KMI International Journal of Maritime Affairs and Fisheries • Volume 14 Issue 2 December 2022 pp. 163-175 •
https://doi.org/10.54007/ijmaf.2022.14.2.163

Using Learning Management System to Motivate Merchant Ship Crew to Learn Maritime English

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ABSTRACT

This paper evaluates the uses of the Learning Management System (LMS) in motivating merchant ship crew members to learn Maritime English. The study was conducted in February 2022 on 26 participants who were undertaking the Ratings' Maritime English course at a premier maritime education and training institution in Malaysia. The findings of the quantitative study which used the Instructional Materials Motivational Survey showed that there was a medium to high level of motivation in all evaluated domains of the Attention, Relevance, Confidence and Satisfaction Model of Motivation. Further Pearson correlation indicated that there were significant correlations between the good organization of the LMS content with learners' confidence and between the layout of the LMS with learners' enjoyment learning the lesson. These findings help to further improve the delivery of the course and the development of LMS especially in features that could enhance learners' motivation to learn Maritime English in asynchronous mode.

Key words : Maritime English, Learning Management System, student motivation, Attention, Relevance, Confidence and Satisfaction (ARCS) model of motivation, merchant ship crew

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Received October 20, 2022; Received in revised form November 24, 2022; Accepted December 21, 2022

1. Introduction

The global pandemic of Covid-19 has resulted in the emergence of alternative and innovative delivery methods of the International Conventions on Standards of Training, Certification and Watchkeeping for seafarers (STCW) courses in the world and in Malaysia especially, for example, the online distance learning (ODL), among others. The regulator of the STCW programs in Malaysia, the Marine Department of Malaysia has already mandated the delivery of courses via the ODL method to all 37 maritime education and training (MET) institutions during the Movement Control Order periods from March 2020 to March 2022. This enforcement has resulted in drastic changes in the whole teaching, learning and assessments (TLAs) of the STCW courses. The training of merchant ship crew members too, has experienced these drastic changes as it must also be effectively conducted, regardless of the turmoil of the pandemic.

Within the ODL method, many higher learning institutions have also embedded the use of Learning Management System (LMS) to further support TLAs initiatives. Like the rest, Akademi Laut Malaysia too, has its own LMS platform, which is based on Moodle applications since 2016. The Covid-19 pandemic has galvanized the usage of LMS as it has been an ideal solution in providing asynchronous and synchronous lessons, interactive learning materials and formative and summative quizzes to learners, especially in closing the gap of ODL. As concluded by Bandura (1994), Biggs (1991), Buckley and Doyle (2016), Cook et al. (2009), Gagné (1985), Kapp (2012), Keller (1979) and Maslow (1943) that motivation leads to meaningful learning, the online delivery of the STCW course too, shall be motivating in nature. Hence, for the first time ever in the history of STCW delivery in Malaysia, this study provides better insights on motivational characteristics of LMS in teaching Maritime English to merchant ship crew (Ratings' Maritime English course), as experienced in February 2022.

To briefly define the LMS, Annamalai et al. (2021) reported that it is specifically used in tertiary education 'to integrate teaching and learning technology' (p. 1). Dobre (2014) helped to narrow down the scope by highlighting further that it is a 'set of software platforms, delivered to users by instructors through internet and by the use of various hardware means' (p. 314). In short, LMS can be defined as a technology-based enabler to have convenient access to learning content and its management (Berking and Gallagher, 2013). In simpler words, LMS carries the concepts of 'learning portals, distributed learning systems, content management systems, course management systems and online learning platforms' (Ahmed and Mesonovic, 2019, p. 582). The LMS has been well-known of its flexibility in learning, timesaving, universal and cost-efficient, as stated by Fernando et al. (2008) and Park and Choi (2009). It diversifies learning by attending to diverse learners' needs and levels of education in e-learning (Bervell and Arkorful, 2020; Saidi et al., 2021).

