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Preliminary evidence on gamified learning to improve competency in Standard Marine Communication Phrases (SMCP) in Malaysian maritime education

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ABSTRACT

This study presents the results of a feasibility study on the use of gamified learning to improve competency in Standard Marine Communication Phrases (SMCP) in a two-day practical course at two Vessel Traffic Service centers in Malaysia. The Standard Marine Communication Phrases (SMCP) have been used mandatorily in ship-to-ship and ship-to-shore radio communication since November 2001, and, as the working language of merchant ships, have contributed significantly to reducing miscommunication at sea. 10 vessel traffic service operators from 2 vessel traffic centers in Melaka and Johor Darul Takzim participated in this feasibility study, which used gamified learning interventions to enhance their competency in SMCP. Via gamified learning, respondents were trained to effectively memorize and use 100 SMCP in their professional duties, which involve communicating with merchant vessels operating within their areas of operation. The results of this study, which used pre- and post-test techniques, revealed that all respondents recorded significant improvement in post-test scores, supporting the effectiveness of the gamified learning method used in the experiment. Furthermore, the paired-sample t-test also confirmed a significant difference between the pre- and post-test scores. The finding enriches knowledge of SMCP teaching and learning and offers a new way to deliver effective training. It benefits maritime educators seeking additional trainee engagement methods within teaching-learning-assessment approaches for STCW (International Convention on Standards of Training, Certification and Watchkeeping for seafarers) courses.

Keywords: Gamified learning, SMCP (Standard Marine Communication Phrases), STCW (Standards of Training and Certification for Watchkeeping), vessel traffic service

INTRODUCTION

The Standard Marine Communication Phrases (SMCP) have been the working language of the shipping industry since 2001 (Trenkner, 2000; Trenkner & Cole, 2010). It has been instrumental in ensuring the safety of navigation and merchant ships' operations, reducing miscommunication and uncertainty worldwide. Unfortunately, there have been many marine catastrophes involving merchant ships, with 55% of these disasters attributable to communication deficiencies (Kluijven et al., 2009; Trenkner & Cole, 2010). Insufficient command of English in ship-to-ship and ship-to-shore communication has been identified as the primary factor (Trenkner, 2008). Hence, SMCP has been developed by the International Maritime Organization (IMO) to mitigate this issue, as it is used primarily in ship-to-ship and ship-to-shore radio communication.

Since its inception, SMCP has been intensively studied, as many stakeholders in the merchant shipping industry have prioritized its importance in radio communication, including communication with coast stations, Vessel Traffic Service (VTS) centers, and harbor pilots. Training in these types of radio communication is highly specific and niche, involving customized approaches and tailor-made materials. Therefore, to achieve the objective of this research, a specific approach known as gamified learning was developed to improve SMCP learning among vessel traffic service (VTS) operators through a two-day intensive practical course conducted in 2024. This paper is entirely innovative, as it highlights and examines VTS operators' professional challenges in internalizing 100 safety-related phrases of the Standard Marine Communication Phrases (SMCP) within 2 days, with the assistance of the developed gamified learning. In the past, the conventional approach to training in marine communication for both Maritime English and the SMCP relied more on drill and practice, preceded by lectures and role-plays. This research initiated an innovative investigation into gamification and other readily technology-driven methods for conducting STCW courses for the long-term benefit of trainees in maritime education.

LITERATURE REVIEW

Gamified Learning

Kapp (2012) was among the first to define gamification as the use of game elements in real-world settings to motivate participants. The specific method of using gamification in learning is popularly known as 'gamified learning', and it has the potential to improve learners' engagement (Jia et al., 2020; Rahman et al., 2018; Putz et al., 2020; Ritzhaupt et al., 2021; Shen et al., 2024; Ukgoda, 2025). The trend of integrating gamified learning to motivate learners has sparked many related studies in training and higher education. More recent empirical studies across educational sectors have shown that gamified learning leads to better performance and achievement (Lampropoulos & Sidiropoulos, 2024; Li & Jianxing, 2025; Ortiz-Rojas et al., 2025; Rayan & Wattad, 2024). These contributed to selecting gamified learning as the sole teaching approach in this study.

