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Technology Acceptance and Its Impact on Student Dependency in Assignment Completion at Politeknik Kota Bharu

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ABSTRACT

This study aims to assess the impact of perceived ease of use, perceived usefulness, and use of artificial intelligence (AI) tools on students' reliance in completing academic assignments among diploma students at Malaysian Polytechnics. Based on the Technology Acceptance Model (TAM) by Davis (1989), this study examines the extent to which students accept and use AI tools such as ChatGPT, Grammarly, and QuillBot in the context of daily learning. This study uses a quantitative approach with an online questionnaire distributed to polytechnic students, and the data is analysed using descriptive statistics and regression analysis to identify the relationship between variables. The findings show that perceptions of ease of use and usefulness of AI have a significant relationship with the level of students' use and reliance. Over-reliance is detected when students use AI not only as a learning aid, but also as a shortcut in completing assignments, thus affecting critical thinking and academic autonomy. This study concludes that although AI benefits students in terms of understanding and productivity, the level of reliance needs to be monitored ethically and systematically. Therefore, the study recommends that higher education institutions develop clear AI usage policies, increase ethical awareness among students, and include AI literacy in the curriculum as an effort to balance effective technology use and self-directed learning.

1.0 Introduction

The escalating access to and employment of AI tools by students in higher education has revolutionized assignment completion. While AI tools offer benefits such as increased efficiency and academic performance, there are growing concerns that students may become overly dependent on these technologies. Such dependence can undermine their learning process, critical thinking, and academic integrity. In various aspects of daily life, AI tools are increasingly integrated with the potential to improve efficiency, productivity, and decision-making across a variety of applications. AI tools are software solutions that apply artificial intelligence to accomplish activities generally performed by humans. The rapid emergence of AI as a

revolutionary technology has transformed many aspects of our life (Lund & Wang, 2023). In the academic context, AI tools can cater to the needs of learners and provide real-time feedback and provide an engaging learning environment. Students can receive immediate and detailed feedback through AI applications including feedback on their assignments and helping them see their strengths and weaknesses. This can improve understanding and learning outcomes, as well as helping lecturers to focus on areas that need attention in future teaching.

In both general and tertiary education, Artificial Intelligence (AI) significantly impacts students' learning advancement by introducing both advantages and drawbacks (Edtech, 2020). The use of AI in the educational field has revolutionized the learning experience, bringing forth both benefits and obstacles for student development. Through content customization based on individual student needs, AI supports adaptive and personalized learning (Hennekeuser et al., 2024). AI-based tools have become integral to modern life, influencing essential cognitive functions such as concentration, memory retention, and analytical thinking. While AI integration into everyday academic routines provides developmental opportunities, it also introduces certain limitations for cognitive advancement. Nonetheless, the incorporation of AI into education comes with its own set of issues. Gaining a thorough understanding of AI's impact in educational settings is crucial, as it involves not just technological elements but also pedagogical considerations. Tertiary institutions must establish clear guidelines regarding the purpose and extent of AI application in student learning (Holmes & Tuomi, 2022).

1.1 Research Objectives

i. To examine the perceived ease of use of AI tools among diploma students.

ii. To assess the perceived usefulness of AI tools for academic assignments.

iii. To identify the level of AI tool usage among diploma students.

iv. To determine the relationship between perceived ease of use, perceived usefulness, AI tool usage, and student dependency in assignment completion.

2.0 Literature review

Perceived Ease of Use (PEOU) is widely acknowledged as a key determinant in the adoption of technology within the educational landscape. Research conducted by Elfeky and Elbyaly (2023) indicated that PEOU plays a vital role in shaping students' perceptions and their willingness to engage with learning management platforms. In a similar vein, Barrett et al. (2023) highlighted that users may resist adopting new technologies if they find them overly complicated. Moreover, a study by Siti Norbaya et al. (2023) established that, among the constructs According to the Technology Acceptance Model (TAM), PEOU demonstrated the most substantial effect on users' acceptance of AI chatbot tools. In the present landscape of AI advancement, ChatGPT has risen in popularity as a common educational resource among students in higher learning institutions. Lam and Salmiza (2025) reported that polytechnic students in Malaysia rely on ChatGPT not just for completing coursework, but also as a "digital tutor" that assists in comprehending complex academic content.