In this study, the LMS was used as a central point for learning where it provided the learners with the much-needed learning resources (video, audio, images, animation, reading texts and etc.) in addition to lecture sessions on Microsoft Teams app. Students downloaded notes for lectures, streamed video and audio clips for assigned tasks in listening and speaking, completed online quizzes for English Grammar, read and recognized Simple Sentences and safety-related phrases of the Standard Marine Communication Phrases (SMCP). Hence, as posited by Davis and Tesh (2022) that more research is needed for LMS as a motivating factor, there was a need to investigate further the motivational factors of the LMS as a tool for learning Maritime English.

2. Methods

This quantitative research used a quasi-post-test experimental design as proposed by Shadish, Cook and Campbell (2002). The sampling technique of respondents involved total sampling that included the entire class of future merchant ship crew members at a premier maritime institution in Malaysia (32 respondents in total). They were undertaking a 5-month preparatory course to become merchant ship crew members which was conducted via ODL mode due to the Covid-19 pandemic. This research took place during the 3-week course of Maritime English which had been rebranded as the Ratings' Maritime English. 32 sets of questionnaire had been distributed via WhatsApp link to all student respondents in class. However, only 26 responded (81.25%) at the closure period of data collection.

For questionnaire design, this study adopted the Instructional Material Motivational Survey (IMMS) questionnaire which had been developed by Keller (2006). The full questionnaire of the IMMS is attached in Appendix 1 for further reference. A reliability and validity test on the questionnaire resulted in a Cronbach's Alpha value of 0.788 for all 36 items that had been tested. By default, Keller's IMMS has an Alpha value of 0.950, which is very high and reliable. Nunnally (1978) proposed a high value of 0.7 for research reliability and validity and hence, the value for this research was higher than Nunnally's proposal (1978). Table 1 below presents the Cronbach's Alpha value for the survey questionnaire in this study.

Data was collected once, after respondents underwent 3 online modules of the Ratings' Maritime English on the institution's LMS platform. The modules

Table 1. Cronbach's alpha value for survey questionnaire

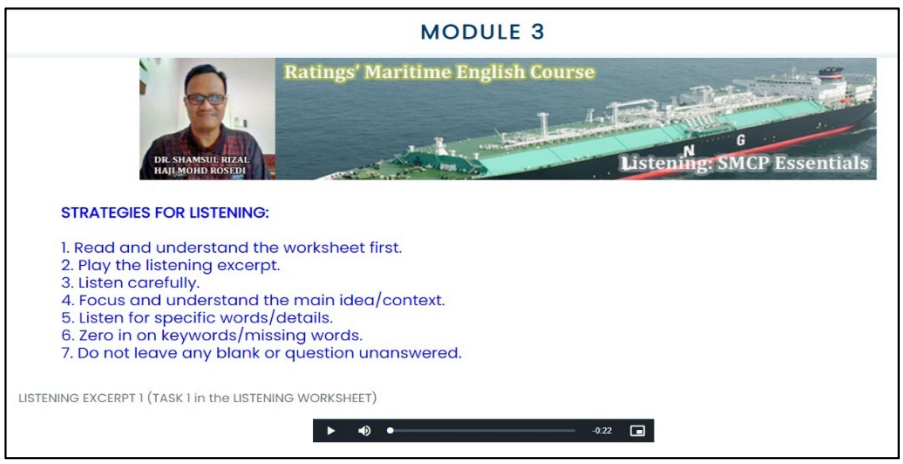
N	Items	Cronbach's α
26	36	0.788

were Basic English Grammar, English Sentences, and Introduction to SMCP and consumed 6 hours of total access time in asynchronous mode (independent access) to be completed by all respondents. This was the first time for LMS to be used in the Ratings' Maritime English course which had been conventionally taught in the pre Covid-19 pandemic period. All respondents were not informed of the intended survey either at the beginning or after the completion of all modules. This was done with the intention of maintaining the focus on LMS (learning), rather than on the survey/experiment. Figure 1 below shows one of the LMS modules used in this study (Module 3 – Listening for SMCP).