In gamified learning, conventional lessons delivered via lecture slides are converted into interactive, competitive quiz questions within the gamification application of choice (Chiriboga et al., 2025). Using their own smartphones, respondents will compete with each other to answer quizzes, earning points for each correct answer as quickly as possible (Huseinovic, 2024). The gamification application will record

respondents' immediate responses to the questions, indicate the level of correctness, and display the results for each question and the quiz as a whole (summative). At the same time, this reflects learners' state of learning as they become familiar with the lesson (Al-Khresheh, 2025). The scores obtained and podium position (leaderboard) help to indicate learners' performance or achievement in the lesson.

In Maritime English, where the SMCP has been an integral part, gamification, or gamified learning, has been proposed as an effective learning method (Diahyleva et al., 2024; Yurzhenko et al., 2024). Both studies cited the engaging nature of gamified learning and its motivating elements as the main factors for opting for gamification in maritime education, particularly in Maritime English and SMCP. However, the initiative requires thorough planning, as gamified learning requires thoughtful consideration of lesson complexity, lesson duration, learners' familiarity with the gamification quiz, and teacher feedback on the lesson. The studies also find that gamified learning helps enhance marine engineering cadets' communication skills and teamwork (Diahyleva et al., 2024). In another related study, gamified learning has been cited to enhance marine cadets' linguistic and operational readiness (Shvetsova, 2025). It provides the necessary cues and assistance to reinforce language items and linguistic competence taught earlier, thereby leading to their readiness for marine operations. Recent findings also highlight gamified learning as a successful factor in enhancing vocabulary acquisition, especially marine terminology (Tymofyyeva, 2025).

To date, although numerous studies cite gamified learning as a success factor in learning, none has been conducted in the specific context of learning SMCP in Malaysia. Hence, the efforts undertaken by the authors can be regarded as a step toward new ground in bridging knowledge gaps in SMCP research and learning.

The Motivational Frameworks of Gamified Learning

The effectiveness of gamified learning is deeply rooted in its motivational frameworks. These frameworks not only make learning interesting but also strategically target learners' cognitive and emotional drivers through the ARCS Model of Motivation and Self-Determination Theory (SDT). Generally, when it comes to gamification, gamified learning, and game-based teaching, these two frameworks are often referred to together.

Keller's ARCS Model of Motivation is a systematic framework used for developing instruction that motivates learners (Si & Law, 2026). Although it was originally used to design learning activities in classroom settings, many researchers have found that ARCS motivates learners and helps achieve learning goals across all educational settings (Zain et al., 2026). It suggests that for learning to be effective, instructions must capture and sustain learners' attention, demonstrate Relevance to their individual goals and needs, build Confidence that they can succeed, and provide Satisfaction through internal and external rewards. These elements of ARCS must be prevalent in learning activities in order to be successful. Gamified learning is perfectly aligned with the ARCS Model of Motivation (Keller, 2016; Si et al., 2025). Leaderboards can capture the element of Attention; realistic marine-themed scenarios can portray Relevance to future/existing careers at sea; Confidence can be built up by immediate feedback on a quiz; and earning points and ranks can provide immediate Satisfaction.

Similarly, Self-Determination Theory (SDT) complements the motivational elements of gamified learning when the three basic psychological needs are fulfilled (Grubješić et al., 2026). These basic human psychological needs are known as Autonomy, Relatedness, and Competence. Autonomy refers to the feeling of having choice and control over one's actions. Gamified learning allows learners to choose their difficulty level and quiz options, which fosters a sense of autonomy that is not prevalent in

conventional lectures (Chapman et al., 2025). On the other hand, Relatedness refers to the feeling of being connected to others. Multiplayer features, leaderboards, scores, ranks, and team-based challenges in gamified learning foster a sense of relatedness and community among all participants (Moller et al., 2026). Competence creates the need to feel effective in one's interactions with one's surroundings. Earning points, ranks, and difficulty levels are elements of gamified learning that enhance self-efficacy (Grubješić et al., 2026). By fulfilling these psychological needs, gamified learning creates a competitive learning environment that fosters deep, autonomous learning, transforming simple knowledge transfer into genuine intellectual competition.

