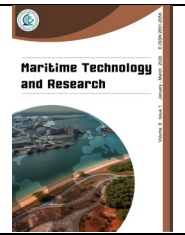




## Maritime Technology and Research

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Research Article

### Adoption of social media as a learning technology in maritime education

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Article information	Abstract
Received: July 8, 2025 Revision: September 18, 2025 Accepted: September 27, 2025	This study aims to investigate the factors influencing the intention to use social media for learning among maritime students. It examines and applies the Technology Acceptance Model (TAM) to examine key constructs such as perceived usefulness, ease of use, and enjoyment. The goal is to offer information that can guide the incorporation of social media into educational strategies in maritime and related fields. The study applies the TAM to explore students' intentions to use social media for learning. A questionnaire based on TAM constructs was administered to 104 maritime students at University Malaysia Terengganu. The data were analyzed to test hypotheses about the relationships among key factors, including perceived usefulness, perceived ease of use, and perceived enjoyment. The findings revealed that the most preferred social media platforms for learning are WhatsApp, YouTube, and Facebook. The model demonstrated a good fit, with seven out of nine hypotheses supported. However, perceived enjoyment did not significantly influence the intention to use or the attitude toward using social media for learning. The study is limited to maritime students at a single Malaysian university, which may affect the generalizability of the findings. Future research could explore diverse student populations and additional factors influencing social media adoption for learning. This study contributes to understanding how social media can be effectively integrated into educational practices. These insights provide practical guidance for designing learning models that leverage social media technologies to enhance educational outcomes.
<b>Keywords</b> Social media; Intention to use; Technology acceptance model; Maritime students; Higher education	

#### Abbreviations

TAM	Technology acceptance model
ITU	Intention to use
PEOU	Perceived ease of use
PU	Perceived usefulness
PE	Perceived enjoyment
JR	Job relevance
EXP	Experience
AOU	Attitudes of use
CMB	Common method bias

SD	Standard deviation
AVE	Average variance extracted
CR	Composite reliability
HTMT	Heterotrait-Monotrait ratio of correlations

## 1. Introduction

The rapid evolution of technology and internet applications based on mobile devices, apps, and tablet computing has led to the augmentation of social media (Jusubaidi et al., 2025). The impact of this expeditious advancement is transferring the postulation of socializing, as well as mobile computing and learning (Tan et al., 2025). The advent of social media worldwide has improved how people communicate and interact with each other; the predominant use of mobile devices such as smartphones, tablets, and laptops has modified the way they interact with educators and other learners, and how they access online materials, via social media (Alkhwaldi, 2024).

The motivation for this study is to propose a test model of undergraduate students' behavior in using social media for learning. There are several technology adoption theories employed by researchers, such as the theory of reasoned action, the theory of planned behavior, and the unified theory of acceptance and use of technology, including the Technology Acceptance Model (TAM). Among these theories, the TAM is the most common theory embraced in online learning research, as well as educational contexts (Stephen & Ritzhaupt, 2023; Yan et al., 2024). Therefore, the variables in this model were derived from the TAM, which is commonly used in the context of the intention to adopt technology. Hypotheses were formulated prior to testing the measurement and structural models.

## 2. Theory and literature review

### 2.1 Social media for learning

Merging social media usage and higher education helps bring both institutions and students closer (Aston, 2023). Blogs, wikis, YouTube, Facebook, and Twitter are some of the more common types of social media (Oyetola et al., 2023). Moreover, Facebook can be used to gather information or as a learning appliance (Ngoc Hoi, 2023), to connect students, and to circulate university culture (Yu et al., 2010). Wikis is especially useful in collaborative projects or as a blog interface for feedback and interactive learning (Qassrawi & Al Karasneh, 2023). YouTube is an example of social media that allows for the formation of social relationships that revolve around uploaded videos (Oyetola et al., 2023). With the increased speed and technological implications of the internet, social networking websites have developed swiftly, mostly among teens such as students, such as Myspace, Twitter, LinkedIn, and Facebook.

### 2.2 Social media in higher education

According to Vygotsky's theory, known as the sociocultural perspective, perceptual growth is determined by society and culture, and is not performed in separation (Lantolf & Poehner, 2023). Higher education has relocated its attention to online learning worldwide. The Malaysia Education Blueprint 2015 - 2025 (Higher Education) outlines 10 shifts that will ensure continued outstanding quality in the higher education system. As Malaysia presently has the seventh-highest internet penetration rate at 67 % in Asia, it is in a good position to utilize online learning to support the National e-Learning Policy (Dasar e-Pembelajaran Negara or DePAN) to intensify the quality of teaching and learning (Alkhwaldi, 2024). The 9th shift of this blueprint highlights the importance of online learning worldwide, as it focuses more on providing personalized learning experiences to all students (Pitono & Fauzi, 2025).

## 2.3 Social media

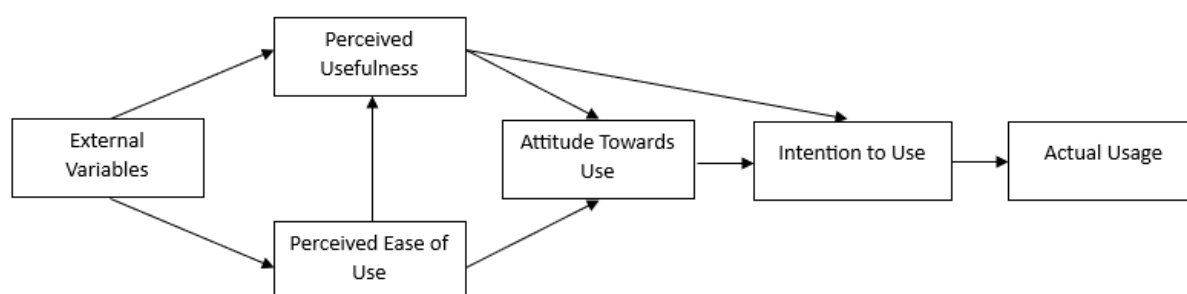
Social media is known as comprising websites and applications that enable users to create and share content or to participate in social networking (Nikolaidou et al., 2024). Social media or Web 2.0-based approaches involve online chat seminars, wikis, and blogs, and social networking sites make knowledge sharing easy and unassuming for the independent. This kind of instrument eases communication, divides information, and promotes online socialization (Alshaye et al., 2024). Social media has always been described as the channel through which knowledge is transmitted between communities and learners. This social media has been utilized by colleges or higher institutions to stimulate combined learning and social interconnection (Zhang et al., 2024). Furthermore, research on learning and social network sites such as Facebook has encouraged their affordances for interconnection, cooperation, knowledge, resource division, motivating engagement, and analytical thinking, as well as their benefits in terms of the appearance of specification and digital learning, especially for disadvantaged populations (Nikolaidou et al., 2024).

