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Factors influencing online learning motivation of students at Can Tho University

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ABSTRACT

This study explores the factors influencing students' motivation for online learning at Can Tho University. The research examines five key factors: personal, lecturer-related, institutional, academic, and environmental aspects. A survey was conducted with 892 students across various academic disciplines. The study employed statistical analyses, including Cronbach's Alpha reliability testing, exploratory factor analysis (EFA), and multiple regression analysis to determine the impact of these factors on students' motivation. The findings indicate that personal and lecturer-related factors have the most significant positive influence, highlighting the importance of self-discipline, time management, and lecturer support. Institutional factors also play a crucial role, particularly in terms of learning infrastructure and support services. However, environmental factors negatively affect motivation, such as poor internet connectivity, financial difficulties, and distractions, which hinder students' engagement. Additionally, students with higher academic performance and greater online learning experience show stronger motivation. Differences across academic disciplines suggest the need for tailored teaching methods and institutional support. These findings provide insights into enhancing online learning motivation and contribute to policy recommendations improving the quality of online education at Can Tho University.

1. INTRODUCTION

In modern education, online learning is becoming increasingly popular and is considered an effective way to deliver knowledge and skills to students. The rapid advancement of information and communication technology has created numerous opportunities for implementing new learning methods, enabling students to access diverse learning resources more flexibly. However, student motivation for online learning remains a significant challenge, directly affecting their academic performance. Many students perceive online learning as having a negative impact on their motivation due to limited social interaction, mismatches between expectations and course content, as well as organisational and learning environment issues (Meşe & Sevilen, 2021).

Existing research indicates that learning motivation is not only dependent on individual factors such as self-discipline and time management skills but is also influenced by instructors, institutional infrastructure, academic content, and the overall learning environment (Garrison, 2008; Berestova et al., 2022; Hamidah, 2022). To enhance student motivation and engagement in online learning environments, it is essential to design well-structured courses, foster social interactions, and ensure instructor presence (Gedera et al., 2015).

Although many studies have explored factors affecting online learning motivation, no research has specifically examined their impact on students at Can Tho University.

The objective of this study is to develop a research model to identify the factors influencing students' online learning motivation at Can Tho University. Specifically, the study seeks to address the following research questions:

1. What factors influence the online learning motivation of students at Can Tho University?

2. To what extent do these factors impact students' motivation for online learning?

The findings of this study will not only clarify the factors that facilitate and hinder students' learning motivation but also provide a foundation for developing policies and solutions to improve the quality of online learning at Can Tho University.

2. REVIEW OF LITERATURE

Motivation for online learning is a critical determinant of students' academic success. Numerous studies have identified various factors influencing this motivation, which can be categorized into five main groups: personal factors, instructor-related factors, institutional factors, academic factors, and environmental factors.

Personal factors encompass attributes such as self-discipline, time management, and technological proficiency. Students with strong self-regulated learning habits tend to exhibit higher motivation in online learning environments (Zimmerman, 2012). Additionally, self-confidence and personal interest have been recognized as key factors in enhancing learning motivation (Schunk, 2003). Furthermore, goal orientation plays a crucial role in self-regulation and motivation enhancement (Gaeta et al., 2012), as students' learning goals significantly influence their approach to online learning (Tang et al., 2023).

Instructor-related factors play a vital role in fostering student motivation. Suggests that instructor support and constructive feedback can enhance student motivation and engagement in online courses (Garrison, 2008). Similarly, Chickering and Gamson (1987) highlighted essential principles of effective teaching, emphasizing the importance of interaction and feedback from instructors.

Institutional factors, including infrastructure and support services, also impact online learning motivation. The quality of learning management systems and available support services can significantly affect students' motivation (Lavidas et al, 2022). The integration of educational data mining (EDM) and constructionism can provide valuable insights for educators and administrators in designing engaging and meaningful online learning experiences (Berland et al., 2014). Additionally, institutional policies and regulations supporting e-learning can raise awareness among both instructors and students about the benefits of online learning systems (Cheng et al., 2012).

Academic factors, such as course content and instructional methods, can also influence learning motivation. Pedagogical quality and inclusive leadership significantly impact online learning motivation by fostering a positive and effective learning environment (Bhuttah et al., 2024). Rienties and Toetenel (2016) further argue that interactive and communicative learning activities can enhance student engagement and overall learning experiences.

Lastly, environmental factors play a crucial role in shaping learning motivation. Issues such as poor internet connectivity or difficulties in using online learning tools can lead to frustration and decreased motivation (Berestova et al., 2022). Zhang et al. (2004) also emphasized the need to improve online learning environments to enhance student motivation.