The main objective of this research is to measure the motivational features of Ratings' Maritime English LMS. In other words, the study aspires to identify and measure learners' motivation level when they used the LMS for their online Maritime English class, without any intervention by the lecturer himself. The other objective is to look at correlational relationships that may exist among motivational characteristics and domains used in the study. Therefore, to be more conclusive and to further guide the direction of research in this study, the following research questions have been developed.

1. What was the overall level of motivation of ship crew students when they underwent the Maritime English lessons via the LMS?
2. Is there any significant relationship between good organization of LMS content with learners' confidence?
3. Is there any significant relationship between the layout of LMS with learners' enjoyment learning the lesson?
4. Is there any significant relationship between the variety of reading passages, exercises, and materials with learners' satisfaction?

Figure 1. LMS module 3 on listening: SMCP essentials.



LMS, learning management system; SMCP, standard marine communication phrases.

Based on the above, there are four areas that need to be investigated by this study. Hence, the following section presents the outcomes of the study based on the enquiries as established above for further evaluation and understanding. The discussion section will further clarify the findings which leads to the conclusion of the study.

3. Results

This section presents the analyzed data in the form of results according to respective research objective and hypotheses as stated in No. 1–No. 4 of the previous section. Even though data were obtained from only 26 respondents, it represented 81.25% of the target population (total sampling). As it was meant to have total sampling for the survey, it is unfortunate to assert that 6 respondents were unable to respond due to personal and technical difficulties. However, the total sampling technique used was still considered relevant. The age range of respondents was between 19–25 years old, and they came from all over Malaysia. All students were self-paid candidates, and this was the first batch of such learners since 2018 being admitted into the academy. During the experiment and survey duration, all 26 respondents were based at their respective homes, not on campus due to the Covid-19 pandemic.

Research Question 1: What was the overall level of motivation of ship crew students when they underwent the Maritime English lessons via the LMS?

Table 2 below presents the findings for Research Question 1 which aimed to evaluate respondents' level of motivation when using the LMS for Maritime English lessons. The findings provide a straightforward answer to this research question. The IMMS questionnaire has 36 questions which are attributed to the four domains of Keller's ARCS Model of Motivation, namely Attention, Relevance, Confidence and Satisfaction (ARCS). But the questions are not equally distributed among all domains in the ARCS Model of Motivation. Attention consists of 12 questions while Relevance has 9 questions altogether. Meanwhile, Confidence has 9 questions and the last domain, Satisfaction, is left with only 6 questions. These questions are randomly arranged in the questionnaire by Keller (2010) to reduce the effect of question familiarization and also for acquiescent purposes.

Table 2 above lists down all motivational domains as tested in the IMMS questionnaire, the number of questions that are attributed to specific domain and most importantly, the total mean scores for all questions in each particular domain. The highest score was obtained by the *Satisfaction* domain with a mean of 4.10 (6 questions). The lowest score was demonstrated by the *Confidence* domain with a

Table 2. Respondents' level of all domains in the ARCS model

Dimension	No. of questions	Total mean scores
Attention	12	3.97
Relevance	9	3.94
Confidence	9	3.73
Satisfaction	6	4.10

ARCS, attention, relevance, confidence and satisfaction.

mean of 3.73 (9 questions). The other two motivational domains, *Attention* and *Relevance* had mean scores of 3.97 (12 questions) and 3.94 (9 questions) respectively. However, suffice to mention here the lowest and highest means or the range of means that were scored by all items for better understanding. For the *Attention* domain, the lowest and highest mean scores were recorded as 3.73 and 4.38 respectively. This means that the range of mean scores for this domain was between 3.73 to 4.38. As for *Relevance*, the range of mean scores was recorded from 3.88 (lowest) to 4.15 (highest) while *Confidence* recorded 3.23 (lowest) to 4.04 (highest) for all the questions. The last domain, *Satisfaction*, was found to be between 3.92 as the lowest mean score, to 4.38 as the highest mean score.

The total mean scores and also the range of scores obtained by all domains support that the levels of student motivation investigated in this study were identified at medium to high level of performance. Three domains fell under the medium level (mean score<4.00). They were the attention, relevance and confidence, domains while only one domain, which was Satisfaction, fell under the high level of acceptance (mean score>4.00). These findings helped to answer Research Question 1 that the overall level of motivation of ship crew students was found at medium to high level when they underwent the Maritime English lessons via the LMS.