Perceived Usefulness (PU) also plays an important role in technology acceptance. According to Albayati (2024), students are more inclined to utilize AI when they believe it can improve the quality of their writing and offer immediate feedback. A cross-cultural study by Akram et al. (2021) found that PU predicted students' behavioral intentions to use AI, consistent with the TAM framework. Research conducted by Dwivedi et al. (2023) indicated that the perceived usefulness (PU) of ChatGPT was significantly high, particularly in areas such as essay writing, text comprehension, and academic information retrieval. However, many students admitted that they became overly dependent on ChatGPT, as raised by previous studies (Noral Hidayah & Bibi Nabi, 2024). This indicates that ChatGPT is not only convenient and useful, yet it is equally important

in determining the extent to which students depend on this technology in everyday academic tasks.

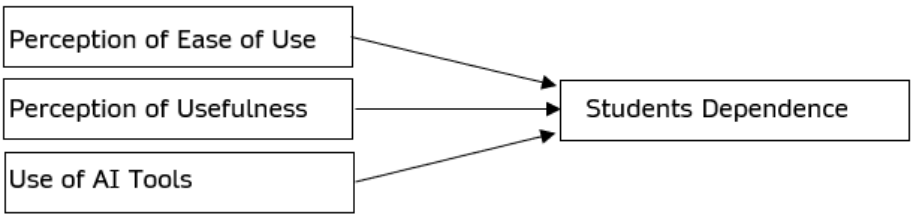

Figure 1: Theoretical Framework

Figure 1 illustrates the Technology Acceptance Model (TAM), introduced by Davis (1989), which offers a foundational approach to understanding how individuals adopt and utilize technology. The model suggests that Perceived Usefulness (PU) defined as the degree to which a person believes that using a specific technology will enhance their performance and Perceived Ease of Use (PEOU) the belief that the technology can be used with minimal effort are two central factors that shape users' behavioural intentions and actual usage of a system (Davis, 1989; Venkatesh & Davis, 2000). PU represents the extent to which learners think that AI-based tools can enhance their academic outcomes or help them complete tasks more efficiently. When students view AI technologies as beneficial, they are more inclined to adopt them consistently. On the other hand, PEOU relates to how simple and user-friendly students perceive these tools to be. Platforms that are intuitive and easy to navigate tend to gain higher acceptance and frequent usage. According to the TAM framework, if students view AI tools as both useful and easy to manage, they intense to use them continuously, which could eventually lead to habitual or even excessive reliance. In the educational setting, learners are more open to using AI tools like ChatGPT, Grammarly, and QuillBot when these tools are seen as effective in boosting academic performance and are straightforward to use (Dwivedi et al., 2023). Due to its effectiveness in explaining user behaviour across different technological environments, the Technology Acceptance Model has been frequently employed in studies related to education, particularly in areas like online learning platforms, digital classrooms, and intelligent tutoring systems (Mailizar & Fan, 2021).

This study extends TAM by assessing the correlation between students' perspectives on AI tools and the resulting level of academic dependence. When students often utilize AI tools because of their perceived convenience and effectiveness, this habitual usage could lead to dependency, a condition where students significantly depend on these resources for finishing tasks, which may reduce their independent thought and academic effort (Noral Hidayah & Bibi Nabi, 2024; Lam & Salmiza, 2025). While TAM traditionally focuses on acceptance and use, this study explores the impact of behaviour that goes beyond mere acceptance, namely habitual overuse. This shift is particularly relevant in the AI era, where tools are not just helpful, but also capable of automatically generating content. By applying TAM, this study investigates how positive perceptions (PU and PEOU) toward AI tools among Polytechnics students influence usage frequency, and how that usage may lead to academic dependency.

Artificial Intelligence (AI) function as intelligent digital assistants, capable of processing data, interpreting human language, and recognizing visual objects. Such technologies support individuals in making informed decisions, increasing productivity, and addressing challenges more efficiently. In the field of education, Artificial intelligence tools have proven valuable for facilitating digital instruction and learning, automating repetitive academic tasks for educators, and tailoring educational experiences based on individual student needs (Seo et al., 2021). Students in advanced educational stages engage with more sophisticated academic tasks, and the present generation tends to recognize the value of social media and digital technologies in the learning process (Nurul Dafiqah et al.,2024). Kumar (2023) highlighted that AI-based

technologies can be designed to cater to students' academic demands, particularly in fostering how they learn and enhancing their lifelong learning competencies.