IMO SMCP

The Standard Marine Communication Phrases (SMCP) is the lingua franca of merchant ships, used by both the navigation (deck) and engineering departments (International Maritime Organization, 2011; Giovanoglou, 2025; Pritchard, 2002; Trenkner, 2000). The objective of SMCP is to reduce misunderstandings in safety-related verbal communication in merchant ships' operations, especially in ship-to-shore and ship-to-ship radio communication (Dimitrakiev et al., 2025). Specifically, it has been developed to fulfil three objectives namely, 'to assist in the greater safety of navigation and the conduct of the ships, to standardize the language used in communication for navigation at sea (port approaches, waterways, harbors and on-board vessels with multilingual crew members) and to assist maritime training institutions in meeting the two objectives mentioned earlier' (International Maritime Organization, 2002, p.1).

The SMCP is divided into Part A, External Communication Phrases, and Part B, On-board Communication Phrases, and is required by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) (International Maritime Organization, 2002). The instruction of SMCP should be based on practice in the maritime environment and should be implemented through appropriate modern language teaching methods.' (International Maritime Organization, 2002, p.2). Jurkovic (2025), Pritchard (2002), Ryzhkov (2024), and Trenkner (2000) elaborate that SMCP is highly structured for use in distress, urgency, safety, and routine communication at sea via maritime Very High Frequency (VHF) Radio. The SMCP emphasizes procedures, signals, and rules for initiating, terminating, and conducting formal communication exchanges on maritime VHF Radio (Pritchard, 2002). The commonly highlighted contexts include ship's maneuvering, navigational watch, helm orders, position reporting, berthing, anchoring, pilotage, and other navigational situations at sea.

Pedagogical Challenges in Conventional SMCP Classrooms

Despite its critical importance in merchant shipping, conventional SMCP instructions face several pedagogical challenges. The nature of the SMCP itself can lead to monotony and disengagement, as it is highly prescriptive and overly narrow. Studies conducted in maritime institutions often revealed that conventional lectures, role-plays, drills and practice are 'boring and unattractive' (Noble & Peters, 2019). These activities are not sufficient in stimulating active participation from trainees. Moreover, the lack of use of technology and interactive elements has led modern trainees, especially Generation Z learners, to experience low motivation to learn and retain SMCP (Ahmmed, 2018).

Moreover, while valuable, the use of Learning Management Systems and ship simulators may not fully address the underlying issue of student engagement. The same goes for Kahoot and Quizizz, which have been used as course refreshers and to measure understanding. These innovative learning technologies must be used to foster deep learning and SMCP retention. The lack of a pedagogical strategy may

prevent the achievement of learning objectives. Trainers must carefully plan their lessons by aligning materials and strategies with SMCP acquisition, retention, and recall to be successful (Kutsenko, 2025). The pedagogical challenges of SMCP require trainers to explore more dynamic and engaging teaching approaches that prioritize cognitive engagement, memory, and motivation. Gamified learning has been considered to have the potential to enhance engagement, memory, and motivation, enabling trainees to memorize, retain, and recall SMCP more effectively (Chernov, 2021).

METHODOLOGY

Research Design and Instrument

This study used a quasi-experimental pre- and post-test design (Creswell & Creswell, 2022) and collected quantitative data from participants in a two-day professional course in Vessel Traffic Service Management. The primary research instruments were a pre-test and a post-test, which were conducted at different points of the course duration (at the beginning and end of the course). They were developed from standard IMO SMCP Achievement Tests, approved by the Marine Department of Malaysia (MARDEP), the sole regulator and agency certifying competent merchant ship navigators and engineers. The 50 multiple-choice tests (100 marks in total) covered safety-related phrases on VHF Radio that must be used in routine (daily) communication between ships and VTS centers, as well as in distress situations. Both tests were conducted online via the Microsoft Forms platform, with respondents clicking the link provided in the WhatsApp message.