Research Question 2: Is there any significant relationship between good organization of LMS content with learners' confidence?

To answer Research Question 2, the researcher used Pearson Product Moment correlation to investigate the relationship between good organization of LMS content with learners' confidence. Table 3 below explains further the correlation as being investigated.

From Table 3 above, the results indicated that the calculated r-value of 0.588 is greater that $p=0.000<0.01$. This showed that there was a significant positive relationship between good organization of LMS content and learners' confidence in the study. The finding suggests that the better organization of LMS content will result in higher confidence of the learners. Indeed, this is a crucial feedback that must not be taken lightly but must be further considered in the improvement of LMS content in near future. Hence, it is asserted here that the

Table 3. Pearson (r) statistics showing the relationship between good organization of LMS content with learner's confidence

Variables	N	Mean	SD	Cal. r	*p*–value
Good organization of LMS content	26	4.52	.701	.588*	0.000
Learner's confidence	26	4.32	.806		

*Sig. at $p<0.01$.
LMS, learning management system.

relationship between the good organization of LMS content and learners' confidence is found to be positive and significant.

Research Question 3: Is there any significant relationship between the layout of LMS with learners' enjoyment learning the lesson?

To answer Research Question 3, like the previous Research Question 2, the researcher used Pearson Product Moment correlation to test whether or not, there is a relationship between the layout of LMS with learners' enjoyment learning the lesson. Table 4 below presents the related finding for better discussion.

From Table 4, the results indicated that the calculated r-value of 0.46 is greater that p=0.000<0.01. This showed that there was a significant positive relationship between the layout of the LMS with learners' enjoyment learning the lesson, as investigated in this study. This suggests that any improvement in the layout of LMS will result in more enjoyment of the learners' to learn the lessons. Therefore, to answer the question, it is asserted here that the relationship between the layout of the LMS and learners' enjoyment learning the lesson is positive and significant.

Research Question 4: Is there any significant relationship between the variety of reading passages, exercises, and materials with learners' satisfaction?

For answering this question, the same Pearson Product Moment Correlation was selected. There was a need to look at the relationship between the variety of reading passages, exercises, and materials with learners' satisfaction for this study. Table 5 below presents the finding for better discussion.

Table 4. Pearson (r) statistics showing the relationship between the layout of LMS with learners' enjoyment learning the lesson?

Variables	N	Mean	SD	Cal. r	*p*–value
The layout of LMS	26	4.45	.708	.460*	0.000
Learners' enjoyment learning the lesson	26	4.47	.699		

*Sig. at $p<0.01$.
LMS, learning management system.

Table 5. Pearson (r) statistics showing the relationship between the variety of reading passages, exercises, and materials with learners' satisfaction

Variables	N	Mean	SD	Cal. r	*p*–value
Variety of reading passages, exercises, and materials	26	3.96	.958	.435*	0.000
Learners' satisfaction	26	4.38	.804		

*Sig. at $p<0.05$.

From Table 5, the results indicated that the calculated r-value of 0.435 is greater that p=0.000<0.05. This proved that there was a significant positive relationship between variety of reading passages, exercises, and materials on the LMS and learners' satisfaction in the study. The finding also suggests that if there are more reading passages, exercises, and materials being included on the LMS of Ratings' Maritime English, the learners will be more satisfied with the lesson. Hence, in answering this research question, the finding has proved that there is a significant positive relationship between the variety of reading passages, exercises, and materials with learners' satisfaction.

