INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 16, Issue 3, (2026) E-ISSN: 2222-6990

Attitudes of Educators towards Artificial Intelligence Adoption in in Malaysian Maritime Education Institutions

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DOI Link: http://dx.doi.org/10.6007/IJARBSS/v16-i3/27957

Published Date: 17 March 2026

Abstract

Purpose: This study investigates the relationship between Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) toward educators' attitude towards Artificial Intelligence (AI) in education, based on the Technology Acceptance Model (TAM). **Design/methodology/approach:** This study used a quantitative approach with a structured questionnaire given to academicians at Akademi Laut Malaysia, resulting in 29 valid responses. The questionnaire included sections on Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward AI Adoption (ATT), and Demographic Profile, measured on a five-point Likert scale. Data were analyzed using Partial Least Squares–Structural Equation Modelling (PLS-SEM) in SmartPLS 4.0 to test the reliability of the constructs and the relationships between variables, offering insights into how educators' views on usefulness and ease of use affect their attitudes toward adopting AI in education. **Findings:** This study applied the Technology Acceptance Model (TAM) to explore factors influencing maritime educators' attitudes toward adopting Artificial Intelligence (AI) in education at Akademi Laut Malaysia. The findings show that Perceived Usefulness (PU) strongly affects educators' attitudes, meaning they are more likely to accept AI when they see clear benefits to teaching and learning. However, Perceived Ease of Use (PEOU) did not have a significant effect, suggesting that how easy AI is to use is less important in this context. Overall, the results confirm that TAM is a useful model for understanding AI adoption in Maritime Education and Training (MET). **Research limitations/implications:** This study is limited by its narrow model scope, focusing only on the core TAM constructs; Perceived Usefulness and Perceived Ease of Use without including contextual factors such as trust, perceived risk, or organizational support that may better explain AI adoption in maritime education settings. **Practical implications:** This study does not include real-world factors such as trust, perceived risk, and organizational support, limiting its practical relevance for policymakers and institutions

implementing AI in maritime education. **Originality/value:** This study contributes original insights by applying the Technology Acceptance Model (TAM) within the context of maritime education, a specialized and safety-critical field where research on AI adoption remains limited. It provides empirical evidence on how maritime educators perceive the usefulness and ease of use of AI, offering valuable understanding of the factors that influence technology acceptance in Maritime Education and Training (MET). The findings can guide policymakers and institutions in designing targeted strategies, training programs, and policies to support effective AI integration in maritime teaching and learning environments.
Keywords: Artificial Intelligence, Education, Maritime, Technology

Introduction

Artificial intelligence (AI) is acknowledged as a principal catalyst of technological transformation in the Fourth Industrial Revolution (4IR). Recently, substantial advancements in AI have occurred, with Generative Artificial Intelligence (GAI) becoming a prominent and widely debated subject. Generative AI denotes artificial intelligence systems that create content, including text, audio, or video, with the objective of producing original, distinctive, and innovative material based on the data utilized for training (Mannuru et.al, 2023).

The integration of AI in educational systems is transforming the methods by which students learn, educators teach, and institutions operate. AI is transforming the educational landscape by customizing learning experiences, automating administrative tasks, and providing real-time feedback, thereby bridging gaps and fostering a more inclusive and effective learning environment (Kamalov, Santandreu Calonge & Gurrib (2023).

Even though artificial intelligence in education (AIED) is gaining momentum, educators' impressions of it are inconsistent and frequently not well informed. Many instructors perceive the potential advantages of AIED, but they are uncertain about how it will affect classroom pedagogy, how their roles will alter, how transparent artificial intelligence judgments are, and how it will be integrated into their classrooms. A significant number of people express ambivalent or unsure opinions, and they have a limited amount of training and resources, which limits meaningful adoption and increases the disparity between the actual practice of AIED and the potential it holds. Although there is guidance at the system level, evidence indicates that instructors still require targeted professional development and clearer guardrails to transfer their positive interest into competent, ethical usage (Cruz, Duque & Carvalho (2024).