## 2.4 Willingness to use social media for learning

Research, such as that conducted by Yilmaz and Yilmaz (2023), has revealed that students in higher education institutions are more likely to use Facebook and other similar mechanization methods for assisting in teaching and learning than are professors, who choose conventional mechanization. These educators know that students choose to acquire knowledge and credentials through Facebook and e-mail, in contrast to conventional face-to-face interactions. Social networking sites such as Myspace and Facebook have shown, among other things, that students invest time and energy in building relationships around shared interests and knowledge communities (Lin & Sarza, 2024). This has prompted some educationalists to explore the potential of social networking to augment 'conventional' interactions and dialog between students and teachers (Li et al., 2024). In addition, some have welcomed the capacity of social networking services to offer educators a forum for 'easy networking and positive networking with students' (Murad et al., 2024).

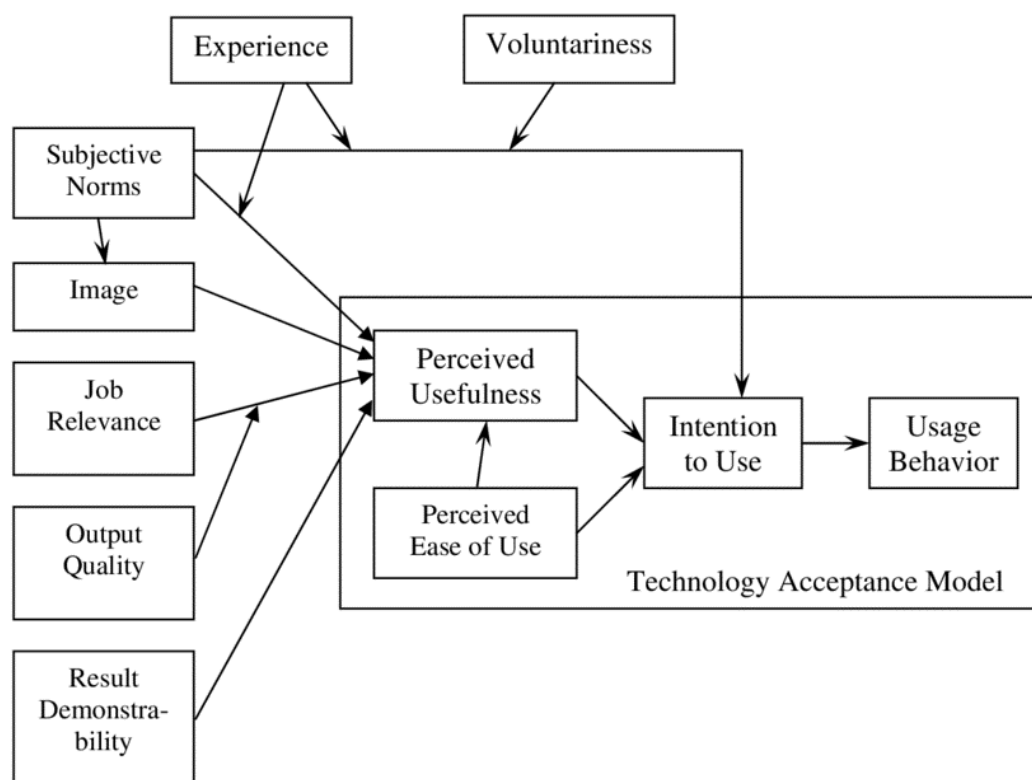
## 2.5 Factors influencing willingness to use social media platforms for learning

In the context of traditional classroom learning, lecturers who regulate the curriculum guide the course through face-to-face learning. Students assimilate the course content from the lecturers in the class and communicate with peers or instructors through discussions. In general, lecturers play reliable roles for students. As more lecturers embrace information technology to accommodate instruction, more researchers will investigate the issue of technology-integrated education. Davis (1985), who proposed the TAM (**Figure 1**), suggested that the ease of use and the usefulness of a technology influence users' ITU. Therefore, users' willingness to accept technology can be predicted on the basis of their perceptions via the TAM model (Liu et al., 2010). The extended TAM and other obtained models are used to determine students' behavior regarding the adoption of any system. In addition, finding the factors of acceptance and students' ITU social media for learning are important for boosting learning (Yalcin & Kutlu, 2019).



**Figure 1** Original TAM1.

Additionally, in recent years, there has been significant progress in terms of the professional usage of interaction technologies and the admission and prediction of the acceptance of these technologies by users (Acarli & Sağlam, 2015). One of these studies is Davis's (1989) TAM, which evolved later by Venkatesh and Davis (2000) as TAM2 (**Figure 2**). According to TAM2, individuals' intentions to use a system are influenced by two variables: first, "PU," which comes from the belief that the work performance of the individual will improve when a system is used, and second, "PEOU," which covers the belief that there is no need to try hard to learn this system (Acarli & Sağlam, 2015; Ma et al., 2025).



