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An Innovative Digital Self-Learning Model for Training and Education in the Philippines: Basis for a Proposed Policy in Accrediting Electronic Training Record Book (E-TRB)

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Abstract

Purpose: *This study aims to explore the readiness and utilization of e-learning platforms among maritime students in the Philippines.*

Approach/Design/Methodology: *Employs a descriptive-correlational research method utilizing a quantitative approach. A researcher-made instrument, duly validated, was used to survey 383 maritime students across the three major regions of the country. Discussion among colleagues in the maritime industry, heads of MHEIs, and CHED generates comprehensive information that provides a basis for recommendations. The analysis utilized means and standard deviations for descriptive data and Pearson r for inferential data, with an alpha level set at .05.*

Findings: *It was found that students have a high level of readiness and acceptance of digital learning tools. A user-friendly and intuitive learner interface compatible with different devices is the main feature of the students' desired e-TRB. Furthermore, it emphasizes the vital role of institutional support and strategic implementation in enhancing e-learning effectiveness in maritime education, which is essential for policymakers and educators aiming to advance the digital learning infrastructure in the maritime sector, supporting current trends in education.*

Research Implications: *This study contributes to the growing body of literature on digital learning in maritime education by demonstrating that Filipino maritime students exhibit a high level of readiness and acceptance of e-learning platforms. This suggests that future researchers can delve deeper by examining its long-term impact on student performance and competency development in optimizing digital learning tools, such as the e-Training Record Book (e-TRB). Additionally, to explore the role of institutional support mechanisms in sustaining engagement and addressing potential challenges in e-learning adoption within the maritime industry.*

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Practical Implications: *Institutions should focus on enhancing and increasing familiarity and utilization of various digital self-learning platforms, as well as leveraging high acceptance and readiness. Policies can further integrate diverse e-learning tools into the curriculum, capitalizing on these high levels of acceptance and readiness. Lastly, promoting the effectiveness of e-TRB by highlighting its high perceived effectiveness can further enhance its use and acceptance among students.*

Keywords:

Maritime Education in the Philippines, e-TRB, Digital Readiness, Self-learning Platform.

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1. Introduction

In the dynamic landscape of the 21st century, education and training in the maritime sector have drastically evolved. Propelled by the global COVID-19 pandemic, which heightened the use of blended and fully digital innovations in teaching and learning, the maritime industry must take a step forward in digitalization. As a highly technical profession, it is imperative for the sector to review necessary training documents, such as the Training Record Book (TRB), to align with international standards and modern innovations.

The growing number of Filipino seafarers highlights the nation's strong presence in the global maritime labor market. These seafarers frequently serve on ships with diverse international crews, navigating complex interactions between local labor laws, global maritime operations, and their cultural backgrounds. Many works under European officers aboard vessels registered under flags of convenience, often owned by Western or Japanese entities (Acejo, 2021). To remain competitive, the Philippines must enhance the quality of maritime education and training, ensuring a steady supply of highly skilled seafarers. The involvement of international entities in shaping policies for Filipino seafarers further underscores the country's substantial impact on the global maritime industry (Maido, 2021; Turgo, 2021).

In response to these demands, this research seeks to establish a clear policy framework for the use of digital e-learning methodologies in maritime education and training, particularly concerning shipboard training for cadets. It aims to eliminate ambiguity, inconsistency, and disunity in the integration and implementation of digital learning tools. Specifically, this study proposes a framework for a self-learning electronic Training Record Book (e-TRB) that Filipino seafarers can utilize in the future.

This study is anchored in the theoretical framework of four digital learning spaces: Individual Space, Working Group, Community of Interest, and Open Connections (Dalsgaard & Ryberg, 2023). These frameworks illustrate how digital technologies serve as cognitive partners, collaboration tools, sharing platforms, and network connectors. Technology enhances an individual's cognitive abilities rather than replacing them. It also strengthens collaborative knowledge-building within working groups, facilitates access to collective knowledge, and expands students' interaction with the global community through networked connections.