The adoption of artificial intelligence in education can sometimes lead to misuse or excessive reliance, potentially undermining the quality and effectiveness of learning outcomes. When students become overly reliant on such technologies, it may hinder their active engagement and reduce their capacity for independent thinking and creativity, as the AI completes tasks on their behalf. Additionally, when AI produces student assignments, educators may struggle to accurately evaluate students' true understanding, thereby compromising the integrity of assessments. Koos and Wachsmann (2023) point out that the growing use of AI-generated content introduces ethical dilemmas, including risks of academic dishonesty, diminished critical thinking abilities, and a reduction in originality in scholarly writing. The integration of AI into education also raises ethical considerations, such as safeguarding personal autonomy, protecting user privacy, fostering trust, and upholding responsibility (Adıgüzel, Kaya, & Cansu, 2023). Addressing these challenges requires enhancing plagiarism detection systems, promoting responsible AI usage, incorporating AI ethics into academic syllabi, and establishing clear policies and frameworks to regulate AI practices within educational institutions. A study by Panagopoulou-Koutnatzi et al. (2023) revealed that the emergence of ChatGPT has sparked legal and ethical debates in the academic domain, highlighting the urgent need to understand both its benefits and associated risks.

3.0 Methodology

Perceived Ease of Use (PEOU) has been identified as a key factor in technology acceptance in education. A study by Elfeky and Elbyaly (2023) showed that PEOU significantly affects students' attitudes and intentions to use learning management systems. Barrett et al. (2023) also highlighted that perceived technological barriers can hinder user acceptance of new technologies. In this study, the researcher aimed to obtain a sample size of 50 respondents who successfully answered the questionnaire. The population in this study consists of Diploma Student from Department of Commerce, Kota Bharu Polytechnic, consisting of 694 students. The elements for this study were selected from Department of Commerce students consisting of students in semesters 1-5 from Diploma in Accountancy, Insurance, Marketing and Business Studies programs. Several sampling statistics were used. Krejcie and Morgan (1970) once issued a table of acceptable sample sizes for small populations. In this research, data was collected via Google Form where the link was sent to the students involved. Therefore, the students were randomly selected without inclusion criteria. The main goal of using Google Form is to facilitate data collection and analysis. Furthermore, students can answer the questionnaire wherever they are and at any time. So, all information will be collected from each respondent, and the unit of analysis is the individual.

4.0 Discussion of analysis and findings

SPSS software was used to analyze the data, and descriptive techniques such as frequency analysis were applied to assess the respondent characteristics.

As shown in Table 1, a total of 56 participants engaged in the study, most of whom were female (73.2%) and most aged between 21 to 23 years (51%). More than half of the respondents were Diploma in Marketing students (55.4%), followed by Diploma in Accountancy (25%), Business Studies (17.9%), and Insurance (1.8%). In terms of semester, most were in Semester 3 (46.4%), while none were from Semester 1. Regarding AI tool usage, the majority reported frequent use, with 41.1% using AI tools often and 16.1% always, indicating a high engagement with AI in their academic activities.

Table 1: Demographic Information of Respondents (n=56)

Respondent	Frequency	Percentage (%)
Gender		
Male	15	26.8
Female	41	73.2
Age		
Below 18	0	0.0
18 -20	40	40.0
21 - 23	51	51.0
24 and above	6	6.0
Highest Level of Education		
Diploma in Accountancy	14	25.0
Diploma Insurance	1	1.8
Diploma in Business Studies	10	17.9
Diploma in Marketing	31	55.4
Semester		
Semester 1	0	0.0
Semester 2	10	17.9
Semester 3	26	46.4
Semester 4	6	10.7
Semester 5	14	25.0
Semester 6	0	0.0
Often Use AI Tools		
Never	0	0.0
Rarely	3	5.4
Sometimes	21	37.5
Often	23	41.1
Always	9	16.1

Descriptive statistics were applied to evaluate diploma students' perceptions and behaviours regarding AI tools. Table 2 shows data on the mean and standard deviation for the entire variable construct.

Table 2: Summary of Descriptive Statistics for Study Constructs

Construct	No. of Items	Mean	Std. Deviation	Interpretation
Perceived Ease of Use	5	3.83	0.80	High
Perceived Usefulness	5	3.89	0.83	High
AI Tool Usage	5	3.51	1.02	Moderate
Student Dependency on AI Tools	5	2.96	0.99	Low to Moderate

Students generally reported positive perceptions toward AI tools in terms of ease of use and usefulness. AI tool usage was moderate, with frequent use for grammar and paraphrasing. However, students' dependency remained relatively low, suggesting that while AI tools are used, they are not overly relied upon. These findings support the readiness of students to integrate AI tools as part of their academic practices without excessive dependence.

The analysis results, as presented in Table 3, demonstrate strong reliability for all constructs, with Cronbach's Alpha values ranging from 0.888 to 0.932. Among them, the students' dependency scale showed the highest internal consistency ($\alpha = 0.932$), followed by perceived usefulness (PU) at $\alpha = 0.916$, perceived ease of use (PEOU) at $\alpha = 0.910$, and AI tools at $\alpha = 0.888$. All values surpass the commonly accepted threshold of 0.70, confirming that the measurement scales employed are highly reliable.