4. Discussion

The findings of Research Question 1 show that the level of respondents' motivation when using the LMS in learning Maritime English was at medium-high level. This was a good indicator in a such preliminary study on motivation and usage of LMS in the MET which had been relying on conventional face to face methods in the pre-pandemic period. Suffice to mention that the respondents were freshmen who were first time users of LMS and there could be many factors affecting their access to LMS modules and interactive materials. Accordingly, the grand mean scores of all motivational domains in Keller's ARCS Model of Motivation were all above 3.50 (>3.50) which ranged from 3.73 to 4.10. Confidence gained a grand score of 3.73, which was the lowest of all four domains. This was logical since all respondents were not only first-time users of LMS, but also first timers in going through online classes and Maritime English lessons. On the other hand, Relevance came with a much better grand mean of 3.94, which signified that to some extents, respondents had significantly related the lessons with job requirements on board of merchant ships. Next, the domain of Attention obtained a higher grand mean of 3.97, which was the closest to the high level of motivation. Moreover, this domain had the highest number of questions (12 questions altogether) and the high grand mean score proved that the LMS, to some extents, had successfully gained the attention of respondents in this study. Most of this had been attributed to the rich multimedia content (video and audio clips),

layout, graphics, and images together with exercises that could reinforce learners' understanding of the subject matter (Maritime English). Most importantly, the last domain in Keller's ARCS Model of Motivation which was satisfaction, summed up the experiment and study with a very significant result. The domain of satisfaction proved to gain the highest grand mean score of all motivational domains in the study with 4.10 (mean score>4.00). This concluded the study with the notion that despite all the challenges and new experience in online learning, especially in using the LMS, all learner respondents recorded high level of satisfaction when using the LMS for learning Maritime English. This provides conclusive evidence that LMS could be used not only to achieve the learning objectives of lessons, but also to attract learners' attention, provide relevant content with the industry, help them to build up confidence and finally, lead to the feeling of contentment (satisfaction) at the end of lessons/module.

The finding of Research Question 2 (Hypothesis 1) had pointed out that there was a significant relationship between the good organization of LMS content with learners' confidence. The r-value for Pearson Correlation of .588 showed a strong relationship and hence, it can be concluded that the learner respondents in this study gained confidence from the systematic arrangement of content, which were the reading passages, lessons, exercises together with multimedia content which had been specifically developed and included to the lesson proper and its learning objectives. Furthermore, the excitement of accessing LMS and going through the lessons in their own pace provided learner respondents with the opportunity to complete the learning tasks according to their own learning pace. This personalized learning helped them to build the needed confidence not only in successfully completing the tasks but also in mastering the skills as planned such as the basic marine vocabulary (BMV), basic marine sentences (BMS) and ultimately, Part B of IMO SMCP.

For Research Question 3 (Hypothesis 2), it was proven that the null hypothesis had been rejected due to significant correlation between students' active class participation with student engagement. The r-value of Pearson Correlation of .460 showed a significant relationship between the two variables. This further supports the 100% completion of lessons (all three Maritime English modules) within the stipulated period, even though there was not close supervision by the lecturer/researcher for that particular access period (class hours and extended class hours). Majority of learner respondents had repeatedly gone through the lessons/modules, and they kept on highlighting and sharing their experience in group discussion. This had also increased interaction with peers and with the lecturer/researcher and brought to the conclusion that they were engaged in their lessons by their access to the LMS.

Lastly, the Research Question 4 (Hypothesis 3) had also resulted in the rejection of null hypothesis as there was a significant correlation between variety of reading passages, exercises, and materials with learners' satisfaction. A significant r-value of Pearson Correlation of .435 proved that all respondents in

this study were satisfied with the sufficient coverage of lesson whereby the reading passages, exercises, and materials (audio, video clips) had helped them to successfully complete the modules and achieve the intended learning objectives either in mastering BMV or BMS, shipping, and maritime terminologies and also Part B of the IMO SMCP (on-board safety related phrases).

5. Conclusion

From the results of this study and also from the discussion held earlier, it is obvious that the level of student motivation was at medium-high level when they used LMS in learning Maritime English during their online classes in February 2022 (3 weeks of intensive mode). Even though the number of respondents was relatively small, but it has involved the whole class of future merchant ship crew members. The LMS for teaching Maritime English to these future merchant ship crew members had been designed and developed within the framework of Keller's ARCS Model of Motivation and as such, the assessment tool used in evaluating the level of motivation came from the same model (the IMMS-Instructional Materials Motivation Survey). To the extreme point, it can be concluded that the result of studies, which was the medium-high level of motivation could be attributed to all elements/domains of the ARCS that had been used to develop the LMS. As such, it is not too much to assert that the results that were obtained had been much anticipated earlier.