To support these innovations, regulatory frameworks must adapt accordingly. The Commission on Higher Education (CHED) and the Maritime Industry Authority (MARINA) implemented Memorandum Circular No. 1, series of 2023, emphasizing the significance of proper training records and onboard training (JCMMC 01 s. 2023). With the increasing Adoption of digitized and innovative educational materials, the Philippine maritime sector has begun integrating electronic formats and Information, Communication, and Technologies (ICT) into training. To align with these advancements, policymakers should approve the use of e-TRBs for cadets' Onboard Training (OBT).

The competence of engine officers plays a crucial role in ensuring safety and environmental protection. The updated International Shipping Federation (ISF) Book enables cadets and their companies to systematically monitor and evaluate onboard training in accordance with the new STCW Convention requirements. A training record book is a mandatory tool for trainees aiming to qualify as ship officers, as it provides structured evidence of onboard training (ICS, 2013).

Thus, this study aims to formulate a policy supporting an innovative digital self-learning model for Standards of Training, Certification, and Watchkeeping (STCW) training and education in the Philippines. It seeks to assess: Maritime students' familiarity with and utilization of the self-learning platform, their acceptance of the platform, and their readiness in using e-learning tools, particularly in a) Self-directed learning, b) Motivation for learning, c) Learner control, d) Computer/internet proficiency, and e) Interaction with other learners.

Additionally, this study will determine the preferred features of the e-TRB among maritime students, their perceived effectiveness in using the e-TRB, and the level of readiness among maritime industry stakeholders to adopt technological innovations in education and training. Finally, the study will examine the relationship between students' familiarity, utilization, acceptance, and readiness in using self-learning platforms and their perceived effectiveness in using the e-TRB. Based on these findings, a policy for accrediting the e-TRB will be recommended to MARINA.

2. Methodology

This study employed a descriptive-correlational research design with a quantitative approach, utilizing a survey. The respondents were 383 randomly selected Maritime students enrolled in the year 2022 from MHEIs randomly located in various regions in the Philippines. The researcher used a researcher-made instrument to gather the data needed for this investigation. The items were crafted personally by the researcher with several inputs from the industry partners. The research instrument is divided into five sections that include:

1. Familiarization and Utilization of self-learning platform,

2. Acceptance of self-learning platforms,

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3. Readiness in using self-learning platforms,

4. e-Training Record Book (e-TRB) design,

5. Perceived Effectiveness in using the e-Training Record Book,

6. Readiness and Adaptation of Maritime Industry stakeholders (students) to technological innovation in education and training.

Discussions with key maritime industry stakeholders—including the Maritime Industry Authority (MARINA), the Commission on Higher Education (CHED), shipping companies, and MHEI representatives—provided additional insights that served as the basis for policy recommendations regarding the accreditation and Adoption of the e-TRB. Validity and reliability testing were conducted to ensure the instrument was valid and reliable, with a validity index of .871 and an alpha coefficient (Cronbach's alpha) of .988.

As to data gathering, permission was requested from the school administrator or the president concerned to allow the researcher to gather data for this study. Upon approval, the researcher sends a link to the Google form to the focal person, who distributes it among their maritime students. As soon as the target number of respondents was reached, the online survey was closed. The data was sent to the statistician for processing. All data were subjected to statistical treatment and analysis using the Statistical Package for the Social Sciences (SPSS) software, version 21. Privacy and confidentiality were observed in adherence to the Data Privacy Act. The students' names were not disclosed, and they remained anonymous. Access to the data was exclusive only to the researchers and data analysts. The analysis utilized means and standard deviations for descriptive data and Pearson's r correlation for inferential data, with an alpha level set at .05.