3. METHOD

3.1. Research model

Based on the theoretical foundations presented in the literature review, learning motivation is considered a key determinant of students' active participation and academic achievement in online learning environments. Previous studies have identified five major groups of factors influencing learning motivation: personal, instructor-related, institutional, academic, and environmental factors. Specifically, personal factors refer to students' self-study ability, self-discipline, time management skills, and technological proficiency. Instructor-related factors pertain to the level of support, timely feedback, teaching competence, and instructional style. Institutional factors include technological infrastructure, the learning management system, technical support services, and academic policies related to online learning. Academic factors involve

course content, teaching methods, assessment criteria, and the organization of interactive learning activities. Environmental factors are reflected in students' home study conditions, internet connectivity, support from family and peers, and the level of social interaction within the virtual learning space.

At Can Tho University, online teaching and learning activities are implemented through a Learning Management System (LMS) based on the open-source Moodle platform. This system enables students to access course materials, submit assignments, engage in discussions, and complete assessments online. Additionally, the university's digital library system offers a wide range of learning resources, including e-books, academic databases, and subject-specific materials provided by the Learning Resource Center and affiliated faculty libraries. Interactions between lecturers and students, as well as among students, are maintained through various channels, such as email, LMS forums, and virtual meeting platforms like Zoom and Google Meet.

Drawing on both theoretical and practical foundations, this study identifies five primary groups of factors influencing students' motivation for online learning at Can Tho University. These factors form the basis of the proposed research model, as illustrated in Figure 1, with specific observed variables detailed in Table 1, serving as the foundation for subsequent data collection and analysis.

The research model includes a control variable group and five key factors influencing students' online learning motivation. These five factors are measured through 24 observed variables using a five-point Likert scale (ranging from 1 - "Not at all influential" to 5 - "Highly influential"). Students' self-assessment of each factor will be analyzed to determine its impact on their online learning motivation.

Table 1. Explaining the variables in the model

Variable	Explanation
Personal Factors	
PF1	Level of personal interest in learning.
PF2	Learner's self-discipline.
PF3	Time management skills of the learner.
PF4	Learner's ability to use technology.
Lecturer Factors	
LF1	Timely and constructive feedback from lecturers.
LF2	Ability of lecturers to explain complex topics in an understandable manner.
LF3	Enthusiasm of lecturers for the subject.
LF4	Clear course structure provided by lecturers.
LF5	Responsiveness of lecturers to learners' questions and concerns.
Institutional Factors	
IF1	Accessibility of online learning resources (e.g., e-libraries, databases) provided by the institution.
IF2	Ease of use of the institution's online learning platform.
IF3	Technical support (e.g., IT help, troubleshooting) offered by the institution.
IF4	Availability of policies and updates related to online learning from the institution.
IF5	Availability of academic advising or tutoring services.
Academic Factors	
AF1	Relevance of course content to the learner's future career.
AF2	Workload of online courses.
AF3	Criteria and methods for assessment and grading.
AF4	Clarity of online learning objectives and outcomes.
AF5	Opportunities for interactive learning (e.g., group projects, discussions) in online courses.
Environmental Factors	
EF1	Stability of internet connection.
EF2	Distractions in the online learning environment.
EF3	Financial situation (e.g., affordability of necessary tools for online learning).
EF4	Flexibility of online learning schedules.
EF5	Support from family and friends.

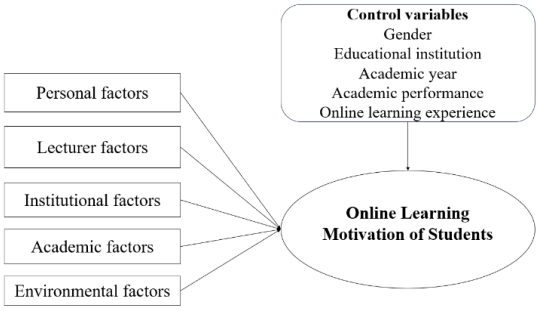

Figure 1. Research model`

3.2. Research methodology

The study sample was selected using stratified random sampling to ensure the representativeness of students at Can Tho University. A total of 892 students participated in the survey, stratified by academic discipline, year of study, gender, and academic performance. This stratification method reflects the characteristics of different academic fields, maintains balance across study years, gender, and performance levels, and facilitates the comparison of differences in online learning motivation.

Descriptive statistics of the participants are detailed in Tables 2 and 3.

