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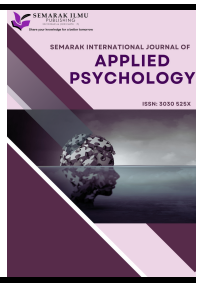

The Relationship Between ChatGPT Reliance and Self-Efficacy Among Three Private Universities in Malaysia

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ABSTRACT

Generative Artificial Intelligence (AI) applications like ChatGPT represent a new wave of educational technology that integrates instant information delivery, content creation, and language assistance. While often linked to productivity gains, their psychological impact, particularly on students' academic self-efficacy remains underexplored. This study aimed to determine whether ChatGPT use and UTAUT constructs predict students' academic self-efficacy across three Malaysian private universities. Grounded in Bandura's Self-Efficacy Theory and the Unified Theory of Acceptance and Use of Technology (UTAUT), a quantitative correlational design was employed with data collected from 297 students. Results revealed that both ChatGPT use and UTAUT constructs significantly predicted academic self-efficacy, explaining 39.5% of the variance ($R^2 = .395$, $F(5, 291) = 37.99$, $p < .001$). Performance expectancy ($\beta = .291$, $p < .001$) and facilitating conditions ($\beta = .236$, $p < .001$) were the strongest predictors. These findings suggest that frequent, ethical use supported by institutional facilitation enhances academic confidence. This study contributes one of the first empirical insights linking AI adoption constructs to self-efficacy outcomes in Malaysian higher education, offering practical implications for AI-integrated learning design. It also aligns with Malaysia's AI governance framework and SDGs 4, 9, and 10, emphasizing quality, innovation, and equity in education.

1. Introduction

The rapid emergence of generative artificial intelligence (AI) tools such as ChatGPT has sparked intense debate across higher education worldwide [1]. While these tools promise efficiency, Carlos [2] thought that personalization, and enhanced learning support, they also raise concerns regarding overreliance, academic integrity, and their broader implications for student capability development. In Malaysia, where private higher education institutions play an increasingly critical role in expanding access and diversifying learning environments, understanding how students integrate ChatGPT into their academic practices is especially timely [3].

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This study investigates the relationship between ChatGPT usage and academic self-efficacy among undergraduates in three Malaysian private universities, drawing upon Bandura's (1997) Self-Efficacy Theory [4] and Unified Theory of Acceptance and Use of Technology (UTAUT) [5]. Academic self-efficacy, as defined by Rothinam *et al.,* [6] as students' confidence in their ability to organize and execute academic tasks successfully, is a central predictor of learning outcomes, persistence, and achievement. With ChatGPT increasingly embedded in students' academic routines, ranging from generating essay outlines to revising written work, it is vital to determine whether its usage reinforces or undermines students' belief in their academic capabilities [7].

The problem addressed in this study stems from two intertwined challenges. First, while generative AI tools are rapidly adopted, empirical evidence on their impact on student learning processes, especially self-efficacy, remains limited. Some global studies warn of cognitive offloading and reduce critical thinking when students overly depend on AI tools as emphasized by Zhai *et al.,* [8], and while others highlight their potential to enhance mastery and confidence when used thoughtfully [9,10]. Second, in Malaysia's higher-education landscape, research remains skewed toward technology adoption and e-learning systems, with relatively few empirical studies linking generative AI use to psychological constructs such as self-efficacy [11]. Without such insights, educators and policymakers' risk either underutilizing AI's pedagogical benefits or overlooking its possible risks to student development as highlighted by Ayala [12].

1.1 Theoretical Foundations: Self-Efficacy and UTAUT

Bandura's Self-Efficacy Theory remains central to understanding how learners build confidence in their academic capabilities [13]. Self-efficacy develops through four sources: mastery experiences, vicarious learning, social persuasion, and emotional regulation [14]. In the context of AI, as noted by Lo [15] mastery can occur when students successfully use ChatGPT to clarify concepts or improve assignments, while vicarious learning emerges from observing peers who use AI effectively. Social persuasion may come from lecturers endorsing responsible AI use, and reduced anxiety can result from ChatGPT offering immediate feedback [16]. Together, these mechanisms highlight how AI tools can act as scaffolds for self-belief.