3. Results

3.1. Familiarity and utilization of Self-Learning Platform

The data in Table 1 indicate that the familiarity and utilization of LinkedIn Learning, Coursera, Udacity, and SkillShare are moderate, with mean values of 2.93, 2.87, 2.76, and 3.07, respectively. The school's LMS has the highest utilization, with a mean of 3.31 and a standard deviation of 1.14.

Table 1: Level of maritime students' familiarity and utilization of Self-Learning Platform.

Digital Self-Learning Platform	Mean	SD	Interpretation
LinkedIn Learning (formerly "Lynda")	2.93	1.17	Moderate
Coursera	2.87	1.19	Moderate
Udacity	2.76	1.19	Moderate
SkillShare	3.07	1.11	Moderate
School's Learning Management System (LMS)	**3.31**	**1.14**	**Moderate**

3.2. Readiness in using the e-Learning Platform

As shown in Table 2, maritime students across the Philippines exhibit a high level of acceptance for e-learning platforms, with an aggregate mean of 3.73 and a standard deviation of 0.793. The mean scores fall within the high range, indicating strong acceptance and readiness.

Table 2: Maritime students' level of acceptance in using the e-Learning Platform.

Acceptance of using the e-Learning Platform	Mean	SD	Interpretation
As a Whole	3.73	0.793	High

Moreover, Table 3 evaluates various aspects of readiness among maritime students across different regions of the Philippines. Self-directedness showed the highest mean (M = 3.69), followed by Proficiency in using computers and internet proficiency (M=3.67) and motivation (M = 3.55), which indicates a strong intrinsic motivation to engage with e-learning platforms. Lastly, Students' ability to control the pacing of their courses (M = 3.53) and interaction with other learners (M = 3.53). This indicates that student are comfortable managing the speed of their learning and are more engaged in collaborative learning.

In general, maritime students in the Philippines

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demonstrate a high (M=3.60) level of readiness across various aspects of using e-learning platforms. The standard deviations (SD = .63) are relatively low, indicating consistent responses within each category and region. The overall interpretation for all aspects remains high, suggesting that maritime students are well-prepared and positive about engaging with e-learning platforms.

Table 3: Maritime students' level of readiness in using the e-Learning Platform.

Readiness in using the e-Learning Platform	Mean	SD	Interpretation
Self-directedness	3.69	0.74	High
Motivation	3.55	0.71	High
Proficiency in Computer/Internet	3.67	0.76	High
Control in Pacing the Course	3.53	0.74	High
Interaction with other Leaders	3.53	0.75	High
As a Whole	**3.60**	**0.63**	**High**

3.3. The most preferred features of the proposed e-Training Record Book

Table 4 presents the most preferred features of the proposed e-training record book for maritime students, arranged in descending order. User-friendly and Intuitive Learner Interface is the most popular among students, indicating a high value placed on ease of use and intuitive design, followed by Responsive Design (Compatibility with Different Devices), highlighting the importance of accessibility across different platforms, Variety in Learning Resources and Methods, showing a preference for a rich and varied learning experience. Next are the Automated Learning Journeys, Chat/Messaging, Mobile Compatibility, Free Access, AI learning, Collaboration, and Social Learning Tools (Discussion Boards). E-certification is the least emphasized feature, suggesting that while recognized, it is not as critical to students compared to other features. In general, the data support the notion that maritime students value usability, accessibility, and diverse learning resources in their e-learning platforms. The emphasis on fundamental features over advanced ones suggests a need to strike a balance between innovation and practical functionality to enhance the overall learning experience.

Table 4: Features of the e-Training Record Book.

Features of e-TRB	f	Rank
User-friendly and intuitive learner interface	231	1st
Responsive design (compatibility with different devices)	189	2nd
Variety in learning resources and methods	137	3rd
Automated learning journeys	75	4th
Chat/messaging	66	5th
Mobile	64	6th
Free	58	7th
AI-learning	45	8th
Collaboration and social learning tools (Discussion boards)	42	9th
E-certification	36	10th

3.4. Level of effectiveness in using the e-Training Record Book

The data in Table 5 indicate that maritime students across different regions in the country uniformly perceive the e-Training Record Book as highly effective. The overall mean score of 3.80, interpreted as high, suggests that students generally find the e-TRB to be an effective tool in their training. The low standard deviations across the board reflect consistent responses, reinforcing the high level of perceived effectiveness of the e-TRB among maritime students.