The research data is analyzed using statistical methods to ensure accuracy and reliability. First, Cronbach's Alpha is used to assess the internal consistency of the measurement scales. Variables with low item-total correlations are considered for removal to improve reliability.

Next, exploratory factor analysis (EFA) is conducted to extract and group observed variables into meaningful factors, using the criterion of Eigenvalue > 1 and the Varimax rotation method to optimize the factor structure.

After identifying the key factors, multiple regression analysis is performed to evaluate the impact of independent variables on students' online learning motivation. The multiple linear regression model is tested using an ANOVA model fit test and multicollinearity diagnostics based on the Variance Inflation Factor (VIF) and Tolerance to ensure the accuracy of the estimates.

Table 2. Number of survey participants by academic units at Can Tho University

No.	Academic Unit	Quantity	Percentage (%)
1	College of Engineering Technology	330	37.0
2	School of Education	65	7.3
3	School of Information and Communication Technology (ICT)	71	8.0
4	School of Foreign Languages	45	5.0
5	School of Political Science	31	3.5
6	College of Natural Sciences	35	3.9
7	School of Law	37	4.1
8	College of Aquaculture & Fisheries	59	6.6
9	College of Environment & Natural Resources	57	6.4
10	School of Social Sciences and Humanities	48	5.4
11	College of Agriculture	71	8.0
12	College of Economics	43	4.8
Total		**892**	**100.0**

Finally, a one-way ANOVA test is applied to compare learning motivation across student groups based on demographic characteristics. Post-hoc Tukey HSD tests are used to identify specific groups with statistically significant differences, providing deeper insights into variations among different student groups.

Table 3. Descriptive statistics of survey participants

Survey Information	Content	Quantity	Percentage (%)
Gender	Male	494	55.4
	Female	398	44.6
Academic Year	1st Year	242	27.1
	2nd Year	387	43.4
	3rd Year	146	16.4
	4th Year	115	12.9
	5th Year	2	0.2
Academic Performance	Excellent	150	16.8
	Good	373	41.8
	Fair	317	35.5
	Average	52	5.8
Online Learning Experience	None	20	2.2
	Less than 1 year	187	21.0
	1–2 years	390	43.7
	More than 2 years	295	33.1

4. RESULTS AND DISCUSSION

The reliability analysis results indicate that all factors exhibit high reliability, with Cronbach's Alpha values ranging from 0.842 to 0.943. Specifically, the Personal Factors construct has a Cronbach's Alpha of 0.842; however, if item PF4 (Technology Usage Ability) is removed, the value increases to 0.850, suggesting that PF4 may not significantly contribute to the overall reliability. In contrast, other constructs, including Lecturer Factors (Cronbach's Alpha = 0.942), Institutional Factors (Cronbach's Alpha = 0.943), Academic Factors (Cronbach's Alpha = 0.919), and Environmental Factors (Cronbach's Alpha = 0.884), demonstrate strong reliability. The removal of any item from these constructs would result in a lower Cronbach's Alpha value, indicating that all items play a crucial role in the measurement scale.

The corrected item-total correlation analysis reveals that PF4 has the lowest correlation value (0.562), which is significantly lower than those of other items (ranging from 0.664 to 0.750). This finding further supports the conclusion that PF4 has limited effectiveness in measuring the construct. Consequently, PF4 was removed to enhance the reliability of the Personal Factors scale. For the remaining constructs, all items exhibit strong corrected item-total correlations (≥ 0.653), and no further adjustments were necessary.

The validity test results in Table 4 confirm that the data meet the requirements for conducting factor analysis. Several variables, including AF5, AF2, AF1, AF4, and AF3, which belong to the academic factor, have no significant factor loadings. This indicates that these variables are either too weak or have an insignificant impact on students' online learning motivation.

The KMO index of 0.961 indicates a very high suitability, indicating strong intercorrelations among the variables. Bartlett's Test yields a Chi-Square value of 14,751.043 with a significance level (Sig.) of 0.000, confirming the correlation between variables and meeting the conditions for exploratory factor analysis (EFA).

Three extracted factors have eigenvalues greater than 1, and the total variance explained reaches 73.459%, exceeding the minimum threshold of 60%, indicating that the model effectively explains the survey data. The Varimax rotation method clearly groups the variables into three distinct factors: (F1) "Personal and Instructor-related Factors", which include variables associated with students' individual characteristics and instructor support; (F2) "Institutional Factors", which reflect the support services and infrastructure for online learning; and (F3) "Environmental Factors", which encompass external influences such as financial conditions, study environment, and family support.

