



ChatGPT Use and Self-reported Learning Effectiveness among International Students at RSU: The Mediating Role of Student Attitudes

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Abstract

University students have recently started relying on generative AI such as ChatGPT in the context of academic learning. Yet there is a lack of empirical evidence on its pedagogical effectiveness among Thai higher education students in general and international students in particular, where institutional deployment and student use are often out of sync. This study seeks to explore the linkage between ChatGPT use, international students' learning attitudes (i.e., perceived usefulness, motivation, trust, and learning anxiety), and self-reported learning effectiveness. It also examines the mediating role of student attitudes in the relationship between ChatGPT use and perceived learning outcomes. A cross-sectional survey research design was employed. A total of 400 international undergraduate students at Rangsit University who had prior experience using ChatGPT for academic purposes participated in the study. A structured questionnaire using a five-point Likert scale was utilized. Descriptive statistics, reliability analysis, Pearson correlation, multiple regression, and mediation analysis were used to analyze the data.

The results indicate that overall, students had a positive attitude towards ChatGPT, and they viewed it as a supporting system for learning. Learning motivation and trust were positively correlated with ChatGPT use. Such use, however, did not directly predict self-reported learning effectiveness. Motivation was found to be a significant positive predictor, and excessive trust had a negative association with learning effectiveness, implicating the potential danger of overreliance. ChatGPT was found to improve learning when used as a reflective tool. Student motivation rather than frequency in using AI tools is more critical, highlighting the need for pedagogical support.

Keywords: ChatGPT, generative AI, student attitudes, learning effectiveness, international students, AI in education, higher education

1. Introduction

Artificial intelligence has rapidly evolved from an experimental innovation into a transformative technology with significant implications for higher education. Generative artificial intelligence (GAI) systems such as ChatGPT enable students to generate explanations, draft academic texts, receive feedback, and interact with adaptive language models in real time. In contrast to previous technology-mediated educational tools that supported instructional content delivery or assessment automation, generative AI introduces an interactive and dialogic capability that might shape how students approach learning tasks (Holmes et al., 2023; Kasneci et al., 2023; Miao & Holmes, 2023).

The pedagogical challenges and questions of generative AI remain contested despite its ubiquitous presence. Previous studies show that AI-supported systems can support engagement, learning efficiency, and usefulness (Kasneci et al., 2023; Zawacki-Richter et al., 2019). Other scholars, though, warn that the uncritical use of AI outputs could erode higher-order thinking skills, academic integrity, and deep cognitive processing (Dwivedi et al., 2023; Rudolph et al., 2023). These divergent views suggest that simply using AI may not lead to better learning outcomes, and instead how learners engage cognitively and motivationally with AI-supported tools will explain whether improvements occur.



Further insights into this issue can be found in theoretical models of technology adoption. Studies based on the Technology Acceptance Model (TAM) identify perceived benefits associated with technology usage and positive attitudes toward the use of technology as significant predictors in higher education environments (Al-Emran et al., 2018; Davis, 1989; Venkatesh et al., 2003). On the other hand, motivational theories assert that meaningful learning through technology does not solely rely on access to technological devices (Deci & Ryan, 2000; Schunk et al., 2014). When applied to generative AI, this theoretical distinction raises an important question that underpins this study: if students may perceive ChatGPT as useful and adopt it frequently, does such use improve learning effectiveness per se, or is the relationship mediated by motivational and attitudinal factors?

Focusing on empirical research in Thai higher education, studies so far have been mostly concerned with digital readiness and technology acceptance in general rather than learning processes specifically for generative AI environments (Phothongsunan, 2023; Siripipat & Wongwanich, 2024). In terms of its AI readiness at the policy level, Thailand has started to tackle this matter and is engaging in national and international discussions such as those supported by UNESCO (UNESCO, 2025; Ministry of Higher Education, Science, Research and Innovation, 2024). Assessments on AI adoption and governance capacity in Thailand have begun. However, generative AI is increasingly seen as an appropriate tool in the academic context, and its integration into curriculum design and assessment practices remains limited at the institutional level. This means that many students are using tools like ChatGPT independently without formal pedagogical input or guidance from their institution.