**Figure 2** TAM2.

## 2.6 Experience

The literature on social media acceptance confirms that experience affects both learners' PEOU and PU for social media (Mastour et al., 2025). Individuals who have more experience using computers, the internet, and email, and of saving and locating files, tend to have more favorable feelings toward the ease of use and the usefulness of a social media platform for learning (Stephen & Ritzhaupt, 2023). Another study showed that computer experience impacts learners' ITU different social media platforms and technologies for learning (Ma et al., 2025). According to Yan et al. (2024), EXP is the fifth most commonly used external factor for the TAM in the context of social media acceptance or use, and this variable was included as the external factor for the TAM in the general extended technology acceptance model for e-learning (GETAMEL) framework. Users who have previously worked with digital platforms are more comfortable utilizing new technologies, which lowers their cognitive effort and increases their self-efficacy which, in turn, improves their perceived system simplicity. Previous research has demonstrated that EXP strengthens PEOU in educational contexts (Jiang et al., 2021). By increasing feelings of competence and comfort (e.g., successful prior use of platforms, frequency of engagement, confidence in features), technological familiarity reduces anxiety and increases intrinsic enjoyment. Research has shown that experience indirectly increases enjoyment through ease of use and self-efficacy (Compeau & Higgins, 1995; Kiatrungrit & Kulsri, 2024).

## 2.7 Job relevance

Job relevance refers to the degree to which a technology is regarded as applicable and closely tied to one's duties, obligations, or academic requirements (Wohlfart & Wagner, 2025). Students are more likely to consider a social media platform beneficial when it supports assignment preparation, facilitates knowledge sharing, connects to skills they anticipate using in future professional roles, and is in line with their coursework. When students perceive social media as relevant to their coursework or future professional roles, they evaluate it as more useful for achieving learning outcomes (e.g., supporting assignments, improving skills, meeting course requirements). This relationship has been validated in TAM2 and more recent educational technology contexts (Travaglini et al., 2023; Venkatesh & Davis, 2000).

## 2.8 Perceived usefulness and perceived ease of use

The model focuses on the process of using social media for learning, where “PU” and “PEOU” are the two key factors that influence an individual’s ambition to utilize a social media platform. PU means that the user assumes that social media will enhance his/her performance, whereas PEOU refers to the credence that utilizing social media for learning will be free of effort (Yalcin & Kutlu, 2019). PEOU is also seen as the student’s perception of the amount of effort and the time needed to utilize the system (Ma et al., 2025). Moreover, if students spend much of their time learning on social media, and its usage is too difficult, they believe that the system is useless, which affects their usage rate (Alshurideh et al., 2023). Additionally, most students prefer to use user-friendly systems, and such systems are mostly successful and easily adopted (Liu, 2010).

Students develop more positive attitudes toward using social media (e.g., “helps me study better,” “saves time”) if they think it enhances their academic performance, effectiveness, and efficiency. According to recent research, positive attitudes are strongly influenced by perceived usefulness (Nilashi & Abumalloh, 2025; Park et al., 2024). In addition, students are more likely to indicate an intention to adopt and keep using social media if they believe it improves their performance (e.g., planning to use it in future courses and recommending it to peers). This positive relationship is supported by evidence from recent studies on the adoption of e-learning (Park et al., 2024).

## 2.9 Intention to use

In this study, ambition to utilize was used as the dependent variable because of its close link to actual behavior (Lin & Kim, 2016; Wohlfart & Wagner, 2025). Behavioral intention is a factor that captures how hard people are willing to perform a behavior (Ateş & Yilmaz, 2024). Using utilization ambition as a dependent variable in this study has practical benefits because access to information on the actual use of social media in schools may be too sensitive and, thus, discourages participation from schools. This study focuses on ITU technology rather than actual usage because, for example, a study conducted by Ateş and Yilmaz (2024) stated that when lecturers are asked to report their actual technology use, they may respond in a socially desirable way. This is a situation where participants respond in ways they perceive they should and what they perceive the researcher wants (Teo et al., 2024).

## 2.10 Perceived enjoyment (PE)

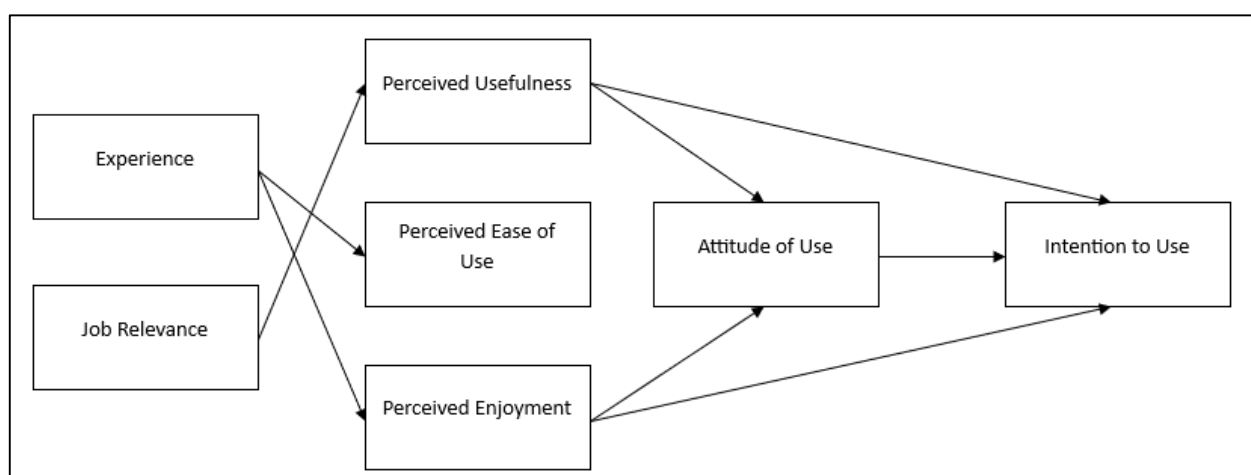
The conception of PE accords with intrinsic motivation (Mastour et al., 2025), and in the setting of information systems use, it is interpreted as “the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use” (Mastour et al., 2025). Yan et al. (2024) also identified previous studies that showed that PE significantly influences both PEOU and PU on social media for learning. According to Yan et al. (2024), eight out of eleven studies (73 %) reported a significant positive relationship between PE and PEOU on social media for learning. In terms of the relationship

between PE and PU, eight out of eight studies (100 %) showed a significant and positive link between the two constructs. If a student finds the use of a social media platform to be enjoyable, he/she is more likely to have a positive attitude toward the ease of use and usefulness of a system, and a greater ITU of the social media platform for learning (Humida et al., 2022).