The Unified Theory of Acceptance and Use of Technology (UTAUT) complement this psychological perspective by explaining how perceptions shape technology adoption [17]. Performance expectancy (perceived usefulness), effort expectancy (ease of use), social influence, and facilitating conditions are key determinants of technology acceptance [18]. Applied to ChatGPT, these constructs capture not only whether students believe the tool improves their academic work but also whether peers encourage its use and whether institutions provide adequate support. Prior research demonstrates that these perceptions strongly predict behavioral intentions and, indirectly, learning outcomes [19].

By integrating Self-Efficacy Theory and UTAUT, this study advances a dual-lens approach: behavioral engagement, captured by frequency of ChatGPT use, and perceptual orientation, represented by UTAUT-based attitudes, jointly influence academic self-efficacy. This conceptual framework extends UTAUT beyond adoption intentions to examine psychological outcomes, while situating self-efficacy within technologically mediated learning environments.

2. Methodology

2.1 Research Design

This study employed a quantitative, descriptive, and correlational design to examine the relationships between ChatGPT usage, UTAUT-based attitudes, and academic self-efficacy. The

design was appropriate as it allowed the measurement of associations between quantifiable variables without manipulating them, aligning with the exploratory nature of research on emerging educational technologies.

2.2 Participants and Sampling

The study involved 297 undergraduate and postgraduate students from three Malaysian private universities: Han Chiang University College of Communication, INTI International College Penang, and Tunku Abdul Rahman University of Management and Technology (Penang Branch). Stratified random sample ensured proportional representation across institutions and study levels. The sample size was determined using the Krejcie and Morgan [20] table, providing sufficient power for correlation and regression analyses.

2.3 Instrumentation

Data was collected through a structured questionnaire with four sections. Section A gathered demographic information. Section B measured ChatGPT usage patterns for academic purposes, adapted from prior studies [8,21]. Section C assessed UTAUT constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) using items adapted from Venkatesh *et al.*, [22]. Section D measured academic self-efficacy using Chemers *et al.,* [23] validated scale. Responses were captured on five-point Likert scales ranging from strongly disagree (1) to strongly agree (5).

2.4 Reliability and Pilot Testing

A pilot study with 30 students confirmed the instrument's clarity and reliability. Cronbach's alpha values exceeded 0.80 for all constructs, indicating high internal consistency (Nunnally & Bernstein, 1994). Specifically, ChatGPT usage ($\alpha = 0.880$), UTAUT-based attitudes ($\alpha = 0.859$), and academic self-efficacy ($\alpha = 0.829$) demonstrated strong reliability.

2.5 Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics summarized demographic characteristics and variable distributions. Pearson's correlation assessed bivariate relationships among ChatGPT usage, UTAUT-based attitudes, and academic self-efficacy. Multiple regression was conducted to examine the combined and relative predictive power of usage and attitudes on self-efficacy.

3. Findings

3.1 Descriptive Statistics

The demographic distribution is shown in Table 1. The sample was gender-balanced, with 50.5% female and 49.5% male. Bachelor's degree students comprised the largest group (36.0%), followed by diploma (35.4%), master's (16.5%), PhD (6.7%), and foundation (5.4%). Academic disciplines were diverse, with the largest representation of Art and Design (21.9%) and Business (20.2%). Across all institutions, students reported moderate-to-high ChatGPT usage ($M = 3.54$, $SD = 0.85$). UTAUT constructs showed generally favorable perceptions: performance expectancy ($M = 3.72$), effort

expectancy (M = 3.81), social influence (M = 3.45), and facilitating conditions (M = 3.68). Academic self-efficacy was also high (M = 3.77, SD = 0.73).

3.2 Correlation Analysis

Pearson's correlation analysis indicated strong and positive relationships between the three constructs. Frequency of ChatGPT use correlated significantly with UTAUT-based attitudes ($r = .839$, $p < .001$) and academic self-efficacy ($r = .837$, $p < .001$). UTAUT-based attitudes were even more strongly correlated with academic self-efficacy ($r = .895$, $p < .001$). Table 1 shows the correlation between the frequency of ChatGPT use with UTAUT-based attitudes towards ChatGPT and academic self-efficacy.