That gap is especially salient for international students. International learners from multilingual and multicultural academic environments often encounter issues of language proficiency, academic discourse, and self-regulation. Research has shown that factors like situational interest, computer self-efficacy, and self-regulation contribute to the maintenance of engagement and learning in technology-based environments (Sun & Rueda, 2012; Zimmerman, 2002). Generative AI may act, therefore, as linguistic and cognitive scaffolding tools for international students. On the downside, overreliance on AI output may decrease the critical engagement and individual autonomy of learners with these produced materials, causing a loss of depth in learning (Bandura, 1997; Ajzen, 1991). In that, trust in AI reflects a bifaceted construction, adding confidence but also the risk of being dependent.

While previous research recognizes perceived usefulness, motivation, and trust as significant factors in technology-enhanced learning (Al-Emran et al., 2018; Venkatesh et al., 2003), there has been relatively little empirical work exploring the mediating role of these attitudinal factors in the relationship between generative AI use and learning effectiveness. Much of the current literature explores adoption patterns or ethical concerns but does not make clear tests on the psychological processes that drive how AI use affects perceptions of educational outcomes.

International students constitute a diverse and expanding academic community at Rangsit University (RSU). Anecdotal evidence suggests that ChatGPT is widely used to assist with academic tasks, but systematic investigation of the relationship between such use and student attitudes toward learning and self-reported effectiveness in learning is limited. Such relations should inform pedagogical design and institutional policy, as well as the responsible integration of AI into higher education.

Thus, the current study aims to examine the relationships between ChatGPT use, international students' learning attitudes (i.e., perceived usefulness, motivation, trust, and learning anxiety), and self-reported learning effectiveness at RSU. By combining technology acceptance theory and motivational theory and testing the mediating effects of student attitudes empirically, this study seeks to clarify whether generative AI is a direct determinant of learning outcomes or if it acts as an artifact whose pedagogical worth derives from students' motivated engagement with it and appropriate use.

1.1 Conceptual Framework

This study proposes a model to explore the association between ChatGPT usage with self-reported learning effectiveness among international students at Rangsit University. ChatGPT adoption is taken as the independent variable, whereas student attitudes (including motivation, trust, perceived usefulness, and



learning anxiety) are used as mediating factors that affect students' self-reported learning effectiveness. Academic outcomes are then manifested in the perceived quality of assignments, academic confidence, and expected grade increase. Figure 1 illustrates the framework.

The framework assumes that ChatGPT use influences student attitudes, which in turn affect perceived learning effectiveness. Student attitudes are therefore treated as mediating variables between technology use and learning outcomes.

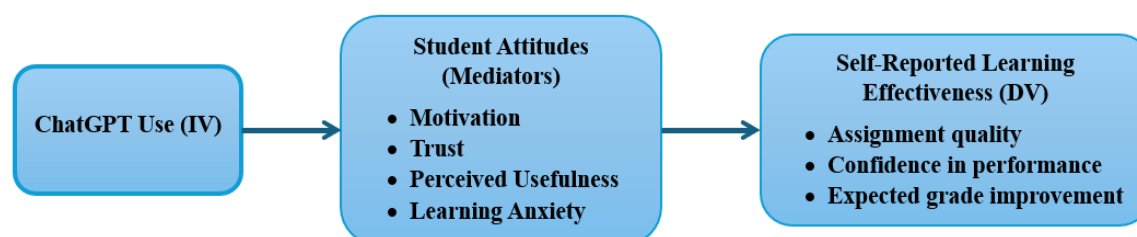


Figure 1 Conceptual Framework of the Study

2. Objectives

Given the context and the problem of this study, the research purposes were developed to explore how ChatGPT contributed or did not contribute to the learning of international students at Rangsit University. More specifically, this study explores the relationship between student perceptions and usage of ChatGPT and its influence on perceived learning outcomes in a higher education setting.