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Table 5: Maritime students' perceived level of effectiveness in using the e-Training Record Book.

Effectiveness in using e-TRB	Mean	SD	Interpretation
As a Whole	3.80	0.74	High

Maritime Industry stakeholders have a high level of readiness and adaptation to technological innovation, with a mean of 3.78 and a standard deviation of .74, as shown in Table 6. This implies that students are ready to adopt the use of e-TRB as a form of innovation appropriate for the current trend in education and training.

Table 6: Maritime industry stakeholders' level of readiness and adaptation to technological innovation in education and training.

Level of Readiness and Adaptation to Technological Innovation	Mean	SD	Interpretation
As a Whole	3.78	0.74	High

3.5. Relationships between the students' level of familiarity and utilization, acceptance, and readiness in using the Self-learning Platform, and the perceived effectiveness of using the e-TRB

Table 7 illustrates the strongest correlation (r = 0.763) between students' readiness and perceived effectiveness in using the e-TRB, with readiness accounting for approximately 58.2% of the variance in perceived effectiveness, making it the most influential factor. This highlights the importance of ensuring students are well-prepared to use e-learning platforms. Thus, policies should prioritize building comprehensive readiness through technical support, training, and resources that enhance students' skills and confidence in using these platforms.

Approximately 46.9% of the variance in acceptance is explained by perceived effectiveness, with a strong positive correlation (r = .685) between students' acceptance of self-learning platforms and their perceived effectiveness of the e-TRB. It is essential to strengthen a positive attitude and trust among students.

Lastly, it shows a moderate positive correlation (r = 0.382) between students' familiarity and utilization of self-learning platforms and their perceived effectiveness of the e-TRB, with only about 14.6% of the variance in perceived effectiveness being attributed to familiarity and utilization.

Table 7: Relationships between the students' level of familiarity and utilization, acceptance, and readiness in using the self-learning platform, and the perceived effectiveness of using the e-TRB.

Variable	Mean	r	r^2	p-value	Interpretation
Familiarity and Utilization	3.26	0.382	0.146	0.000	Significant at 0.05 alpha level
Perceived Effectiveness	3.80				
Acceptance	3.73	0.685	0.469	0.000	Significant at the 0.05 alpha level
Perceived Effectiveness	3.80				
Readiness	3.60	0.763	0.582	0.000	Significant at the 0.05 alpha level
Perceived Effectiveness	3.80				

4. Discussion

Maritime students demonstrate a moderate familiarity and utilization of various digital self-learning platforms. The most commonly used and familiar with is the school's Learning Management System (LMS), suggesting an institutional preference or requirement compared to the platforms (e.g., LinkedIn Learning, Coursera, Udacity, and SkillShare) which are slightly utilized.

Students have a high level of readiness for e-learning in

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terms of acceptance, indicating their preparedness and positive attitude toward engaging with digital learning technologies.

When it comes to platform preferences, most of the maritime students preferred a user-friendly interface and responsive design in the proposed e-Training Record Book (e-TRB). This indicates that they value the importance of accessibility, ease of use, and diverse learning resources, as well as interactive features and communication tools (e.g., chat and messaging) that facilitate engagement and collaboration. Although AI-driven learning and e-certification features rank lower in priority, this suggests that while students are open to innovation, they currently emphasize fundamental usability and accessibility.

Regarding effectiveness, maritime students across different regions uniformly perceive the e-TRB as highly effective in their training. The low standard deviations in responses reflect a strong consensus, reinforcing the platform's reliability and usefulness in maritime education. Popa and Cupsa (2019) highlight the advantages of using e-learning platforms and how distance education can solve many problems, saving time and also increasing efficiency on board for seafarers.