The elements of ARCS had been thoughtfully considered and used to develop the LMS in this study and it is not surprising to note that the results were not that far from the results that had been aspired by Keller (2006). Keller (2006) proposed the level between medium-high to high level of motivation if the ARCS Model of Motivation had been carefully used and implemented in the design and development of lessons. Hence, it can be concluded also that the results were in conjunction with the anticipated outcomes as proposed by Keller (2006). However, the medium-high level as indicated by respondents in this study needs to be further investigated and explained as there may be other unknown underlying factors yet very significant to be discovered. It is also proposed that more related studies in this capacity could be conducted in order to arrive at more solid knowledge and findings. But all in all, this study has added significant findings to the existing body of knowledge in using LMS in ODL. Hopefully, they will assist other MET institutions in developing and using LMS in the teaching and learning of STCW.

6. Limitations of Study

Besides the results that have been obtained by this study, there were also a few limitations that were faced by the researcher that are worthwhile to be highlighted. A research is not complete without highlighting the limitations in terms of survey method, number of respondents, lesson coverage and also extended population/location of research. As this study is considered an inaugural research on the use of LMS in motivating learners in learning Maritime English and also the first of its kind in the MET in Malaysia, suffice to mention that it is proposed for future similar research to add a qualitative study to complement the findings from quantitative method. In other words, interviews should be conducted to obtain better insights and understanding on learner respondents' perception and experience in using the LMS. This could better support the findings either the level of motivation, correlations and even the factors associating with the obtained results. In addition, the immediate feedback from respondents during interviews provide straightforward responses on their motivation in accessing the LMS. Words and phrases associated with ARCS are easily identified and documented and they are very useful in supporting and reinforcing the quantitative findings. Hence, the findings could be of holistic in nature and explain further the situations and circumstances that may not be captured by the research questionnaire.

It is also hoped that the future related studies could increase the number of participants/respondents in order to increase the reliability of the results. As the study was conducted during the pandemic on a small class of future deck crew members (32 respondents but only 26 valid), the results could not be generalized and applied in larger classes (>40 respondents) or even batches (>100 respondents). Hence, an immediate suggestion is to conduct the same study on future navigation officers or engineering officers in order to gain better results, whereby the number of each pass surpasses 100. Perhaps this way could deliver more conclusive and valid results on the motivating factors that LMS could provide when learning Maritime English. One good thing to emphasize here is that the subject of Maritime English is compulsory to both crew and officers in the shipping/maritime industry and hence, it is crucial to warrant a larger scale study for better conclusive results.

The next limitation to be considered is the number of modules/lessons on the LMS. As this study had involved only three topics namely *Basic English Grammar, English Sentences,* and *Introduction to SMCP*, it is strongly recommended that the future similar research to include other important topics such as the *Types of Merchant Vessels*, *Shipboard Organization and Safety on-Board* in order to evaluate the strengths and weaknesses of the said LMS in reinforcing learning. More topics will create more variables, reactions, and diversified experience since difficulty in learning is also attributed to the complexity of topic/content of lesson. This will provide more diversity in learning experience and level of understanding thus generate more feedback on the strengths or weaknesses

of the LMS in motivating further the learner respondents.

The last limitation in this study is the about the extended location/ population of research. Besides the current location, it is advisable for future similar research to include other maritime institutions and different groups of learner respondents as well. This will increase the reliability and validity of the research especially the results obtained as the number of institutions and population increases, the diversity of feedback and results also increases. As the coverage has been extended, the study can also be increased in its acquiescence and independence as learner respondents are not familiar with the researcher/ lecturer and the feedback obtained will be solely based on the research but not on the impact from researcher/lecturer intervention or influences. As for the number, again, more diversified population will provide more diversified feedback. This will further provide more insights and understanding on learners' motivation, the lessons, the LMS and even the student engagement as there are larger factors and variables to be considered, involved, and studied.

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