The research methodology for this study was straightforward but carefully planned, as it was conducted in the midst of a professional course regulated by the authority. Too much focus on the methodology would disrupt the classroom dynamic, while too much focus on the course may also affect the data and findings.

Objectives of Study

This study aims to help VTS operators memorize 100 SMCP phrases and retain those phrases for professional use. Hence, the gamified quizzes on Kahoot have been aligned to address these two objectives. The decision to include pre- and post-tests in the module is expected to reinforce participants' memory and retention while evaluating their performance. These research objectives are formulated as research hypotheses to guide the study.

Research Hypotheses

As this research aims to assist VTS operators in better memorizing and mastering SMCP for their daily professional duties, only a null and an alternative hypothesis have been developed for further testing in this study. The authors believe that both are sufficient to indicate whether the investigation has fulfilled its stated objective. Hence, the research hypotheses have been developed as follows:

H₀: There is no significant difference in the scores of the pre-test and post-test of respondents, and therefore, the gamified learning is not effective.

H₁: There is a significant difference in the scores of the pre-test and post-test of respondents, and therefore, the gamified learning is effective.

Based on the null and alternative hypotheses above, the investigation was designed to determine the effectiveness of the developed gamified learning in assisting respondents in this study to learn SMCP from a single point of view.

Gamified Learning in the study

The gamified learning developed for this study consists of only three modules on VTS-related SMCP phrases and vocabulary for VHF (Very High Frequency) radio. They were developed by Kahoot! a popular gamification application in higher education (Tymoshchuck, 2025). The related subtopics were Message Markers, Navigation Situations, and VTS Communication Safety-related Phrases. There were 60 questions allocated to the Message Markers and Navigation Situations subtopics, while VTS Communication Safety-related phrases, as the course title indicated, consisted of 40 questions. All respondents had to go through 2 rounds of gamified learning: a live session (class competition) and an offline mode (after formal class) to familiarize themselves with all 100 SMCP and master them accordingly.

Gamified learning was chosen for this study primarily due to its convenience and motivational elements (Buckley & Doyle, 2016; Deterding et al., 2011; Lashari et al., 2024; Licorish & Lotter, 2022; Tao & Zou, 2023; Wang & Tahir, 2020). The conventional method is not suitable for a short-duration course like this, as such a professional upgrading course must be practical, hands-on, enriching, and motivating. This is because successful learning results from motivated learners (Bandura, 2001; Keller, 2016; Malone, 2023; Ryan & Deci, 2024; Skinner, 2023; Tymoshchuck, 2025).

During development, all gamified quizzes were manually created in Kahoot! with all questions identical to those on the SMCP Achievement Test, as illustrated in Figures 1 and 2. The authors converted the questions by manually typing them into the specific module, as indicated earlier. Currently, Kahoot! has a new, improved feature whereby questions for gamified quizzes are no longer manually constructed. Instead, they can be automatically generated by artificial intelligence. This increases the quality and analytical nature of gamified learning.