Research in Malaysia and the broader region indicates that both graduate and currently employed educators generally hold favorable views of AI; yet, significant uncertainties and skill deficiencies hinder their confident use in the classroom, particularly for subject-specific uses and ethical considerations. The lack of uniform training, local models, and policy-congruent implementation guidance jeopardizes consistent adoption throughout schools and programs, highlighting the necessity for tailored professional development and evidence-based frameworks for AI-enhanced instruction (Chang, Jau & Bujeng (2024).

In higher education, faculty interest in generative AI (e.g., ChatGPT) is substantial but inconsistent: perceived usefulness significantly influences attitudes and intentions to adopt, while concerns regarding academic integrity, assessment design, and social influences hinder

uniform and responsible implementation across departments. Empirical research indicates a deficiency in persistent data and professional learning frameworks that facilitate academics in transitioning from tentative experimentation to pedagogically coherent, assessment-secure integration on a large scale (Mamo, Crompton, Burke, & Nickel (2024).

AI integration at Akademi Laut Malaysia is still emerging, and many educators have limited exposure or structured experience with AI tools. Measuring behavioural intention may therefore not reflect true predictive behaviour because actual AI use is still minimal. Attitude was examined first to understand foundational acceptance readiness before moving toward behavioural prediction. Hence, this research aims to identify the relationship between perceived usefulness and perceived ease of use towards perception of educators on artificial intelligence in education.

Literature Review

The literature review on empirical evidence across different technological, organizational, and educational domains, including applications within the maritime sector, has consistently confirmed the robustness of the Technology Acceptance Model (TAM). In particular, the model's core constructs, Perceived Ease of Use (PEU) and Perceived Usefulness (PU), have been shown to form stable direct and indirect predictive capacities in explaining users' behavioural intentions to adopt innovative technologies or systems. Reviewed cross-sectional meta-analyses, systematic reviews, and context-specific studies involving virtual reality and simulation consistently identified PU as the dominant predictor of behavioral intention (BI). Conversely, the direct relationship between PEU and BI tends to be modest, with PEU primarily exerting its influence indirectly through PU (Venkatesh & Davis, 2000; Naseri, R. N. N., Azis, S. N., & Abas, N. (2025).

TAM and AI Adoption in Education.

The Technology Acceptance Model (TAM) remains a widely used theoretical lens to examine how people come to accept and use new technologies (Branko, 2025). In TAM, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are antecedents of a user's Attitude (ATT) toward using the technology, which in turn influences behavioural intention or actual adoption (Jin et al., 2025). In educational research, scholars have applied TAM models to understand teachers' and students' acceptance of learning technologies, digital systems, and more recently, artificial intelligence (AI) tools. Tools like OpenAI's Generative Pre-Trained Transformer (GPT) have made remarkable strides across various disciplines, with education emerging as a particularly fertile ground for innovation (Fauzi et. Al, 2023). Active learning, as a pedagogical approach, places the learner at the center of the training or educational process, highlighting elements such as interaction, customisation, engagement, and the application of previously acquired knowledge (Grasmeier et. Al, 2025).

Perceived Usefulness (PU)

Perceived Usefulness refers to the degree to which a user believes that employing technology will improve their performance or outcomes (Davis et al., 1989). There are studied has found that 3,848 teachers in Estonia and found that perceived usefulness significantly predicted teachers' readiness to adopt AI tools, and stronger PU correlated with higher adoption intentions (Granström and Oppi, 2025). In a general educational AI adoption study, the study observed that PU had a robust effect on both users' attitudes toward AI and their intention

to use it. Through robust statistical techniques, the study provided a comprehensive understanding of the factors influencing teachers' acceptance and use of technology, highlighting the role of perceived usefulness and ease of use (Ghimire, A., & Edwards, J. (2024).

Perceived Ease of Use (PEOU)

Perceived ease of use denotes the degree to which a user believes that interacting with technology will be free of effort (Davis et al., 1989). Perceived ease of use was proven to be significant predictors to understand factors affecting teachers' acceptance of technology for online teaching, finding cognitive attitudes (Khong et al, 2022). The maritime domain offers an instructive parallel. This proclamation was founded in the case of a VR engine room simulator, applied TAM to maritime engineering students and found that PEOU influenced PU, which then influenced behavioural intention to adopt the simulator. These findings indicate that PEOU is meaningful in shaping both direct attitudes and indirect perceptions of usefulness (Bačnar et al.,2025).