## 2.11 Attitudes of use (AOU)

Attitude is defined as a person's positive or negative feelings about performing the target behavior. Awareness is associated with attitudes, and "a positive attitude toward ICT is widely recognized as a necessary condition for effective implementation" (Liu, 2010). According to Singh et al. (2024), social media success is influenced by different types of factors, including users' attitudes toward social media and their satisfaction with using technology during teaching/learning experiences. AOU social media strongly predicts students' behavioral intention to use it (e.g., "using SM is a good idea," "I plan to keep using it"). This relationship is supported by research in higher education in a variety of settings (Park et al., 2024).

On the basis of TAM2, a research model is proposed that can examine ITU social media for learning among maritime students from University Malaysia Terengganu (UMT) (see **Figure 3**). The model includes variables such as PU, PEOU, JR, intention of use, and other extended variables such as PE, attitude of use, and EXP.



**Figure 3** Proposed model.

In addition, the majority of the studies that applied the TAM literature failed to include the "external variables" component of the model, which is the anterior variable to the variables of PEOU and PU. A recent meta-analysis reported that only 60 % of the 22 articles in the sample (selected from six major journals) studied external variables, and no clear set of external variables was tested (Lin & Kim, 2016). External variables could involve a variety of factors, such as demographic and system-use experience, as well as perceived risk and necessary trust associated with system use, that could affect individual beliefs about adopting a technology system. Another meta-analysis of 88 TAM studies by previous researchers Jan et al. (2024) revealed the empirical evolution of the TAM and its integration with other theories, including theoretical constructs such as risk and trust factors (Mastour et al., 2025). On the basis of the above discussion, the following hypotheses are proposed below.

- H1: Experience positively influences perceived ease of use.
- H2: Experience positively influences perceived enjoyment.
- H3: Job relevance positively influences perceived usefulness.
- H4: Perceived usefulness positively influences attitudes toward use.

- H5: Perceived usefulness positively influences intention to use.
- H6: Perceived enjoyment positively influences attitude of use.
- H7: Perceived enjoyment positively influences intention to use.
- H8: Attitude of use positively influences intention to use.

### 3. Materials and methods

#### 3.1 Data collection

An online survey, using Google Form, was administered, because it is considered the most cost- and time-efficient method (Kurfalı et al., 2017; Mastour et al., 2025). The survey was conducted as a one-month cross-sectional study in February 2025. The data were collected via a questionnaire survey via Google Forms distributed to 200 maritime management students, comprising second- and third-year students and excluding first-year students (who had no experience with physical learning at University Malaysia Terengganu). Students specifically took part in group projects, discussion boards, and collaborative assignments where they shared resources, coordinated assignments, and shared academic information using social media sites like Facebook, YouTube, and WhatsApp. These exercises are examples of structured learning methods that closely resemble actual maritime studies coursework.

The response rate for this study was approximately 52 %. The survey took five to ten minutes to complete. Notably the 52 % response rate can be regarded as moderate, even though the survey was administered via Google Form. This response rate might have been caused by a number of factors, such as students lacking interest in taking online surveys or potential technological difficulties. Furthermore, the study included only second- and third-year students studying marine management; first-year students who had never participated in physical learning were not included. The validity of the findings was increased by this intentional sample choice, which ensured that the responses were gathered from students with pertinent learning experiences.

#### 3.1 Measures

The scale for the self-administered questionnaire was developed within the framework of the TAM (Venkatesh & Davis, 2000). The questionnaire components in the scale were graded according to five Likert scales as “strongly agree = 5,” “agree = 4,” “neutral = 3,” “disagree = 2,” and “strongly disagree = 1.” In addition to providing their demographics, participants were required to tick their preferred social media platform. Then, participants rated 34 items for seven variables (intention of use, PEOU, PU, PE, JR, EXP, and attitude of use) that constitute the main dimensions of TAM2 (Venkatesh & Davis, 2000). Most of these items have been used in previous studies on university students and schools and were found to be reliable and valid (Kurfalı et al., 2017). The details of these 34 items are shown in Appendix A. In terms of measurement, this study was planned as a cross-sectional survey that was carried out in February 2024. As a result, no evaluations were conducted before or after use. Instead, the questionnaire recorded student’s perceptions based on their combined experiences using social media tools in the aforementioned structured learning activities.

#### 3.2 Data analysis

The data of the study were analyzed via the Statistical Package for the Social Sciences (SPSS 26) to prepare the data sheet and demographic analysis for the study. To test the study hypotheses, PLS-SEM 4 was applied (Henseler et al., 2015). To perform the PLS, an algorithm involving factor loadings, composite reliability, and average extracted variance was applied, whereas the values of  $R^2$  and  $t$  statistics were calculated through bootstrapping (Podsakoff et al., 2003).

As presented in **Table 1**, the mean values for ITU = 3.88, PEOU = 3.71, PU = 3.69, PE = 3.48, JR = 3.73, EXP = 3.79, and AOU = 3.86, whereas the standard deviation values for ITU = 0.54,

PEOU = 0.52, PU = 0.57, PE = 0.85, JR = 0.68, EXP = 0.64, and AOU = 0.60. All the values were within the acceptable range, indicating that the data were normal, which is good for the recent use of social media for learning among maritime students or undergraduate students. Furthermore, the present study's measurement items were examined for common method bias (CMB). The amount of variation described by a single factor is 35.9 %, which is less than 50 %, and when measurement biases are examined via Harman's single factor (Podsakoff et al., 2003), it is determined that the data do not suffer from common method bias. CMB was not considered a serious concern.