Figure 1

VTS Communication Quiz Question on Kahoot

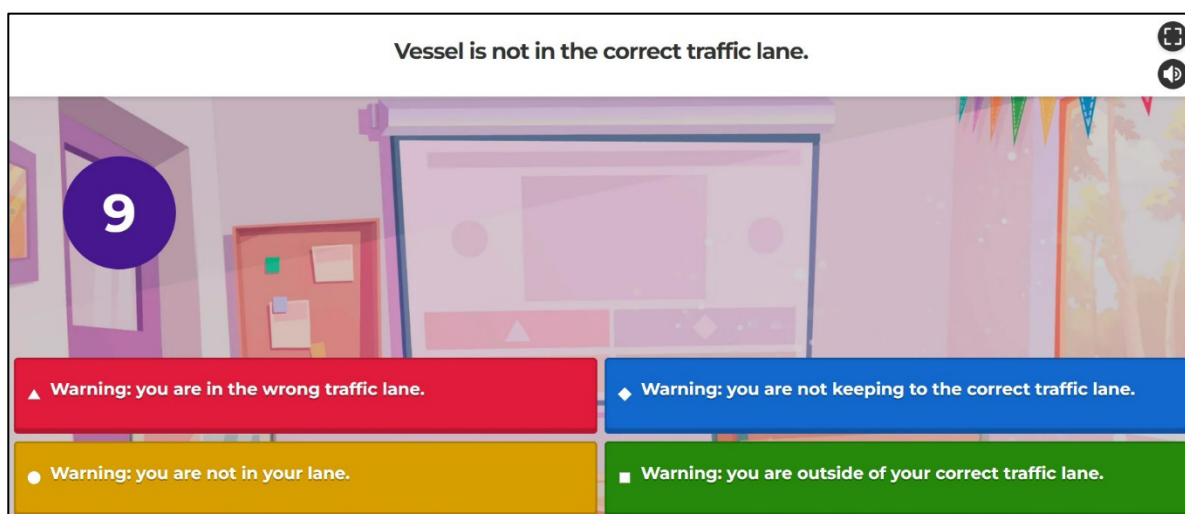
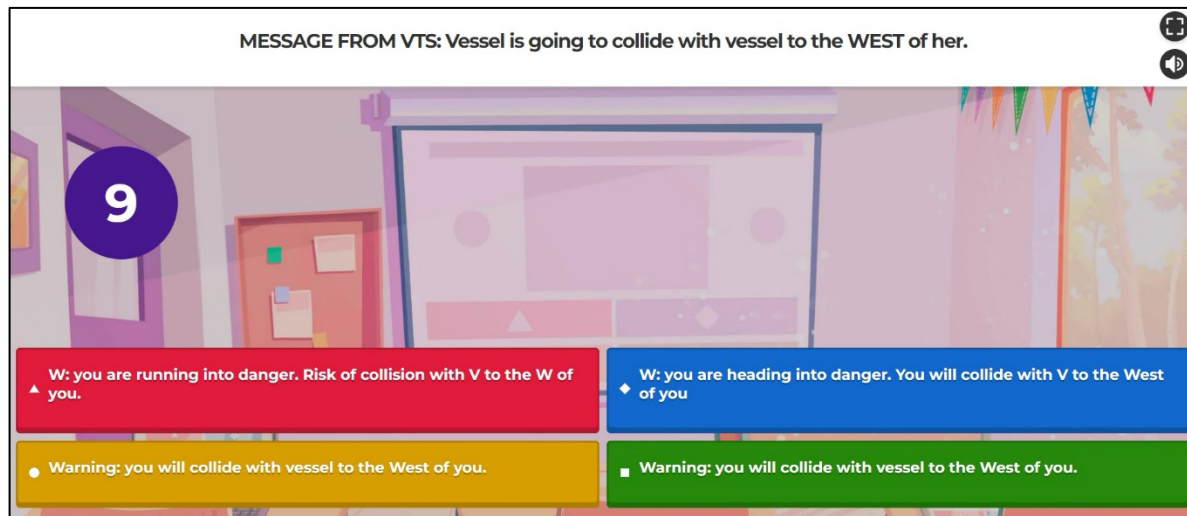


Figure 2

Navigation Situations Quiz Question on Kahoot!



Respondents

There were ten (10) participants in this study, and all of them were Malaysian male citizens who have been serving at the Kuala Linggi and Pengerang stations for 3-6 years as VTS operators. Their ages ranged from 26 to 40 years. The majority were degree holders from local universities majoring in various maritime-related fields (Maritime Logistics, Maritime Management, Maritime Transportation, etc.). However, no one was formally trained in SMCP or had received structured instructions in the subject matter despite the importance of SMCP in marine communication. Respondents admitted that they had undergone professional training for VTS operators, provided by the stations' administration in the form of On-the-Job Training (OJT) and professional upgrade courses under the Ministry of Human Resource scheme from time to time. The sampling method used was convenience sampling, as the company selected personnel to attend the training, and all course participants were chosen as respondents in the study. Respondents also agreed to take part in the experiment despite their busy work shifts.