Attitude towards AI Adoption (ATT)

Attitude toward use (ATT) in the TAM reflects a user's judgment about adopting technology. In Maritime Education and Training (MET), ATT is shaped by concerns like safety, regulatory compliance, simulation fidelity, and trust in AI systems. A maritime Industry report 2025 found that while 82% of maritime professionals are optimistic about AI, nearly two-thirds worry it could erode human judgment. Similarly, maritime students have raised concerns about liability and accountability in autonomous systems (Learner Viewpoint, 2024). These factors highlight the importance of trust and reliability in shaping attitudes toward AI in MET.

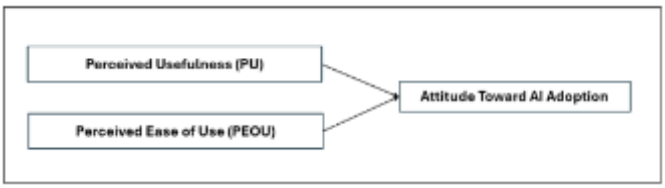

Figure 1. Adopted from Davis et al., 1989.

Hypothesis Development

Educators who perceive AI as beneficial in enhancing maritime teaching and learning outcomes such as improving simulation accuracy, predictive maintenance modules, or autonomous navigation exercises are more likely to hold positive attitudes toward its use in MET. Previous studies confirm that perceived usefulness strongly influences users' positive evaluations of educational technologies (Granić & Marangunić, 2019; Sánchez-Prieto et al., 2019, Dahri et al., 2024).

H1: *Perceived usefulness positively influences educators' attitudes toward AI use in maritime education.*

When educators find AI applications easy to learn, configure, and operate such as intuitive simulation interfaces, efficient data integration, and low maintenance they are more likely to develop favourable attitudes toward their use in teaching. Ease of use has been widely shown

to influence acceptance, particularly in specialized technical education environments (Ghimire, A., & Edwards, J.,2024).

H2: *Perceived ease of use positively influences educators' attitudes toward AI use in maritime education.*

Methods

This study aims to identify the relationship between perceived usefulness and perceived ease of use towards perception of educators on artificial intelligence in education. A quantitative technique was employed in this study by distributing questionnaires to academicians in Maritime Institutions. The questionnaire is divided into 5 sections, Section A contains the Perceived Usefulness (PU), Section B contains constructions of Perceived Ease of Use (PEOU), Section C contains Attitude Towards AI Adoption (ATT) and Section D contains Demographic Profile.

The respondents of this research are academicians from Maritime Institutions which there are 29 usable respondents for this study. The total population for this study consists of non-technical academicians who have experience using AI in teaching and learning, with a total population of approximately 30 individuals. According to the widely referenced sample size determination table by Krejcie and Morgan (1970), a population size of 30 requires a minimum sample size of 28 respondents to achieve an acceptable confidence level and margin of error for generalisation. In this study, 29 valid responses were obtained, which not only meets but exceeds the recommended threshold. Therefore, the sample size is considered adequate, statistically defensible, and representative of the target population. Furthermore, because the purpose of this research is focused specifically on a niche subset (i.e. non-technical academicians who actively utilise AI), the small population size is justified and reflective of real field conditions rather than sampling limitation.

Respondents were asked to indicate their degree of agreement with each item for each construction in a five-point Likert scale (5= Strongly Agree, 4 =Agree, 3 = Neutral, 2 = Disagree, 1= Strongly Disagree).TAM model indicates that for a technology to be accepted, two factors influence upon, it one is how easy people believed it is to be used or in other words user friendly features, and also how useful one finds the technology to be (Davis,1989). These two attributes will predict the users' attitude towards using the technology (either positive or negative) which will influence their behavioural intention to use and the actual usage itself (Davis, 1989). Additionally, the Partial Least Square Structural Equation Modelling (PLS-SEM) estimate approach has been carried out with the assistance of the SmartPLS application (version 4.0) to carry out the analysis of the research model that has been constructed which measurement for model evaluation on reliability and structural model evaluation for hypotheses relationship testing.