Table 1
Correlation matrix of key variables (N = 297)

Variable	1	2	3
1. Frequency of ChatGPT Use	1	.839**	.837**
2. UTAUT-Based Attitudes Toward ChatGPT	.839**	1	.895**
3. Academic Self-Efficacy	.837**	.895**	1

Note. p < .01 (2-tailed).

3.3 Regression Analysis

Multiple regression analysis confirmed that both frequency of use and attitudes significantly predicted academic self-efficacy. The overall model was robust, $F (2, 294) = 698.315$, $p < .001$, with $R^2 = .826$, indicating that 82.6% of the variance in self-efficacy was explained. Attitudes ($\beta = .649$, $p < .001$) were stronger predictors than frequency of use ($\beta = .293$, $p < .001$). These results highlight that while using ChatGPT more frequently is associated with higher academic self-confidence, students' perceptions of its usefulness, ease of use, social support, and institutional facilitation are even more influential, as shown in Figure 1.

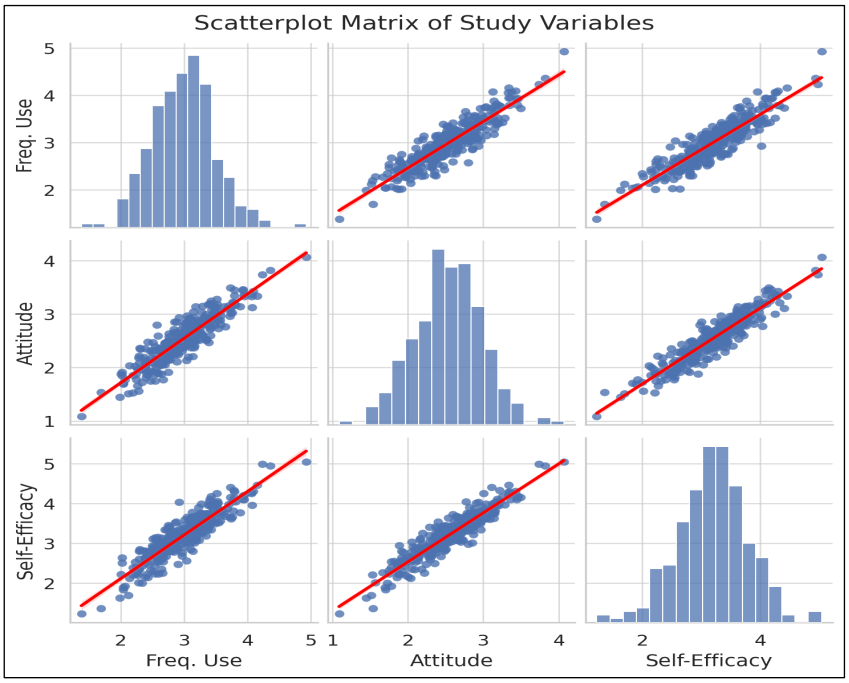

Fig. 1. Scatterplot matrix of study variables

4. Discussion

This study examined the relationship between ChatGPT usage, UTAUT-based attitudes, and academic self-efficacy among students in Malaysian private universities. Guided by Bandura's Self-Efficacy Theory and the Unified Theory of Acceptance and Use of Technology (UTAUT), the findings demonstrate that both the frequency of ChatGPT use and students' attitudes toward the tool are significant predictors of academic self-efficacy. Importantly, attitudes exert a stronger influence, underscoring the critical role of perceptions in shaping confidence.

4.1 Frequency of ChatGPT Use and Self-Efficacy

The results indicate that students who reported more frequent use of ChatGPT also exhibited higher levels of academic self-efficacy. This supports Bandura's assertion that mastery experiences are central to developing self-belief. Regular use of ChatGPT may provide micro-successes, such as generating outlines, clarifying concepts, or improving written work, which over time accumulate into stronger confidence in academic abilities. Similar findings were reported by Vieriu *et al*., [24] who noted that structured use of AI tools supported confidence in academic problem-solving. However, international studies caution that overreliance may lead to cognitive offloading and diminished metacognition [25]. In this study, the positive relationship may be explained by the structured support and AI literacy emphasis in Malaysian private universities, which promote responsible integration rather than unchecked dependence.