The specific objectives of this study are as follows:

- 1) To examine the relationship between ChatGPT use and international students' attitudes toward learning, specifically perceived usefulness, motivation, trust, and learning anxiety.
- 2) To assess the direct effect of ChatGPT on international students' self-reported learning effectiveness.
- 3) To analyze how students' attitudes toward ChatGPT relate to their self-reported learning effectiveness.
- 4) To examine the mediating role of student attitudes in the relationship between ChatGPT use and self-reported learning effectiveness.

3. Materials and Methods

3.1 Research Design and Participants

Data were collected using an online questionnaire in October 2023 from participants who reported their use of ChatGPT, their attitudes towards its use, and their self-reported learning effectiveness. Data collection was conducted during the 2025 academic year with international undergraduate students at Rangsit University who had previous experience using ChatGPT for academic purposes.

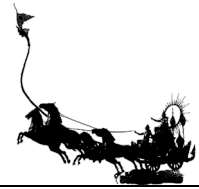
The population was about 1,038 international students at the undergraduate level across the university. Using Slovin's formula with a 95% confidence level, the minimum sample size needed was determined to be 289 respondents. Using convenience sampling, a total of 400 valid responses were collected to ensure adequate statistical power for correlation, regression, and mediation analyses.

Participation was voluntary and anonymous. The survey was completed online through Google Forms, and it was available through a QR code or a direct link.

3.2 Measurement Model and Instrument Development

The questionnaire was constructed using theoretical frameworks, namely the Technology Acceptance Model and motivational learning theories. The measurement items were adapted from previous validated studies and adjusted to suit the generative AI learning context.

The instrument consisted of five sections:



1. Demographic information and screening questions
2. ChatGPT usage patterns
3. Student attitudes toward ChatGPT
4. Self-reported learning effectiveness
5. Open-ended reflections on usage and ethical considerations

All scale items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The measurement model included the following latent constructs:

- ChatGPT Use (frequency and academic utilization behaviors)
- Perceived Usefulness
- Motivation / Engagement
- Trust in AI-generated responses
- Learning Anxiety / Ethical concerns
- Self-Reported Learning Effectiveness (perceived improvement in assignment quality, academic confidence, and expected grade performance)

Cronbach's alpha was used to assess internal consistency reliability. All constructs showed acceptable to good reliability ($\alpha > .70$), which suggests satisfactory internal consistency for the subsequent analysis.

Although confirmatory factor analysis (CFA) was not conducted due to software limitations, item grouping followed a theoretical structure and prior validated frameworks to support construct validity.

3.3 Data Analysis Procedures

Statistical analyses were performed in PSPP (GNU Project statistical solution). Data were screened and coded, and missing values were investigated before analysis.

The analytical procedure followed four sequential steps:

Step 1: Descriptive Analysis

Means, standard deviations, minimum and maximum values were calculated to summarize key constructs.

Step 2: Reliability Testing

Cronbach's alpha coefficients were computed to evaluate internal consistency of the measurement scales.

Step 3: Correlation Analysis

Pearson's correlation coefficients were calculated to examine bivariate relationships among ChatGPT use, student attitudes, and self-reported learning effectiveness.

Step 4: Multiple Regression and Mediation Testing

Multiple regression analysis was conducted to examine:

- The direct effect of ChatGPT use on learning effectiveness
- The effect of student attitudes on learning effectiveness

Mediation analysis followed the regression-based causal steps approach. Specifically:

1. ChatGPT use predicting learning effectiveness
2. ChatGPT use predicting mediators
3. Mediators predicting effectiveness
4. Reduction in the direct effect after including mediators

Because PSPP was used, bootstrapping procedures (e.g., PROCESS macro) were not possible. As a result, the mediation was estimated through comparison between regression paths instead of using bias-corrected confidence intervals. This is a methodological limitation and indicates that future research could utilize structural equation modeling or bootstrapped mediation analysis for stronger estimation.

3.4 Regression Assumption Testing

Before conducting regression analyses, key statistical assumptions were evaluated:

1. Linearity – Scatterplots were inspected to verify linear relationships between predictors and dependent variables.



2. Normality – Residual distributions were examined through histograms and normal probability plots.
3. Homoscedasticity – Residual plots were assessed to ensure constant variance across predicted values.
4. Multicollinearity – Correlation coefficients among predictors were examined to ensure no excessive intercorrelation ($r < .80$).