Findings

Demographic Profile of Respondents

The demographic analysis in Table 1 shows that most participants were between the ages of 41 to 50 years old, with a total of 11 individuals, followed closely by those aged 51 to 60 years old with 10 respondents. Meanwhile, only a small portion were younger, with 6 individuals aged 31 to 40 years old and 2 individuals aged 20 to 30 years old. In terms of gender distribution, the sample is almost equal with 15 females and 14 males. Regarding marital

status, 21 respondents are married while 8 are single, indicating that the majority come from a more settled personal background. Overall, the demographic profile reflects a mature and experienced group of educators with balanced gender representation and a high proportion of married participants, which may influence their perspectives toward AI adoption in maritime education.

Table 1
Demographic Profile

Demographic Profile	
Age Group	**Total**
20-30 years old	2
31-40 years old	6
41-50 years old	11
51-60 years old	10
	29
Gender	**Total**
Female	15
Male	14
	29
Status	**Total**
Married	21
Single	8
	29

Measurement Model Assessment
The measurement model assessment was conducted to ensure the reliability and validity of the latent constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward AI Adoption (ATT). All constructions demonstrate satisfactory internal consistency, with Cronbach's Alpha and Composite Reliability (CR) values exceeding the recommended threshold of 0.7, indicating reliability of the instrument. Convergent validity was achieved as Average Variance Extracted (AVE) values were above 0.5, confirming that each construct explained more than half of the variance of its indicators. Discriminate validity was also verified using the Heterotrait-monotrait Matrix, establishing that each construct was empirically distinct.

Table 2
Reliability and Validity

Variable	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Attitude	0.812	0.826	0.875	0.638
PEOU	0.890	0.903	0.924	0.753
Perceived Usefulness	0.807	0.827	0.872	0.631

Refer to Table 2, all constructs demonstrated strong internal consistency which referring to Figure 1. The Cronbach's Alpha values (ranging from 0.807 to 0.89) and Composite Reliability (rho_a) values (ranging from 0.872 to 0.924) exceeded the recommended threshold of 0.7, confirming the reliability of the instrument.

Convergent Validity: Convergent validity was achieved as the Average Variance Extracted (AVE) values were all above 0.5 (ranging from 0.631 to 0.753), confirming that each construct accounted for more than half of the variance of its respective indicators.

Discriminant Validity: Discriminant validity was also verified using the Heterotrait-monotrait (HTMT)-matrix (Table 3), establishing that each construct was empirically distinct from the others.

Table 3
Discriminant validity - HTMT

	ATT	PEOU
ATT		
PEOU	0.683	
PU	0.783	0.778

Structural Model Evaluation and Hypothesis Testing.
The structural model was evaluated to test the hypothesized relationships (H1 and H2) between the exogenous constructs (PU and PEOU) and the endogenous construct (ATT). The results of the hypothesis testing are presented in Table 4 and visualized in Figure 1.

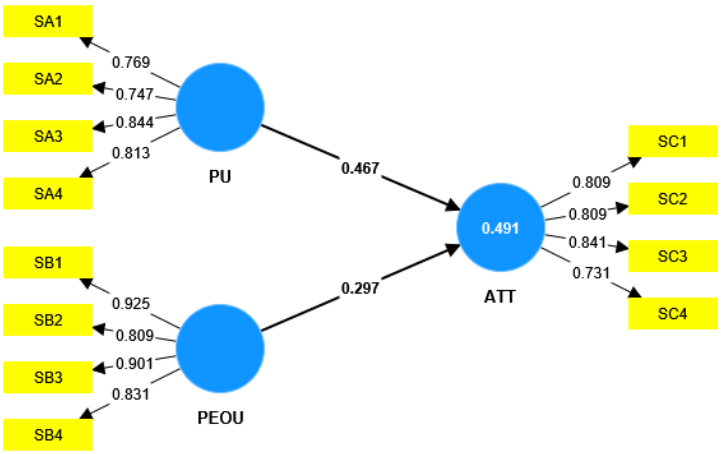

Figure 1: Path Analysis

Table 4
Hypothesis Result

Hypotheses	Path coefficients	*t* Value	*p* value	$f2$	(95%) Lower Limit and Upper Limit	Decision
PEOU -> ATT	0.297	1.611	0.107	0.051	[0.028, 0.684]	Not support
PU -> ATT	0.467	2.664	0.008*	0.500	[0.103, 0.787]	Support