**Table 1** Means and standard deviations.

Variable	Mean	SD
ITU	3.88	0.54
PEOU	3.71	0.52
PU	3.69	0.57
PE	3.48	0.85
JR	3.73	0.68
EXP	3.79	0.64
AOU	3.86	0.60

Convergent validity was assessed through the utilization of average variance extracted (AVE), composite reliability (CR), and item loadings. It was determined that a minimum AVE value of 0.50 is necessary to establish construct validity. According to the data presented in **Table 2**, the Cronbach's alpha values ranged from 0.791 - 0.910, whereas the composite reliability values ranged from 0.877 - 0.937. The indices obtained in this study were found to be above the suggested threshold established by Henseler et al. (2015), hence, indicating strong internal reliability of the collected data.

**Table 2** Measurement model.

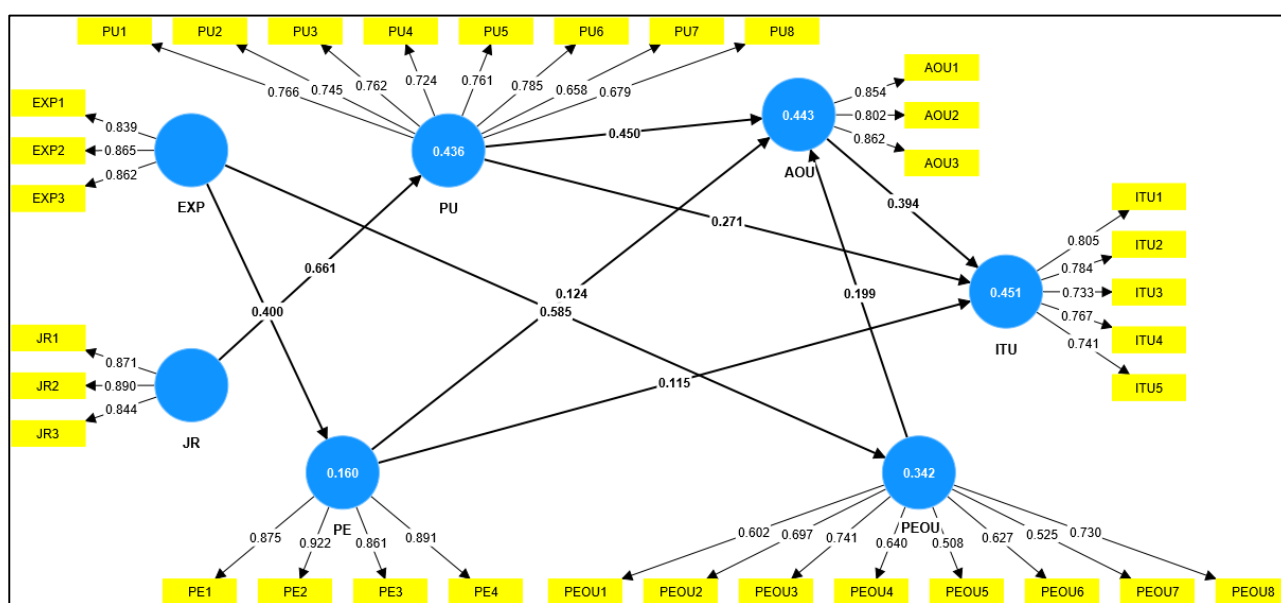
Constructs	Items	Loadings	AVE	CR	Cronbach's alpha
<b>AOU</b>	AOU1	0.854	0.706	0.878	0.791
	AOU2	0.802			
	AOU3	0.862			
<b>EXP</b>	EXP1	0.839	0.732	0.891	0.816
	EXP2	0.865			
	EXP3	0.862			
<b>ITU</b>	ITU1	0.805	0.587	0.877	0.824
	ITU2	0.784			
	ITU3	0.733			
	ITU4	0.767			
	ITU5	0.741			
<b>JR</b>	JR1	0.871	0.754	0.902	0.837
	JR2	0.89			
	JR3	0.844			
<b>PE</b>	PE1	0.875	0.788	0.937	0.910
	PE2	0.922			
	PE3	0.861			
	PE4	0.891			



**Table 2** (continued) Measurement model.

Constructs	Items	Loadings	AVE	CR	Cronbach's alpha
PEOU	PEOU1	0.602	0.521	0.845	0.806
	PEOU2	0.697			
	PEOU3	0.741			
	PEOU4	0.64			
	PEOU5	0.508			
	PEOU6	0.627			
	PEOU7	0.525			
	PEOU8	0.73			
PU	PU1	0.766	0.542	0.904	0.879
	PU2	0.745			
	PU3	0.762			
	PU4	0.724			
	PU5	0.761			
	PU6	0.785			
	PU7	0.658			
	PU8	0.679			

To assess the validity and reliability of the data for each variable, including EXP, JR, PU, PEOU, PE, attitude of use, and intention of use via Smart-PLS, an evaluation of the measurement model was conducted. Convergent validity, which included measurements of the loading factor and the AVE value, was assessed first in the evaluation of the measurement model. When the loading factor value is  $\geq 0.70$  and the AVE value is  $\geq 0.50$ , the construct might have good validity (Henseler et al., 2015). **Figure 4** shows the PLS-SEM results for the measurement model path coefficients. The default standard method for calculating path coefficients is the PLS algorithm. The loadings of individual items for the constructs ranged between 0.508 and 0.922; the factor loading is shown in **Figure 4**. Additionally, the values for average variance extracted (AVE) fell within the range of 0.521 - 0.788, which meets the recommended threshold for convergent validity.