Maritime industry stakeholders, especially the students, demonstrate a high level of readiness for and adaptation to technological innovations. It means that students are prepared to adopt the e-TRB as an innovative tool for learning.

Furthermore, significant positive relationships were observed between familiarity, utilization, acceptance, readiness, and the perceived effectiveness of e-learning platforms. It underscores the importance of ensuring that students are well-equipped to use these tools effectively and enhancing familiarity and utilization through training and curriculum integration to build a comprehensive readiness through technical support and resource development.

4.1. Proposed policies for accreditation of the e-TRB

The proposed policies aim to enhance familiarity, acceptance, and readiness among maritime students in using the e-TRB, as well as improve its perceived effectiveness and overall utilization in maritime education and training. The proposed policies are the following:

1. **The Administration:**

   ✓ Ensure that all maritime students receive adequate training and resources to become familiar with and effectively use the e-TRB.

   ✓ It should promote the acceptance of the e-TRB by communicating its benefits and integrating it seamlessly into the learning and assessment processes.

2. **The Shipping Companies:**

   ✓ Should provide support and encouragement for using the e-TRB among trainees, ensuring it is recognized and valued as a valid training record.

   ✓ Should collaborate with educational institutions to align the use of the e-TRB with industry standards and requirements.

3. **The Commission on Higher Education:**

   ✓ The Commission on Higher Education may endorse and mandate the use of the e-TRB across all maritime education institutions to standardize training records.

   ✓ As well as provide guidelines and support for the implementation and continuous improvement of the e-TRB system.

4. **The Maritime Higher Education Institutions (MHEIs):**

   ✓ MHEIs should incorporate the e-TRB into their curriculum and ensure that faculty are trained to assist students in its use

   ✓ and continuously monitor and evaluate the effectiveness of the e-TRB by making necessary adjustments based on feedback from students and industry partners.

Implications for policy and practice

1. **Enhancing the utilization of e-TRB based on the level of acceptance and Readiness**

   ✓ Policies should leverage the high acceptance and readiness levels to further increase familiarity and utilization of various self-learning platforms beyond the existing LMS.

2. **Institutional Integration**

   ✓ Institutions should continue to integrate and promote the use of the LMS while also encouraging the use of other self-learning platforms to diversify and enrich students' learning experiences.

3. **Improving Familiarity**

   ✓ Training and support programs can be designed to improve familiarity with platforms like LinkedIn Learning, Coursera, Udacity, and SkillShare, given their moderate current levels of utilization.

4. **Leveraging Perceived Effectiveness**

   ✓ The high level of perceived effectiveness of the e-TRB may be emphasized in communications and training sessions to further boost students' engagement and utilization.

5. Conclusion

Maritime students have a high level of utilization of their school's LMS; however, a moderate level of familiarity and utilization of other platforms. This implied that it is necessary to create opportunities for them to be more flexible and technology-driven. Despite moderate engagement on the other platforms, students still exhibit high levels of acceptance and readiness for digital self-learning, especially on the e-TRB. Significant positive relationships exist between familiarity, utilization, acceptance, readiness, and the perceived effectiveness of e-learning platforms, underscoring their importance in enhancing the learning experience.

Given these findings, maritime higher education institutions should implement the following in order to foster a more dynamic and effective digital learning environment for maritime students such as

1. Enhance Training Programs to improve students' Proficiency with various digital self-learning platforms,

2. Diversify E-Learning Tools – to promote a wider range of platforms beyond the LMS to enrich learning experiences,

3. Advocate for e-TRB Adoption – to conduct awareness campaigns highlighting the benefits of e-TRB to encourage its broader use,

4. Establish Feedback Mechanisms – to regularly assess and refine digital learning platforms based on student input to ensure continued effectiveness.

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