* significant at $p < 0.05$

The analysis in Table 4 reveals that path coefficient from PU to ATT was positive and statistically significant (β=0.467, p=0.008). The effect size is large where f^2 = 0.500 confirms that as educators perceive AI to be more useful for enhancing their teaching performance and student outcomes. However, the relationship between PEOU and ATT (β=0.297) was positively not significant, with a p = 0.107. The 95% confidence interval (0.028 to 0.684) crosses the non-significant range, and the effect size (f^2 = 0.051) reflects a small and negligible practical impact.

In summary, the structural model evaluation reveals that Perceived Usefulness is a significant and potent predictor of educators' attitudes toward AI adoption, while the direct influence of Perceived Ease of Use on attitude is not empirically supported in this context. Additionally, the model explained a substantial amount of variance in the endogenous constructs, specifically 49.1% of the variance in Attitude.

Discussion and Conclusion

This study successfully applied the Technology Acceptance Model (TAM) to investigate the factors influencing maritime educators' attitudes toward the adoption of Artificial Intelligence (AI) in education, specifically at Akademi Laut Malaysia. The empirical findings, derived from the Partial Least Square—Structural Equation Modelling (PLS-SEM) analysis, affirm the theoretical salience of Perceived Usefulness (PU) as a primary determinant of technology acceptance in specialized educational contexts.

The measurement model demonstrated robust psychometric properties, confirming the reliability and validity of the constructs. The structural model yielded two key conclusions. Firstly, Perceived Usefulness (PU) is a significant and strong positive predictor of Attitude Toward AI Adoption (ATT) (β=0.467, p=0.008). This finding is consistent with established literature, which often identifies PU as the dominant factor in technology adoption. It underscores that for AI to be accepted in Maritime Education and Training (MET), educators must clearly perceive its ability to enhance simulation accuracy, streamline predictive maintenance modules, or otherwise improve teaching and learning outcomes

Secondly, conclusion Perceived Ease of Use (PEOU) was not found to be a statistically significant direct predictor of ATT (β=0.297, p=0.107). This result suggests that while an intuitive interface is beneficial, the effortlessness of using AI is not, by itself, the critical driver of positive attitudes among these specialized educators. Their acceptance is primarily utility-driven, prioritizing functional benefits over mere simplicity. This pattern aligns with findings in other complex technological domains where PU is often prioritized over PEOU.

Collectively, PU and PEOU explained a substantial 49.1% of the variance in educators' attitudes toward AI adoption (R2 = 0.491). This high explanatory power validates the applicability of the core TAM constructs in predicting AI acceptance within the highly technical and regulated environment of maritime education.

Theoretical Implications

The current work sets a baseline to understand perceived usefulness and ease of use as predictors of attitude. The next logical step is to extend the model into full TAM, including Behavioural Intention and possibly Actual Use, when AI adoption becomes more prevalent.

Thus, this study intentionally isolates the attitude dimension as a precursor for longitudinal research or future phase extension.

Practical and Social Implications

The broad scope of disciplines involved in this study has required considerable support from colleagues and reviewers throughout the research and publication process. I am deeply grateful to many individuals for their thoughtful, thorough, and timely feedback, which greatly enhanced the quality of this work. I hope that this note conveys my sincere appreciation for their assistance. Their generosity has made the preparation of this paper far less demanding. In addition, the findings highlight areas for further research to deepen the understanding of AI adoption in specialized educational fields. Future studies should consider expanding the model to include constructs relevant to the maritime context, such as Trust in AI Systems, Perceived Risk related to safety and regulatory compliance, and Organizational Support or Training Quality.

Limitations and Suggestions for Future Research

The results of this study suggest improvement for future research to further advance the understanding of AI adoption in specialized educational fields. Future research should expand the model by integrating constructions relevant to the maritime environment, such as trust in AI systems, perceived risk (e.g., safety and regulatory compliance), or organizational support/training quality. The inclusion of these external factors, particularly those related to safety and accountability, could enhance explanatory power and provide more actionable insights for policy makers.