The extracted three-factor model is meaningful and aligns with the research objectives. The KMO index, Bartlett's test, and variance explained all meet the required thresholds, ensuring reliability. The factor groups exhibit high loadings (>0.5) and no problematic variables, confirming the measurement scale's stability.

The analysis results in Table 5 indicate that the regression model is statistically significant, with $F = 34.585$ and Sig. = 0.000, suggesting that at least one

independent variable (F1, F2, or F3) has a significant impact on online learning motivation. Among the predictors, Personal and Instructor-related Factors (Beta = 0.254, Sig. = 0.000) exert the strongest positive influence, followed by Institutional Factors (Beta = 0.153, Sig. = 0.003) with a weaker positive effect. In contrast, Environmental Factors (Beta = -0.107, Sig. = 0.018) have a negative impact. These findings highlight the need to enhance personal and instructor-related factors while mitigating the adverse effects of environmental factors.

The results align with previous studies, such as Berestova et al. (2022), which emphasized the critical role of personal and instructor-related factors in learning motivation. Similarly, Gedera et al. (2015) identified institutional factors as positively influencing student engagement in online courses. Additionally, studies by Meşe et al. (2021) and Hamidah (2022) indicated that environmental factors could negatively impact learning motivation.

This study provides valuable insights into the factors influencing online learning motivation, underscoring the importance of strengthening personal and instructor-related factors while minimizing the negative effects of the learning environment.

Table 4. Exploratory factor analysis results

Variable	Factor		
	1	2	3
PF2	0.720		
LF2	0.718		
LF1	0.693		
LF3	0.675		
PF1	0.640		
PF3	0.631		
LF4	0.620		
LF5	0.604		
IF5		0.798	
IF 4		0.770	
IF 3		0.750	
IF 2		0.719	
IF 1		0.690	
EF3			0.739
EF 2			0.700
EF 4			0.686
EF 1			0.661
EF 5			0.568
Eigenvalues	10.648	1.339	1.235
KMO		0.961	
Approx. Chi-Square		14,751.043	
Sig.		0.000	

Table 5. Multiple regression analysis results

Model	Standardized Coefficients	t	Sig.	Collinearity Statistics	
	Beta			Tolerance	VIF
Constant		16.159	0.000		
F1	0.254	4.955	0.000	0.364	2.744
F2	0.153	2.999	0.003	0.370	2.702
F3	-0.107	-2.371	0.018	0.475	2.106
Sig.		0.000			
F		34.585			
R Square		0.442			
Adjustef R square		0.454			

The study analyzes the impact of control variables related to student characteristics on online learning motivation among students at Can Tho University. The results in Table 6 indicate that students from the Faculty of Education have lower academic motivation compared to those from the Faculty of Natural Sciences and the Faculty of Agriculture (p = 0.002). This aligns with the study by Gedera et al. (2015), which identified organizational learning factors as influential in student motivation and engagement in online courses. The differences among faculties reflect varying teaching methods and learning environments, as emphasized by Cheng et al. (2012).

Regarding academic performance, the group with excellent results showed higher motivation (p = 0.028), consistent with Bhuttah et al. (2024), who found that academic success can enhance learning motivation. Additionally, the experience in online learning demonstrated a clear distinction, with the group having more than two years of experience achieving the highest scores (p = 0.001), corroborating Meşe et al. (2021) on the importance of experience and instructor support in maintaining learning motivation.

Finally, there were no significant differences between gender groups (p = 0.950) and years of

study (p = 0.081). This aligns with Hamidah's (2022) findings, indicating that personal factors such as gender and study duration are not decisive in fostering learning motivation. These results highlight the importance of the learning environment and academic performance in enhancing students' motivation to learn.

Table 6. Comparison of students' learning motivation based on personal characteristics

Variable	p-value	Impact
Gender	0.950	No significant difference
Educational Institution	0.002	A significant difference exists only between students from the Faculty of Education and those from the Faculty of Natural Sciences and the Agricultural School, indicating that students from the Faculty of Education have lower online learning motivation than those from the other two groups. Other groups show no statistically significant differences.
Academic Year	0.081	No significant difference
Academic Performance	0.028	Students with excellent academic performance have higher motivation for online learning than the other groups.
Learning Experience	0.001	The group with more than 2 years of online learning has the highest scores, which are significantly higher than those of the group with less than 1 year. The groups with 1-2 years and "never" show no significant differences in scores.

