

Nevertheless, the increased engagement observed in this study may also be influenced by the novelty effect of digital gamification and the contextual relevance of the learning tasks. Therefore, while gamified learning demonstrates considerable potential for enhancing participation and motivation, its long-term effectiveness in fostering deeper critical reading skills requires further investigation beyond short-term engagement

indicators. This finding highlights the importance of viewing engagement not simply as behavioral participation but as a multidimensional construct that encompasses cognitive investment, persistence, and meaningful interaction with disciplinary content.

The study showed not only increased engagement but also a notable rise in student motivation. Surveys and interviews showed students found gamified exercises more exciting and engaging than traditional methods. Online leaderboards and timed challenges from Quizizz enabled students to remedy errors quickly and encouraged competition and accomplishment. After the intervention, highly motivated students increased from 30% to 75%, as this atmosphere transformed reading assignments into interesting challenges with well-defined objectives.

The findings of this study extend the understanding of both ESP pedagogy and gamification theory within vocational and maritime education contexts. From an ESP perspective, the results suggest that critical reading development is enhanced when language learning is situated within authentic professional practices. The integration of the Teaching Factory approach enabled students to engage with maritime texts, operational procedures, and workplace-related scenarios that closely reflected real-world communication demands. This finding supports the principle that ESP learning becomes more meaningful when language instruction is contextualized within learners' future professional environments, thereby strengthening the connection between language competence and occupational readiness.

From the perspective of gamification theory, the findings demonstrate that game elements such as immediate feedback, progress tracking, and interactive challenges contribute not only to behavioral engagement but also to deeper cognitive involvement in reading activities. Rather than functioning merely as motivational tools, these gamified features appeared to facilitate sustained interaction with complex maritime texts and encouraged students to construct meaning from discipline-specific content actively. This finding extends existing gamification research by suggesting that the effectiveness of gamification in ESP settings lies not solely in increasing participation but also in supporting higher-order reading processes, including interpretation, evaluation, and critical analysis.

Furthermore, the substantial improvement observed among lower-performing students indicates that gamified learning may serve as a pedagogical scaffold that reduces barriers to participation and promotes more equitable learning opportunities. Therefore, the study contributes to the growing body of literature advocating the integration of authentic workplace learning and gamified instructional design as complementary approaches for developing professional language competence in ESP education, particularly in maritime training contexts where critical reading and rapid comprehension of technical information are essential for operational safety and professional performance.

Students' perceptions of their learning progress support the success of these creative teaching approaches. Most students showed improvement in their critical reading skills after taking part in the gamified activities. This change in perception shows a growing confidence in managing complex maritime texts and suggests that gamified learning could be a useful addition to traditional teaching methods.

Therefore, this study emphasized that integrating gamification into maritime English teaching can foster more engaging learning settings, boost motivation, and enhance critical reading skills. The findings highlight important considerations for curriculum development, supporting a mixed strategy that integrates the advantages of both gamified and traditional learning methods to equip students more effectively for the challenging realities of maritime operations. The maritime industry is evolving, and it is crucial to adopt innovative educational strategies to prepare future professionals with the necessary technical and analytical skills for safe and efficient operations.

CONCLUSION

This study demonstrates that integrating gamified learning into Maritime English instruction through the Teaching Factory approach positively supports students' engagement, motivation, and critical reading performance. The use of interactive platforms such as Quizizz creates a more authentic and practice-oriented learning environment that reflects real maritime communication challenges, enabling students to interpret technical documents more effectively and respond to professional situations with greater confidence. The scientific contribution of this study lies in demonstrating how the integration of gamification, ESP principles, and workplace-oriented learning can simultaneously strengthen language competence and occupational readiness in maritime education.

From a practical perspective, Maritime English lecturers can implement this approach by incorporating authentic industry materials, such as safety manuals, standard operating procedures (SOPs), navigation reports, cargo-handling instructions, and maritime incident reports, into reading activities. These materials can be transformed into Quizizz-based tasks that require students to identify key information, make inferences, evaluate operational decisions, and solve scenario-based maritime problems. Lecturers may organize instruction following a Teaching Factory sequence consisting of workplace-oriented text exploration, guided critical reading activities, Quizizz-based formative assessment with immediate feedback, and collaborative case-study discussions or role-playing simulations. In addition, features such as leaderboards, timed challenges, and progress tracking can be strategically used to maintain student motivation and monitor learning development. By integrating authentic maritime documents with gamified reading tasks, lecturers can create learning experiences that closely mirror workplace communication demands while fostering students' critical reading abilities and professional preparedness.

However, this study was limited by its relatively short implementation period and small participant scope, which may not fully capture the long-term effectiveness of gamified learning. Future studies are recommended to conduct longitudinal investigations and compare different gamification platforms to examine the sustainability and broader impact of gamified Maritime English instruction over time.

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Conflict of Interest

All authors declare that they have no conflicts of interest.

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Author Contribution

Conceptualization: Jannatul Laily Noviabahari, Yusuf Olayinka Shogbesan and Amiruddin Hadi Wibowo; methodology: Amiruddin Hadi Wibowo and Eliasanti Agustina; investigation: Yusuf Olayinka Shogbesan, and Elga Tasya Ardiansah; writing—original draft preparation: Jannatul Laily Noviabahari and Amiruddin Hadi Wibowo; writing—review and editing: Yusuf Olayinka Shogbesan and Amiruddin Hadi Wibowo ; visualization: Elga Tasya Ardiansah and Eliasanti Agustina. All authors have read and agreed to the published version of the manuscript.

Data Availability

The datasets generated and analyzed during this study are not publicly available due to the inclusion of participants' personal information. However, they are available from the corresponding author upon reasonable request and with appropriate ethical approval.

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