**Figure 4** Factor loadings, path coefficients, and R-square results (PLS algorithm).

### 3.3 Discriminant validity

To measure the discriminant validity of the data, the researchers conducted a heterotrait–monotrait ratio of correlations (HTMT) test, which compared the results against a threshold criterion of less than 1 (Henseler et al., 2015). Importantly, to establish discriminant validity, the square root of the average variance extracted (AVE) of a construct must exceed the correlation it demonstrates with other constructs (Venkatesh et al., 2012). Furthermore, the entries present in the corresponding columns and rows of the correlation matrix are smaller than the diagonal elements. The findings presented in **Table 3** provide empirical evidence supporting the discriminant validity of the collected data.

**Table 3** Discriminant validity (HTMT).

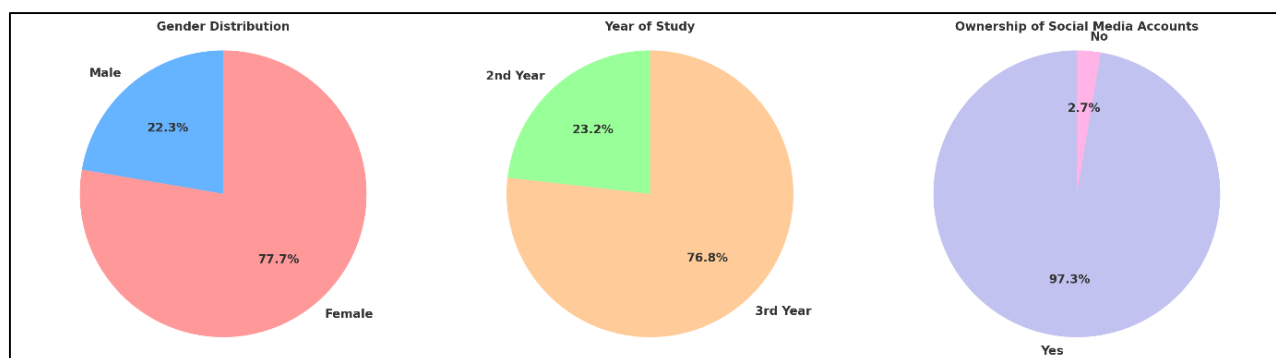
Constructs	AOU	EXP	ITU	JR	PE	PEOU	PU
AOU	1						
EXP	0.675	1					
ITU	0.758	0.574	1				
JR	0.701	0.906	0.646	1			
PE	0.509	0.459	0.491	0.53	1		
PEOU	0.549	0.65	0.712	0.547	0.341	1	
PU	0.763	0.755	0.679	0.771	0.604	0.626	1

## 4. Results and discussion

The demographic characteristics of the respondents are summarized in **Table 4** and **Figure 5**. The respondents were 77.7 % female and 22.3 % male. According to the analysis, 76.8 % of them are third-year students, whereas 23.2 % are second-year students. Finally, the majority of the respondents indicated that they own or have a social media account (98.2 %), and only a small percentage did not own or have a social media account (2.7 %). Most of the respondents had good knowledge of how to use social media on the basis of the above percentage, which is a good indicator of the potential of using social media for learning.

**Table 4** Demographic information.










Variables	Categories	Frequency N = 104	Percentage (%)
Gender	Male	23	22.3 %
	Female	81	77.7 %
Year of study			
	2	24	23.2 %
	3	80	76.8 %
Having a social media account	Yes	102	98.2 %
	No	2	2.7 %



**Figure 5** Demographic characteristics of the respondents.

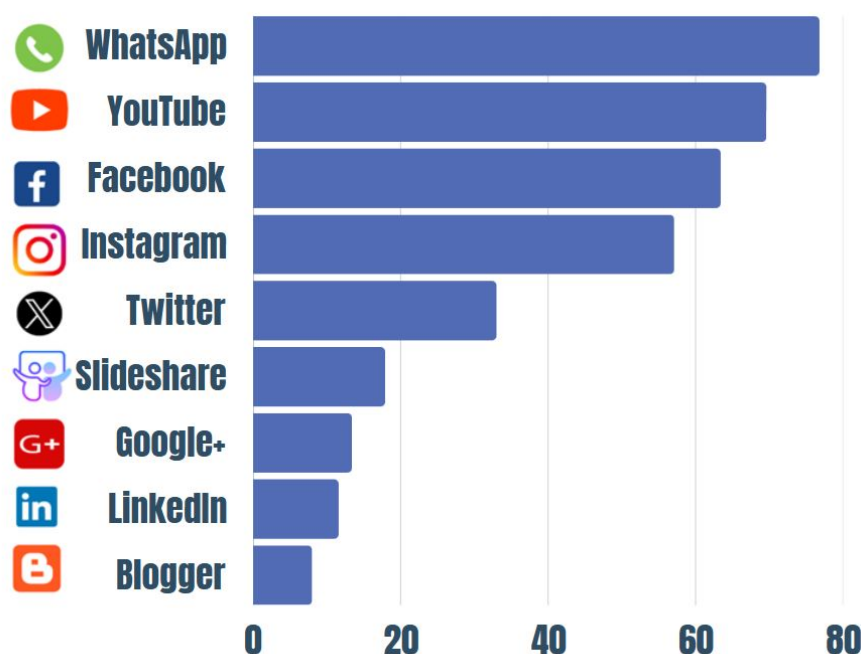
**Table 5** and **Figure 6** reveal that WhatsApp, YouTube, Facebook, and Instagram were the most preferred social media platforms, with more than 50 % of the respondents. WhatsApp had the highest number of preferences, with 86 (76.8 %). The least preferable social media platform is Blogger, which was more common in the year 2000.