5. CONCLUSION AND RECOMMENDATIONS

This study analyzes the factors affecting university students' motivation for online learning at Can Tho University, including personal factors, instructor-related factors, institutional factors, academic factors, and environmental factors. The findings indicate that personal and instructor-related factors have the greatest positive impact, underscoring the importance of self-discipline, time management, and instructor support in enhancing students' motivation. Institutional factors also play a crucial role, particularly in terms of learning infrastructure and online support services.

However, environmental factors exert a negative influence, suggesting that barriers such as poor internet connectivity, financial constraints, and distractions during online learning can reduce students' motivation. Additionally, the study reveals that academic performance and prior online learning experience are critical determinants, with students who achieve higher academic standards and have more extensive online learning experience generally demonstrating stronger motivation. Significant differences were also observed among different academic disciplines, emphasizing the need to tailor teaching methods and learning support to the specific characteristics of each field of study.

Compared with previous studies, this research identifies both similarities and notable differences. Specifically, it highlights the strong influence of lecturers and individual factors on students' motivation for online learning, whereas some prior studies have placed greater emphasis on institutional support (Tang et al., 2023). This discrepancy may be attributed to differences in educational contexts, the maturity of online learning systems, and students' self-study habits. Additionally, this study finds that students with greater online learning experience tend to have higher motivation, which contrasts with Rienties & Toetenel's (2016) findings. This difference may stem from the uneven development of online support systems across different faculties at Can Tho University. These variations underscore the necessity of tailored teaching strategies that align with the specific characteristics of students at each educational institution.

Based on these findings, the study proposes several solutions to enhance students' motivation for online learning:

5.1. Enhancing personal competencies and teaching quality

Develop students' personal skills: Universities should offer courses on self-learning, time management, self-discipline, and the effective use of technology to help students become more proactive in online learning. Additionally, first-year orientation programs should be implemented to establish a solid foundation from the beginning.

Improve teaching quality: Faculty training should focus on modern online teaching methodologies, particularly on providing timely feedback, clear guidance, and maintaining student engagement through interactive activities such as group discussions and project-based learning.

Leverage students' online learning experiences: Encourage students with over 2 years of online learning experience to share effective study strategies with new students through mentoring sessions, discussion forums, and peer-learning initiatives, fostering a strong learning community.

Enhancing interaction and feedback: Lecturers should actively foster interactive learning environments by providing regular and constructive feedback, organizing group discussions during online sessions via platforms such as Google Meet and Zoom. Additionally, various motivational strategies—such as bonus points, rewards, and regular assignment postings on the LMS—should be implemented to encourage student participation and allow instructors to monitor learning progress effectively.

Improving digital competence of lecturers and students: The university should offer regular training programs to enhance lecturers' online teaching capabilities, including effective LMS use, digital content development, and interactive activity design. Simultaneously, students should be supported in developing digital learning competencies, particularly in information searching, use of learning resources, and online collaboration.

5.2. Strengthening institutional support and infrastructure

Upgrade technical infrastructure: Enhance online learning platforms to ensure stability, user-friendliness, and improved accessibility to academic resources, including digital libraries and databases, with prompt technical support.

Expand student support services: Provide academic counselling, online tutoring, and responsive student support services to address learning difficulties. Additionally, develop personalized learning pathways tailored to students' academic performance and capabilities.

Adapt policies to specific academic disciplines: Given the differences in learning motivation across faculties, tailored policies should be implemented. For example, the Faculty of Education could integrate more technology-driven teaching strategies to boost engagement, while other faculties might focus on active learning methodologies.

Learning Management System (LMS): Information and Network Management Center should ensure that the LMS operates stably, features a user-friendly interface, and integrates essential tools to support teaching and learning, such as discussion forums, online assessments, and course notifications. These functions aim to facilitate easy and effective access for both lecturers and students.

Digital learning resources: A high-quality, easily accessible repository of digital resources should be developed in alignment with the academic curriculum. This enables students to proactively access and engage with learning materials anytime and anywhere, thereby promoting self-directed learning and improving academic performance.

5.3. Improving the online learning environment and financial support

Create an effective learning environment: Guide students in setting up conducive study spaces, minimizing distractions, and managing their study time effectively to enhance online learning efficiency.

Reduce financial barriers: Implement financial aid programs, scholarships, or affordable learning device provisions to support students from disadvantaged backgrounds and enable them to fully engage in online education.

Strengthen family and peer support: Launch awareness campaigns to educate families on the importance of online learning, fostering a supportive environment that enhances student motivation and academic success.

These findings contribute not only to a deeper understanding of the factors influencing students' motivation for online learning but also provide a scientific basis for developing policies and strategies to enhance the quality of online education at Can Tho University in the modern educational context.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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