No extreme assumption violations were identified, and thus, the data were suitable for further regression-based analysis.

3.5 Software Considerations and Limitations

PSPP was chosen because it is open-source and compatible with institutional resources. PSPP supports descriptive statistics, correlation, and regression analysis, but advanced modeling capabilities are limited, including:

- Structural Equation Modeling (SEM)
- Bootstrapped mediation analysis
- Confirmatory factor analysis

Consequently, mediation analysis was performed using regression-based procedures rather than structural modeling. Software packages such as SPSS with PROCESS macro, AMOS, or SmartPLS may be used in future studies to obtain more robust analytical estimation and measurement model fit.

4. Results

The results are reported in this section through analysis of quantitative data. Findings are categorized into two groups based on the profile of respondents and results of hypothesis testing (H_{01} – H_{07}). For each hypothesis, the statistical approach and major findings are documented. Discussion is incorporated into each subsection to relate the results towards current publications and study purpose.

4.1 Respondents' Background and Descriptive Statistics

The descriptive statistics were calculated to describe key study constructs, such as ChatGPT use, perceived usefulness, motivation, trust, learning anxiety, and self-reported learning effectiveness. The mean scores and standard deviations are shown in Table 1.

Table 1 Descriptive Statistics of Key Constructs (N = 400)

Variable	Mean	Standard Deviation	Minimum	Maximum
ChatGPT Use	4.08	0.23	3.40	4.80
Motivation / Engagement	4.14	0.37	3.00	5.00
Trust	4.11	0.36	3.00	5.00
Learning Anxiety / Ethics	4.14	0.38	3.00	5.00
Self-Reported Learning Effectiveness	4.09	0.30	3.20	4.80

The high mean values of all constructs suggest that perceptions of ChatGPT as a learning-support tool are generally positive. Motivation and perceived usefulness emerged as particularly strong dimensions, suggesting that students view ChatGPT as a useful interactive study tool that enhances both engagement and understanding. These findings are consistent with previous research on technology acceptance and AI-enhanced learning, which highlights perceived usefulness and motivation as key factors in fostering positive learning experiences.

4.2 Hypothesis Testing Results

H_{01} : ChatGPT use has no significant effect on perceived usefulness.

A Pearson correlation analysis was conducted to examine whether ChatGPT use was associated with perceived usefulness with the result shown in Table 2 below:

**Table 2** Relationship Between ChatGPT Use and Perceived Usefulness

Variable	r	p-value
ChatGPT Use → Perceived Usefulness	0.18	< .05

Decision: H₀₁ is rejected - ChatGPT use has a significant effect on perceived usefulness

The results in Table 2 revealed a weak but significant positive relationship between ChatGPT use and perceived usefulness. This indicates that the more learners are exposed to ChatGPT, the more they perceive it as useful for academic work. This finding is consistent with the Technology Acceptance Model, which suggests that greater experience with technology enhances perceptions of its usefulness.

H₀₂: ChatGPT use has no significant effect on motivation.

A Pearson correlation analysis was conducted to test the relationship between ChatGPT use and student motivation, with the result shown in Table 3 below:

Table 3 Relationship Between ChatGPT Use and Motivation

Variable	r	p-value
ChatGPT Use → Motivation	0.18	< .05

Decision: H₀₂ is rejected - ChatGPT use has a significant effect on motivation.

The usage of ChatGPT was positively correlated with motivation, suggesting that AI-supported learning tools can encourage students' involvement and interest in their academic tasks. This is consistent with self-determination theory, which emphasizes the importance of supportive resources in developing intrinsic motivation. It cannot verify primary sources. This limits scholarly rigor.

H₀₃: ChatGPT use has no significant effect on trust.

A Pearson correlation analysis was conducted to test the relationship between ChatGPT use and students' trust, with the result shown in Table 4 below:

Table 4 Relationship Between ChatGPT Use and Trust

Variable	r	p-value
ChatGPT Use → Trust	0.12	< .05

Decision: H₀₃ is rejected - ChatGPT use has a significant effect on trust.