**Table 5** Preferred social media platform for learning among maritime students.

Social media	Respondents	Percentage (%)
WhatsApp 	86	76.8
YouTube 	78	69.6
Facebook 	71	63.4
Instagram 	64	57.1
Twitter 	37	33
Slideshare 	20	17.9
Google+ 	15	13.4
LinkedIn 	13	11.6
Blogger 	9	8

**Table 6** presents a summary of the structural models developed to determine the relationships among various factors in the model. The theoretical model was tested by using a standardized path coefficient and t values with the help of the bootstrapping method. For H1 ( $\beta = 0.585$ ,  $t = 8.365$ ,  $p = 0.000$ ), the results indicated that EXP had a significant positive relationship with PEOU; the results of H2 ( $\beta = 0.400$ ,  $t = 4.686$ ,  $p = 0.000$ ) indicated that EXP had a significant positive relationship with PE; the results of H3 ( $\beta = 0.661$ ,  $t = 10.835$ ,  $p = 0.000$ ) indicated that JR had a significant positive relationship with job PU; the results of H4 ( $\beta = 0.450$ ,  $t = 4.213$ ,  $p = 0.000$ ) showed that perceived usefulness had a significant positive relationship with attitudes toward use; and the results of H5 ( $\beta = 0.271$ ,  $t = 1.946$ ,  $p = 0.026$ ) indicated that PU and ITU had a positive relationship. According to the

findings of this study, PE is not significantly related to attitudes toward use. H6 ( $\beta = 0.124$ ,  $t = 1.368$ ,  $p = 0.086$ ), PE is not significantly related to ITU H7 ( $\beta = 0.115$ ,  $t = 1.368$ ,  $p = 0.107$ ). Furthermore, for H8 ( $\beta = 0.394$ ,  $t = 3.338$ ,  $p = 0.000$ ), the results indicated that attitudes toward use had a significant positive relationship with ITU.



**Figure 6** Preferred social media platforms for learning among maritime students.

**Table 6** Assessment of the structural model (direct effect).

Hypotheses	$\beta$	Standard error	$t$ values	$p$ values	Conclusion
H1: EXP -> PEOU	0.585	0.070	8.365	0.000	Supported
H2: EXP -> PE	0.400	0.085	4.686	0.000	Supported
H3: JR -> PU	0.661	0.061	10.835	0.000	Supported
H4: PU -> AOU	0.450	0.107	4.213	0.000	Supported
H5: PU -> ITU	0.271	0.139	1.946	0.026	Supported
H6: PE -> AOU	0.124	0.091	1.368	0.086	Not Supported
H7: PE -> ITU	0.115	0.092	1.242	0.107	Not Supported
H8: AOU -> ITU	0.394	0.118	3.338	0.000	Supported

This research developed a theoretical model based on the TAM to determine maritime students' ITU social media for learning. The goal of this research was to examine and apply the TAM by adding new variables, namely, PE, EXP, and AOU, to the model and explore whether maritime students intend to use social media for learning. The results suggested that the proposed model is a good fit, in that it serves as an adequate representation of relationships among the factors that influence ITU social media for learning among maritime students. **Table 6** indicates that EXP has a positive and significant association with PEOU and PE ( $\beta = 0.585$ ,  $t = 8.365$ ,  $p = 0.000$ ;  $\beta = 0.400$ ,  $t = 4.686$ ,  $p = 0.000$ , respectively). The PEOU among maritime students is significantly influenced by their level of experience. This relationship is characterized by a high positive correlation, which may be attributed to several factors.

This study revealed that EXP creates a more positive belief in the ease of use of social media for learning. According to Yan et al. (2024), EXP has a positive effect on students' ITU social media for learning. The positive and significant impact of EXP is similar to that noted by previous studies (Sidik & Syafar, 2020). The factors and EXP allow students to use social media according to their experience in accessing it to increase their perception of the social media platform's usefulness.

JR significantly predicted PU, which indicates that JR can play a significant role in shaping PU ( $\beta = 0.661$ ,  $t = 10.835$ ,  $p = 0.000$ ). These results direct the positive effect of the PU, which is consistent with the findings of previous studies (Harrigan et al., 2021). Students who possess a sincere interest in and enthusiasm for maritime activities are frequently drawn to the maritime field. When the average values of the answers of the candidates are considered, one can conclude that they are eager to use social media in their professional lives (Acarli & Sağlam, 2015).

In addition, PU has a significant and positive relationship with attitudes of use and the ITU ( $\beta = 0.450$ ,  $t = 4.213$ ,  $p = 0.000$ ;  $\beta = 0.271$ ,  $t = 1.946$ ,  $p = 0.026$ , respectively) and confirms the findings of a previous study (Jan et al., 2024). The TAM can be used to understand the strong and positive relationships among PUs, attitudes toward use, and the ITU among maritime students. Students who consider technology to be beneficial to their education have a positive attitude toward using it, which increases their desire to include it in their studies. This is in line with a study conducted on nursing students' behavioral ITU software in their learning (Stephen & Ritzhaupt, 2023). Therefore, the PEOU and PU of social media are considered the key factors in assessing students' and teachers' behavioral willingness to accept and use social media for learning in Malaysian higher education (Badr et al., 2024).

PE was not significantly associated with attitudes toward use ( $\beta = 0.124$ ,  $t = 1.368$ ,  $p = 0.086$ ). H6 is consistent with the prior findings of Özdemir (2024) that maritime students might have the perception that social media has less relevance to their academic and professional objectives than alternative tools or technologies do. This study's lack of relevance for PE offers the possibility that, despite social media's widespread use, students' intention to utilize it for learning may not be as dependent on its ability to promote fun. This research emphasizes how crucial it is to prioritize social media's educational and practical benefits over its entertaining potential. Teachers and educational institutions should emphasize social media's useful applications and compatibility with academic goals in addition to its entertainment value and engagement potential. Instead of concentrating on producing amusing or pleasurable experiences, investigating how social media might be incorporated into learning environments to improve the educational experience could be helpful.

Additionally, for H7, this research revealed no significant relationship between PE and ITU H7 ( $\beta = 0.115$ ,  $t = 1.368$ ,  $p = 0.107$ ) and confirmed the findings of previous studies (Mastour et al., 2025). Venkatesh and Davis (2000) described PE as "the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use."