Acknowledgement

The author would like to express sincere appreciation to Akademi Laut Malaysia (ALAM) for the support and permission granted to publish this paper. The encouragement and institutional support provided by ALAM are gratefully acknowledged and have contributed significantly to the successful completion and dissemination of this research.

References

Andic, B. (2025). Artificial Intelligence and Deepfake Learning in Higher Education. Journal of Baltic Science Education.

Bačnar, D., Barić, D., & Ogrizović, D. (2025). Charting the Future of Maritime Education and Training: A Technology-Acceptance-Model-Based Pilot Study on Students' Behavioural Intention to Use a Fully Immersive VR Engine Room Simulator. Applied system innovation, 8(3), 84.

Chang, A., Jau, A., & Bujeng, B. (2024). Exploring Perception of Trainee Teachers at the Malaysian Institute of Teacher Education towards Chatbot-Based Artificial Intelligence: ChatGPT. Progress in Computers and Learning, 1(1), 36-46.

Cruz, S., Duque, D., & Carvalho, V. (2024). STEAM Teachers' Perceptions of Artificial Intelligence in Education: Preliminary Research. In CSEDU (2) (pp. 278-285).

Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Aldraiweesh, A., Alturki, U., Almutairy, S., Shutaleva, A., & Soomro, R. B. (2024). Extended TAM based acceptance of AI-Powered ChatGPT for supporting metacognitive self-regulated learning in education: A mixed-methods study. Heliyon, 10(8), e29317. https://doi.org/10.1016/j.heliyon.2024.e29317

Fauzi, F., Tuhuteru, L., Sampe, F., Ausat, A. M. A., and Hatta, H. R. (2023). Analysing the role of ChatGPT in improving student productivity in higher education. J. Educ. 5, 14886–14891. doi: 10.31004/joe.v5i4.2563

Ghimire, A., & Edwards, J. (2024). Generative AI adoption in classroom in context of technology acceptance model (TAM) and the innovation diffusion theory (IDT). arXiv preprint arXiv:2406.15360.

Grasmeier, M.; Tadić, T. Enhancing Maritime Safety Training Through Active Learning: The Theoretical Framework and Prototype Development of the Virtual Training Vessel. 2023. Available online: https://www.researchgate.net/publication/376167960_Enhancing_Maritime_Safety_Training_Through_Active_Learning_The_Theoretical_Framework_and_Prototype_Development_of_the_Virtual_Training_Vessel (accessed on 18 April 2025).

Jin, Y., Yan, L., Echeverría, V., Gašević, D., & Maldonado, R.M. (2024). Generative AI in Higher Education: A Global Perspective of Institutional Adoption Policies and Guidelines. Comput. Educ. Artif. Intell., 8, 100348.

Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. Sustainability, 15(16), 12451.

Khong, Hang & Celik, Ismail & Le, Tinh & Lai, Thi & Nguyen, Andy & Bui, Hong. (2022). Examining teachers' behavioural intention for online teaching after COVID-19 pandemic: A large-scale survey. Education and Information Technologies.

Mamo, Y., Crompton, H., Burke, D., & Nickel, C. (2024). Higher education faculty perceptions of ChatGPT and the influencing factors: A sentiment analysis of X. TechTrends, 68(3), 520-534.

Mannuru, N. R., Shahriar, S., Teel, Z. A., Wang, T., Lund, B. D., Tijani, S., ... & Vaidya, P. (2025). Artificial intelligence in developing countries: The impact of generative artificial intelligence (AI) technologies for development. Information development, 41(3), 1036-1054.

Naseri, R. N. N., Azis, S. N., & Abas, N. (2025). A review of technology acceptance and adoption models in consumer study. FIRM Journal of Management Studies, 8(2), 188-199. Study: Maritime Industry is Trying Out AI But is Still Skeptical. (2025, August 28). The Maritime Executive. https://maritime-executive.com/article/study-maritime-industry-is-trying-out-ai-but-is-still-skeptical?utm_source

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS quarterly, 425-478.