The significant positive relationship between ChatGPT usage and trust indicates that repeated use adds to one's confidence in answers generated by AI. However, as subsequent findings suggest, greater trust does not always lead to better learning outcomes given the risk of overtrust.

H₀₄: ChatGPT use has no significant effect on learning anxiety.

A Pearson correlation analysis was conducted to test the relationship between ChatGPT use and learning anxiety, with the result shown in Table 5 below:

Table 5 Relationship Between ChatGPT Use and Learning Anxiety

Variable	r	p-value
ChatGPT Use → Learning Anxiety	0.05	< .05

Decision: H₀₄ is accepted - ChatGPT use has no significant effect on learning anxiety.

No significant relationship was found between learning anxiety and the use of ChatGPT. This suggests that while students may be aware of ethical concerns or experience some level of anxiety related to AI use, these feelings do not appear to increase with more frequent use of ChatGPT. Instead, learning anxiety may be shaped more strongly by contextual factors such as institutional policies, assessment design, or students' ethical sensitivity.

H₀₅: Student attitudes do not significantly influence self-reported learning effectiveness.

A multiple regression analysis was conducted to test whether attitudes had a significant effect on self-reported learning effectiveness.

**Table 6** Effects of Student Attitudes on Learning Effectiveness

Predictor	β	<i>p-value</i>
Motivation	0.10	< .05
Trust	-0.14	< .01

Decision: H₀₅ is rejected - student attitudes have a significant effect on self-reported learning effectiveness.

Among the attitudinal dimensions, motivation emerged as the strongest positive contributor to learning effectiveness, while trust exerted a negative effect. This pattern suggests that learners who actively perceive themselves as engaged and motivated are more likely to benefit from AI-supported learning, whereas excessive trust in AI may reduce critical engagement and lead to more superficial learning. This finding aligns with existing literature that cautions against uncritical or blind reliance on generative AI.

H₀₆: Student attitudes do not mediate the relationship between ChatGPT use and learning effectiveness.

A mediation analysis was conducted to examine whether student attitudes mediated the relationship between ChatGPT use and self-reported learning effectiveness with the results shown in Table 7 below:

Table 7 Summary of Mediation Results

Mediator	Mediation Effect	Result
Motivation	Partial	Supported
Trust	None	Not supported

Decision: H₀₆ is partially rejected

Motivation showed a partial mediation effect and therefore supported the mediation hypothesis, whereas trust did not demonstrate a mediation effect. Accordingly, H₀₆ was partially rejected. The results indicate that ChatGPT influences learning effectiveness in part through increased motivation rather than solely through a direct effect. In contrast, trust did not mediate this relationship, suggesting that trust alone is insufficient to enhance learning outcomes without learners' active cognitive engagement.

H₀₇: ChatGPT use has no significant direct effect on learning effectiveness.

A multiple regression analysis was conducted to examine whether ChatGPT use had a significant direct effect on self-reported learning effectiveness. The results are shown in Table 8 below:

Table 8 Direct Effect of ChatGPT Use on Learning Effectiveness

Predictor	<i>r</i>	<i>p-value</i>
ChatGPT Use	0.09	< .05

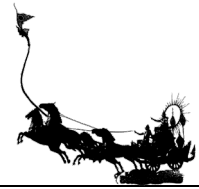
Decision: H₀₇ is accepted - ChatGPT use has no significant direct effect on learning effectiveness.

The use of ChatGPT did not directly influence self-reported learning effectiveness. This finding implies that the role of AI tools is complementary in relation to learning outcomes, rather than direct determinants. This suggests that learning effectiveness is shaped more by how students engage with the tool rather than by how frequently ChatGPT is used.

Discussion of Results

This study examined how ChatGPT use relates to students' perceptions, attitudes, and self-reported learning effectiveness. Overall findings suggest that ChatGPT influences learning mainly indirectly by shaping students' attitudes toward learning, rather than through a direct effect on learning outcomes. Greater exposure to ChatGPT leads students to view the tool as useful, motivating, and trustworthy. This perception of usefulness is consistent with the Technology Acceptance Model, which emphasizes the role of experience in shaping judgments about a technology's value.