For H8, AOU has a significant and positive correlation with the ITU ( $\beta = 0.394$ ,  $t = 3.338$ ,  $p = 0.000$ ). These findings are consistent with the relationship postulated in the TAM (Teo, 2011). The findings of this study demonstrate that AOU plays a significant role in persuading maritime students' ITU social media for learning. The majority of studies have shown that attitude is a vital component that can lead to the use of social media for learning (Muda & Hamzah, 2021; Shahzalal et al., 2023).

## 6. Conclusions

This study presented the most preferred social media platform for learning, according to maritime management students. WhatsApp is the most preferred social media platform for learning, followed by Facebook and YouTube. The findings explained the factors that influence ITU social media for learning among maritime students according to the extended TAM, which are PU, PEOU, JR, and ITU, whereas the other three factors consist of external variables, which are PE, EXP, and attitudes toward use. Additionally, attitudes toward use (AOU) are actually influenced by PU, PEOU,

and PE factors, where students who are eager and responsible for their learning want to use social media tools to be easy to use and access, social media to be mostly user friendly, and sufficient information on certain subjects to be provided and be useful for group study or socializing with other friends.

### 6.1 Implications for education

For practical implications, the instruments developed in this study may be valuable tools for implementing social media tools as learning methods during a pandemic. This study also provides important information on the preferred social media platform for learning from the respondents. This can serve as a guideline to ensure that teaching and learning can be conducted by considering student preferences. Owing to university closures, students' acceptance and use of online learning are certainly more unavoidable than they are under normal conditions. Thus, social media can serve as a potential tool to make online classrooms more engaging. In addition, this study can provide insight into providing alternatives for online distance learning by introducing social media as a learning tool.

### 6.2 Limitations and future directions

Despite the availability of statistical support, this research has several limitations. Therefore, more respondents with different major backgrounds are needed for future studies. This study included only second- and third-year maritime students from University Malaysia Terengganu. Although the purpose of this sample was to include respondents who had relevant physical learning experiences, the limited context makes it difficult to extrapolate the results to other academic fields or larger student groups. There may be significant differences in the viewpoints of first-year, graduate, and other students attending various institutions in Malaysia and abroad.

Social media platforms were determined to be potential learning platforms when no physical lectures were allowed due to social distancing. This might influence the outcome of the study. By conducting this study, the trends in student preferences as social media platforms are understood to be continuously changing, where new platforms will be introduced, and some platforms are made redundant owing to a lack of some components that are desired by students in integrating their learning experiences.

### CRediT author statement

**Al Montaser Mohammad:** Conceptualization; Methodology; Software. **Nurul Amirah Fitrah Binti Sohaimi:** Data curation; Writing - Original draft preparation. **Masha Nur Salsabiela Menhat:** Supervision; Visualization; Writing - Reviewing and Editing; Funding acquisition; Investigation. **Effi Helmy Ariffin:** Project administration; Software; Validation.

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## Appendix A

### Measurement items used in this study

Item	Statement
<b>Intention to Use (ITU)</b>	
ITU 1	1. I am planning to use social media in my learning activities in the future
ITU 2	2. During my life as a student, I am thinking of using social media for learning activities
ITU 3	3. I will be willing to give the required time and energy for my learning activities by using social media platforms
ITU 4	4. I expect that I would use social media for learning in the future
ITU 5	5. I intend to continue to use social media for learning in the future
<b>Perceived Ease of Use (PEOU)</b>	
PEOU 1	1. For me, social media is suitable to carry out learning activities
PEOU 2	2. It will be beneficial for me to become skillful at using social media platforms for learning
PEOU 3	3. Internet availability and signal strength will be a problem in accessing social media platform for learning
PEOU 4	4. The usage of social media takes more of my time than necessary with its gadget manipulation. It is easy but time consuming
PEOU 5	5. Devices involved in using social media for research are frustrating
PEOU 6	6. Internet data bundles affordability will be a problem in accessing the social media for learning
PEOU 7	7. Using social media for learning is effortless for me
PEOU 8	8. I will use social media, gadgets for learning without written instruction
<b>Perceived Usefulness (PU)</b>	
PU 1	1. Using social media will improve my performance in learning as a student
PU 2	2. Using social media will improve my productivity in my learning process
PU 3	3. Using social media will improve my efficiency in my learning process
PU 4	4. I think that using social media in my learning activities will be beneficial for me in terms of my performance in my grade
PU 5	5. Social media usage gives me control over my learning for every subject
PU 6	6. Social media make me finish the content of my learning quickly for every subject
PU 7	7. Social media will support the critical part of my learning task for every subject
PU 8	8. The use of social media in learning makes my study more diverse, especially for the maritime subject
<b>Perceived Enjoyment (PE)</b>	
PE 1	1. It is easy for me to carry out learning activities on social media
PE 2	2. I can do the things I want, in terms of learning activities, on social media for the maritime subject especially
PE 3	3. Social media usage reduces stress and tension inherent in learning for every subject.
PE 4	4. Social media usage reduces boredom in learning for every subject

Item	Statement
<b>Job Relevance (JR)</b>	
<b>JR 1</b>	1. Using social media for learning is important for my future grade
<b>JR 2</b>	2. Using social media for learning is related to my future career in the maritime sector
<b>JR 3</b>	3. Using social media for learning serves the purpose of my future career in the maritime sector
<b>Experience (EXP)</b>	
<b>EXP 1</b>	1. I enjoy using computers or any devices for learning through social media
<b>EXP 2</b>	2. I am comfortable using social media for learning
<b>EXP 3</b>	3. I am comfortable saving and locating files through social media for my learning activities
<b>Attitudes of Use (AOU)</b>	
<b>AOU 1</b>	1. Once I start using social media for learning, I find it hard to stop
<b>AOU 2</b>	2. I look forward to those aspects of my subjects that require the use of social media
<b>AOU 3</b>	3. I like to do learning with social media