Data Collection

Data were collected at the beginning of the course, before class officially started, and one week after the course ended. After a brief introduction to the course, the researcher administered a pre-test to respondents to assess their existing level of competency in SMCP. A link to the MS Forms platform was sent to everyone via WhatsApp, and they took the pre-test for approximately 30 minutes. The post-test was conducted a week after the course ended, under the supervision of the training manager. Normally, a post-test is conducted right after the experiment. However, in this case, it was conducted a week later, with skepticism that the effects of gamified learning might fade over time. This was deliberately done to investigate respondents' conceptualization of SMCP, especially their ability to recall all 100 SMCP items with the assistance of the gamified learning used in the experiment. The order of questions and options in the post-test was randomly arranged to prevent the effects of question familiarity. The sequence of topics, questions, and options per question was also randomly rearranged to prevent further familiarization. Unlike the pre-test, the post-test was reduced to 20 minutes (10 minutes less than the pre-test) to increase the level of difficulty.

Data Analysis

Data were processed and analyzed only after all respondents had completed the post-test. SPSS version 28 was used to process and analyze the data for further discussion and conclusion. Accordingly, the pre- and post-test results were made available to participants, and a copy of the report was sent to the management of VTS stations. However, comprehensive data were retained for research publication purposes and would be forwarded to management only in the form of a published research paper.

FINDINGS AND DISCUSSION

Initial finding (Average score for Pre-Test)

The initial findings of this study are presented in a conventional table format to compare pre-test and post-test scores before employing a statistical technique to confirm further differences in scores and their significance. Table 1 below shows the average score of all 10 respondents on the pre-test.

Table 1

Average score of Pre-Test

N	Total score of Pre-Test	Average score of Pre-Test
10	100	42.4

The 50 multiple-choice questions in the pre-test had a total score of 100 marks. From Table 1, the average score obtained by all 10 respondents in this study was 42.4 out of 100. Based on a normal test scale, the low score obtained indicated a 'Failed' condition, falling below half of the total score (50 out of 100). The level of respondents' competency in SMCP at the beginning of the course can be directly inferred from this number. It indicates that the SMCP competency level of all 10 respondents was low at the initial stage of the investigation, before the gamified learning experiment. The score also served as the threshold for measuring progress on the post-test ($>$ or $<$ 42.4). From this score of 42.4, it is clear that all respondents in this study failed the initial assessment of the SMCP Achievement Test, as their scores were all below 50. The scores for each respondent on this pre-test can be found in Table 3 in the following section.

In the post-test, it was found that the average score of all respondents improved from 42.4 in the pre-test to 80 in the post-test, as indicated in Table 2. This sharp increase in scores (37.6 marks) demonstrated the progression of respondents from 'Failed' to 'Distinction' level. It could also be summarized that all respondents obtained an 'A' on the post-test, compared to an 'F' on the pre-test assessment conducted earlier. This progression may be attributed to the experiment, whereby gamified learning assisted respondents in better memorizing and conceptualizing SMCP. The comparison of individual scores in the following section further supports this progress. The post-test scores for each respondent can be found in Table 3 in the following section.

Table 2

Average score of Post-Test

N	Total score of Post-Test	Average score of Post-Test
10	100	80

To further highlight the respondents' improvement, Table 3 compares individual pre-test scores with post-test scores. The fourth column provides information on the increase in scores each respondent demonstrated on the post-test compared to the earlier pre-test. This comparison is crucial, especially when no other statistical method is applied to illustrate the difference in the obtained scores, which helps readers make quick comparisons and draw conclusions.