Similarly, ChatGPT appears to support student motivation, aligning with self-determination theory by encouraging engagement and interest in learning activities. These favorable perceptions, however, have



clear limitations. While familiarity with ChatGPT may increase students' confidence in AI-generated outputs, excessive trust appears to weaken critical engagement and contribute to more superficial learning. This finding reflects concerns in the existing literature regarding uncritical reliance on generative AI. At the same time, increased use of ChatGPT does not appear to intensify learning anxiety, suggesting that such concerns are more likely influenced by institutional policies, assessment design, or ethical sensitivity rather than AI use itself.

The findings further indicate that student attitudes—particularly motivation—are central to learning effectiveness. ChatGPT appears to support learning primarily by enhancing students' motivational engagement, rather than by directly improving learning outcomes. Trust in AI, on its own, is insufficient to enhance learning without active cognitive involvement. Taken together, the results suggest that AI tools such as ChatGPT function best as complementary learning supports, with learning effectiveness shaped less by frequency of use and more by how students engage with the tool in ways that sustain motivation and critical thinking.

5. Conclusion

This study achieved its research objectives by clarifying the relationships between ChatGPT use, international students' learning attitudes, and self-reported learning effectiveness. It demonstrated that ChatGPT use relates primarily to students' attitudes rather than directly to learning outcomes, with motivation playing a central mediating role. The study also highlighted that trust and learning anxiety operate differently from motivation, underscoring the need for critical and reflective engagement with AI tools. Building on these conclusions, the following sections outline the study's academic and practical contributions, acknowledge its limitations, and propose directions for future research and practice.

5.1 Contributions of the Study

Academically, this study contributes to the emerging literature on generative AI in education by empirically examining the mediating role of student attitudes in AI-supported learning. The findings extend technology acceptance and motivation research by indicating that AI use alone does not necessarily translate into enhanced learning outcomes. Instead, psychological and behavioral factors, particularly motivation, shape how AI use becomes meaningful learning. The study also draws attention to the risks of overtrust in generative AI and highlights the role of critical thinking and AI literacy in addressing these concerns in higher education.

Practically, the findings are relevant for higher education institutions, educational technology developers, and policymakers. For universities, the results suggest that effective AI integration depends less on access to tools and more on pedagogical design, instructor support, and student motivation. Structured AI-enhanced tasks, ethical use guidelines, and assessment approaches informed by critical thinking may help maximize learning benefits while reducing dependency risks. For AI developers and providers, the study indicates that educational value lies not only in technical functionality but also in how tools encourage reflection, self-regulation, and purposeful use. More broadly, the findings underscore the importance of responsible AI deployment strategies that balance efficiency, learning quality, and ethical considerations.

In sum, ChatGPT functions as a pedagogical aid rather than a determinant of learning effectiveness. Its educational value is realized insofar as it supports motivated, critical, and reflective learning. Framing AI adoption through sound pedagogy and ethical reflection allows higher education institutions and educational technology providers to enhance student learning experiences while safeguarding academic integrity and long-term educational goals.

5.2 Limitations of the Study

First, self-reported data might be influenced by response bias. Participants may provide socially desirable responses or overestimate learning effectiveness when reporting their experiences with ChatGPT. Accordingly, self-reported learning achievement might not be completely consistent with actual academic performance.



Second, the cross-sectional design limited data collection to a single point in time, restricting the ability to draw causal inferences between ChatGPT use and learning effectiveness. Changes in student attitudes and learning behaviors over time were therefore not captured.

Third, the study was conducted within a single institutional context, which may limit the generalizability of the findings. Differences in institutional policies, academic cultures, and approaches to integrating AI into curricula may influence students' experiences with generative AI across educational settings.

Fourth, the study primarily employed quantitative methods, focusing on statistical relationships while not accounting for broader behavioral, psychological, and contextual factors. Qualitative insights, such as student reflections or instructional perspectives, were not examined.