4.2 UTAUT-Based Attitudes as Stronger Predictors

The study found that UTAUT-based attitudes toward ChatGPT were stronger predictors of self-efficacy than usage frequency. When students perceived ChatGPT as useful, easy to use, socially endorsed, and institutionally supported, their confidence in academic capabilities was significantly higher. This aligns with [22] framework, where behavioral intention and adoption are driven by positive perceptions. Performance expectancy and effort expectancy emerged as especially influential. Students who viewed ChatGPT as a helpful, low-effort tool were more confident in their ability to succeed academically. This result echoes findings [26] and [27], who emphasized the importance of perceived usefulness and ease of use in fostering technology-related confidence.

Social influence and facilitating conditions also played meaningful roles. In collectivist contexts such as Malaysia, peer and lecturer endorsement increases legitimacy, while institutional support creates an enabling environment. Prior research confirms that clear guidelines, workshops, and infrastructure improve both adoption and confidence [28,29]. These contextual factors highlight the importance of embedding AI literacy into curricula and institutional policies.

4.3 Comparative Insights with Global Research

The findings contrast with some international studies suggesting that AI overuse diminishes self-efficacy [30,31]. Instead, they reinforce results from regional research in Southeast Asia [32,27], showing that structured and purposeful AI integration enhances academic confidence. This difference may be attributed to Malaysia's emerging AI governance frameworks, such as the National AI Governance and Ethics Guidelines [33], which promote responsible use. The findings also extend UTAUT by demonstrating that attitudes toward technology not only predict adoption but also directly influence psychological outcomes such as self-efficacy.

4.4 Implications for Practice and Policy

For higher education practice, the results indicate that institutions should focus not only on facilitating AI use but also on cultivating positive attitudes through AI literacy, ethical training, and embedded pedagogical practices. Lecturers can scaffold ChatGPT in ways that enhance performance expectancy, such as brainstorming or clarifying tasks, while maintaining student responsibility for deeper learning.

At the policy level, universities must develop clear institutional guidelines that align with Malaysia's AI governance frameworks. Such policies should legitimize responsible use, reduce uncertainty, and empower students to use AI confidently without fear of misconduct accusations. This approach aligns with the Malaysia Education Blueprint (2015–2025), which emphasizes technology-enabled, student-centered learning [34].

For pedagogy, intentional integration of ChatGPT into teaching practices can enhance student engagement and confidence. Peer-led AI learning groups, guided role-play exercises, and critical evaluation of AI outputs can combine efficiency with critical thinking, addressing concerns about overreliance.

For students, the study highlights the importance of cultivating responsible attitudes toward ChatGPT use. Confidence is shaped not only by frequent use but by meaningful, ethical, and self-regulated application of AI tools. Excessive reliance, however, risks undermining deep learning [35]. Thus, students should be encouraged to treat AI as scaffolding rather than a substitute for independent effort.

6. Conclusion

This study confirmed that both the frequency of ChatGPT use and UTAUT-based attitudes significantly predict students' academic self-efficacy in Malaysian private universities, with attitudes exerting the stronger influence. The high explanatory power ($R^2 = .826$) underscores that perceptions of usefulness, ease of use, social endorsement, and institutional support collectively shape confidence in academic capability.

Theoretically, the study extends UTAUT beyond technology adoption to psychological outcomes and contextualizes Bandura's Self-Efficacy Theory within AI-assisted learning environments. Practically, the findings suggest that universities should embed AI literacy, ethical-use training, and supportive policies into curricula to ensure that AI tools function as scaffolds for confidence and competence rather than substitutes for effort.

The policy implications point toward alignment with Malaysia's AI Governance and Ethics Guidelines and the Education Blueprint (2015–2025). The evidence indicates that restrictive or prohibitive approaches to AI use may be counterproductive; instead, integration strategies emphasizing ethical, purposeful, and guided use are recommended.

Future research should adopt longitudinal or experimental designs and include comparative studies across public and private institutions to strengthen causal inference and generalizability. Broader investigations into task-specific AI use and self-regulation will further clarify how digital tools influence academic confidence. Overall, responsible AI integration represents a promising path toward inclusive, innovative, and self-efficacious learning, advancing the aims of SDGs 4, 9, and 10 in higher education [36].

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