Table 3

Comparison of individual scores in pre- and post-tests

Respondent	Pre-test score	Post-test score	Score increase by
Candidate 1	38	77	39
Candidate 2	46	75	29
Candidate 3	43	82	39
Candidate 4	47	83	36
Candidate 5	37	82	45
Candidate 6	39	82	43
Candidate 7	43	80	37
Candidate 8	44	81	37
Candidate 9	45	78	33
Candidate 10	42	80	38

The increase in scores ranges from 29 (lowest) to 45 (highest), with the lowest post-test score being 75 (Candidate 2) and the highest 83 (Candidate 4). 7 respondents had obtained a score of 80 or above, while the remaining 3 had recorded a score below 80 but still above 75. Obviously, the majority of respondents scored 80 or above, while a minority scored between 75 and 80. These total scores and increases in scores were considered significant, as they supported the contribution of gamified learning to improving respondents' SMCP competency in this study.

Statistical Analysis (Paired Sample T-Test)

To strengthen the conclusion, a more thorough statistical analysis was conducted to confirm further the significance of the findings in the earlier section. The paired-sample T-Test has been identified as the most suitable for comparing two measurements from the same unit of respondents. Hence, a paired-sample T-Test was administered in this study to determine whether the differences between pre-test and post-test scores are significant, as guided by the null and alternative hypotheses developed earlier. Table 4 presents the initial findings of the T-Test for further analysis.

Table 4

Paired Sample Statistics for Pre-test and Post-test

		Paired Samples Statistics			
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pretest	42.4000	10	3.40588	1.07703
	Post-test	80.0000	10	2.58199	.81650

As this study was conducted as a pilot investigation involving a limited sample of 10 respondents, the findings presented herein should be regarded as preliminary and interpreted with due caution. The results are indicative of initial trends rather than generalizable conclusions, and further validation with a larger and more representative cohort is warranted before broader claims can be substantiated.

With this limitation duly acknowledged, Table 4 presents the pre-test and post-test results of the 10 respondents. The mean pre-test score was recorded at 42.4, falling below the passing threshold of 50 (out of 100). This finding suggests that, on average, respondents had not yet attained the requisite level of competency in SMCP prior to the intervention, reflecting a relatively low baseline proficiency at the commencement of the course. Following the administration of the learning intervention, the mean post-test score rose to 80.0, representing a marked improvement relative to the pre-test outcome. This result indicates that, on average, respondents not only exceeded the passing threshold but also demonstrated a substantial enhancement in SMCP competency subsequent to the intervention. Notably, this improvement was observed within a relatively short training period of one week, after which respondents resumed their duties as VTS Operators. While these preliminary results suggest a positive short-term effect of the intervention on SMCP competency, they should be considered exploratory in nature, given the constraints inherent to the pilot study design.

Building on the preliminary trends observed in Table 4, Table 5 presents the paired-samples statistical analysis conducted to formally test the study's hypothesis regarding the effectiveness of the gamified learning intervention.

Table 5

Paired Sample Test

		Paired Samples Test							
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	pretest - posttest	-37.60000	4.55095	1.43914	-40.85555	-34.34445	-26.127	9	<.001

The mean difference of -37.60 confirms a significant increase in post-test scores relative to pre-test scores, lending statistical support to the improvement in SMCP competency noted earlier. As this mean difference was found to be statistically different from zero, the null hypothesis (H_0 : *there is no significant difference between the pre-test and post-test scores of respondents, indicating that the gamified learning intervention is not effective*) is rejected, in favor of the alternative hypothesis (H_1 : *there is a significant difference between the pre-test and post-test scores of respondents, indicating that the gamified learning intervention is effective*). Accordingly, this study accepts the alternative

hypothesis and rejects the null hypothesis, providing preliminary statistical support for the effectiveness of the gamified learning intervention within the context of this pilot study.