Finally, the study considered a limited set of attitudinal variables, including perceived usefulness, motivation, trust, and learning anxiety. Other potentially influential factors—such as AI literacy, critical thinking skills, academic discipline, and course design—were not incorporated into the analytical model.

5.3 Suggestions and Recommendations

Based on the findings and limitations of this study, several recommendations are proposed for academic practice, institutional policy, and future research.

5.3.1 Academic and Educational Recommendations

Colleges and universities should establish clear guidelines for responsible ChatGPT use to ensure that AI supports learning rather than replaces independent thinking. One possible approach is to embed AI literacy education into university curricula, enabling students to critically and responsibly evaluate AI-generated content.

Educators are encouraged to integrate teaching activities that promote active learning, such as reflection tasks, problem-solving challenges, and critical appraisal exercises, in which students are required to scrutinize AI-provided information. These practices may enhance student motivation while reducing overreliance on AI resources.

In addition, curriculum developers should pay greater attention to learner motivation and engagement, as indicated by the findings that motivation plays a key role in learning effectiveness. AI-supported learning activities should therefore emphasize interaction, creativity, and learner self-direction rather than passive consumption of information.

5.3.2 Institutional and Business Recommendations

Higher education institutions and policymakers should develop explicit policies governing the use of generative AI, particularly regarding ethical considerations, academic integrity, and appropriate use guidelines. Such policies are necessary to balance technological innovation with responsible academic practice.

Educational technology developers and AI service providers should consider designing tools that support not only answer generation but also learning reflection, guided feedback, and critical questioning. Greater transparency in AI-generated responses may help reduce uncritical trust and encourage more reflective and analytical engagement among users.

Furthermore, universities could collaborate with AI technology companies to develop personalized educational AI platforms that align with institutional learning objectives and students' needs. Such collaborations have the potential to enhance educational outcomes while also contributing to the development of the digital education market.

5.3.3 Recommendations for Future Research

Future studies may adopt longitudinal research designs to examine changes in ChatGPT use, student attitudes, and learning outcomes over time, particularly in relation to long-term academic performance. Researchers are also encouraged to employ mixed-method approaches that combine quantitative surveys with



qualitative methods such as interviews or classroom observations. This approach would provide richer insights into how generative AI is used in authentic learning contexts.

In addition, future research should explore a wider range of variables, including AI literacy, critical thinking skills, academic discipline differences, and cultural factors, which may influence AI adoption and learning effectiveness. Finally, comparative studies across different institutions, countries, or educational systems are recommended to enhance the generalizability of findings and to provide a broader understanding of generative AI integration in higher education.

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7. References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Al-Emran, M., Mezhyuev, V., & Kamaludin, A. (2018). Technology acceptance model in m-learning context: A systematic review. *Computers & Education*, 125, 389–412. <https://doi.org/10.1016/j.compedu.2018.06.008>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., ... & Wright, R. (2023). Opinion paper: “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, Article 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Holmes, W., Bialik, M., & Fadel, C. (2023). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., ... & Kasneci, G. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, Article 102274. <https://doi.org/10.1016/j.lindif.2023.102274>



- Miao, F., & Holmes, W. (2023). *Guidance for generative AI in education and research*. UNESCO.
- Ministry of Higher Education, Science, Research and Innovation. (2024). *Policy framework for artificial intelligence integration in Thai higher education*. Government of Thailand.
- Phothongsunan, S. (2023). Technology acceptance and readiness for e-learning in Thai universities. *Journal of Educational Technology Development*, 15(2), 45–60.
- Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning & Teaching*, 6(1), 342-363.
- Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications* (4th ed.). Pearson.
- Siripipat, K., & Wongwanich, S. (2024). Digital learning readiness and technology acceptance among university students in Thailand. *Asian Journal of Education and Learning*, 12(1), 21–38.
- Sun, J. C.-Y., & Rueda, R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *Computers & Education*, 59(2), 564–575. <https://doi.org/10.1016/j.compedu.2012.03.007>
- UNESCO. (2025). *Thailand: Artificial intelligence readiness assessment report*. UNESCO.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Zawacki-Richter, O., et al. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 1–27. <https://doi.org/10.1186/s41239-019-0171-0>
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2