CONCLUSION AND RECOMMENDATIONS

The results in the previous section suggest a statistically significant difference between respondents' pre-test and post-test scores. This preliminary finding suggests that the gamified learning administered in the course may have contributed to improving the SMCP competency of VTS operators, though the small scale of this study means the result should be interpreted with caution. In other words, the use of gamified learning appears to have helped familiarize respondents with the phrases and vocabulary used in SMCP. The engaging elements of gamified learning and gaming in Kahoot! such as competition, scores, leaderboards, and immediate feedback, may have contributed to this outcome, although this study did not isolate the specific effect of each element. However, more efforts should be made to conduct similar studies with more participants in order to obtain more generalizable and conclusive results. It is proposed that a sample size of 30–40 would increase the statistical power and reliability of results in future related studies. It is also recommended that a mixed-mode study combining quantitative and qualitative methods be conducted in the near future to yield more credible and comprehensive findings. Future improvements should also consider the duration of the experiment. A two-day period is considered rather short for measuring the effectiveness of gamified learning, as other higher learning institutions have already tested it over semester- or year-long periods. Therefore, it is proposed that a more practicable duration, i.e., 2 to 10 weeks, be adopted in future studies to improve the reliability of results.

There is an area of concern that was overlooked in this study: the one-week gap before the post-test. During this period, all respondents returned to their respective stations and discharged their duties as VTS operators, which led them to use SMCP in their daily routine to the fullest. This, to some extent, provided considerable assistance in their full memorization of the SMCP taught earlier in the course. This factor was not recorded, as the course was aimed at helping them memorize the phrases so that they would be more competent in their daily communication with ships transiting their area. This might be the missing link that actually galvanized their performance on the post-test, namely the practical use of SMCP in ship-to-shore communication, as targeted earlier. Hence, more careful planning and analysis are needed in the near future to conduct more comprehensive studies on the teaching, learning, and use of SMCP.

The results of this study will affect the conduct of SMCP courses in three distinct ways. Firstly, the gamified learning approach may now become one of the pedagogical approaches in short maritime professional courses (STCW). Due to their lack of engagement and motivation, conventional teaching methods may no longer be suitable for training, and it is now timely to adopt more engaging and motivating approaches in training programs to improve their effectiveness. Maritime institutions should prioritize engaging learners to help them be more successful in their learning. Other maritime training institutions and trainers should take this opportunity to adopt gamified learning, as it is convenient for everyone. There is little technology adaptation required, as it uses only classroom facilities (PC or laptop, internet connection, LCD projector, and white screen) and smartphones, which are owned by everyone. The outcomes shall be rather immediate as learners will show positive reactions and acceptance to this new pedagogical approach.

Secondly, the results of this study may inspire further research on SMCP, particularly in its teaching and learning. It is anticipated that there will be more studies on gamified learning in other competency-

based courses, leading to greater knowledge sharing and better-documented successful learning outcomes. These automatically add to the body of knowledge in gamified learning, thus helping to bridge the gap in implementing innovative teaching methods. There will be more highlights on engaging methods for adult and professional learning, which will also benefit regular courses conducted on campus. Success stories will be replicated, while learning drawbacks will be addressed through consistent research and improvement. This will lead to a satisfactory passing rate for each course conducted.

Finally, this study will also assist in the development of more holistic and effective assessment of learners. All courses conducted from now on shall use pre- and post-tests to measure learners' achievement and the effectiveness of facilitation quickly. This effective integration shall make STCW course training more objective. It is vital now to pinpoint learners' starting point and then highlight the successful end condition to mark the end of their learning journey. Maritime academies, as well as their clients, need to be more conclusive and objective in their course assessments, and this pre- and post-test method may lead to significant, continuous improvement in teaching, learning, and assessment across all professional courses. Overall, a structured pedagogical approach, if implemented carefully, will ensure the success of a training program. Gamified learning may become a preferred method for learning the Standard Marine Communication Phrases (SMCP), but further studies are needed to explore its effectiveness better.

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CONFLICT OF INTEREST

The author declares that he has no conflicts of interest.

DECLARATION OF GENERATIVE AI USE

I acknowledge that Grammarly (<https://www.grammarly.com>) was used solely to improve grammar, readability, and language. All AI-assisted content was reviewed and edited by the authors. No AI tools were used to generate data, conduct analyses, modify research results, or draw conclusions. The authors take full responsibility for the content of the manuscript.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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