Table 3: Reliability Statistics (Cronbach's Alpha)

Construct	Cronbach's Alpha	No. of Items	Reliability Level
PEOU	0.910	5	Excellent
PU	0.916	5	Excellent
AI Tools	0.888	5	Good
Student Dependency	0.932	5	Excellent

A Pearson correlation analysis was conducted to examine the relationships among Perceived Ease of Use (PEOU), Perceived Usefulness (PU), perceptions of AI tools (Tool), and Student Dependency. The results showed a strong and positive correlation between PEOU and PU ($r = .733$, $p < .001$), suggesting that students who perceive AI tools as user-friendly are also more inclined to view them as valuable. Furthermore, PEOU exhibited a moderate association with Tool ($r = .588$, $p < .001$), and a weak yet statistically meaningful relationship with Dependency ($r = .266$, $p = .047$).

PU was also found to have a strong positive correlation with Tool ($r = .623$, $p < .001$), and a weak to moderate correlation with Dependency ($r = .285$, $p = .033$), indicating that students who find AI tools useful are slightly more likely to depend on them. The Tool variable demonstrated a strong and significant correlation with Dependency ($r = .625$, $p < .001$), suggesting that positive perceptions of AI tools are closely linked to higher levels of student dependency.

Table 4: Correlations

		PEOU	PU	Tool	Dependency
PEOU	Pearson Correlation	1	.733**	.588**	.266*
	Sig. (2-tailed)		.000	.000	.047
	N	56	56	56	56
PU	Pearson Correlation	.733**	1	.623**	.285*
	Sig. (2-tailed)	.000		.000	.033
	N	56	56	56	56
Tool	Pearson Correlation	.588**	.623**	1	.625**
	Sig. (2-tailed)	.000	.000		.000
	N	56	56	56	56
Dependency	Pearson Correlation	.266*	.285*	.625**	1
	Sig. (2-tailed)	.047	.033	.000	
	N	56	56	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Overall, all relationships obtained were positive and statistically significant, thus supporting the proposed relationship between ease of use, perceived usefulness, perceptions of the tool, and the level of students' reliance in the context of AI tool use. Standard multiple linear regression analysis was conducted to identify the extent to which perceptions of PEOU, PU, and AI tools could predict student reliance on the use of the tools. A summary of the model fit is shown in Table 5.

The model was statistically significant, $F (3, 52) = 12.172$, $p < .001$, and explained approximately 41.3% of the variance in student dependency (Adjusted $R^2 = .379$). This indicates a moderately strong relationship between the predictor variables and dependency. Among the three predictors, only Tool perception was found to be a significant predictor of student dependency ($\beta = .751$, $t = 5.358$, $p < .001$). This suggests that students who have more positive perceptions of AI tools are significantly more likely to depend on them. In contrast, PEOU ($p = .579$) and PU ($p = .486$) were not statistically significant, indicating that ease of use and perceived

usefulness alone do not significantly influence dependency when considered alongside tool perception.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.642[a]	.413	.379	.69238

a. Predictors: (Constant), Tool, PEOU, PU

Table 6: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.505	3	5.835	12.172	.000[b]
	Residual	24.928	52	.479		
	Total	42.434	55			

a. Dependent Variable: Dependency

b. Predictors: (Constant), Tool, PEOU, PU

Table 7: Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.238	.558		2.219	.031
	PEOU	-.114	.205	-.090	-.558	.579
	PU	-.143	.204	-.117	-.702	.486
	Tool	.774	.144	.751	5.358	.000

a. Dependent Variable: Dependency

The findings highlight the central role of tool perception in influencing student dependency on AI tools. Despite the positive correlations observed between PEOU, PU, and dependency, these variables were not significant predictors in the regression model. This means that although students often regard AI tools as simple to use and helpful, these perceptions do not directly drive dependency unless the tools themselves are perceived as reliable, effective, and beneficial.

These results are consistent with past studies that emphasize user experience and tool effectiveness as key determinants of technology adoption and usage behaviour (e.g., Davis, 1989; Venkatesh & Bala, 2008). It also aligns with the Technology Acceptance Model (TAM), which positions perceived usefulness and ease of use as antecedents, but not necessarily direct predictors of behavioural outcomes like dependency. In practical terms, educational institutions and AI tool developers should focus on enhancing the perceived value and performance of AI tools rather than solely improving usability. If students view the tools as integral to their learning and problem-solving, their engagement and dependency are likely to increase, regardless of minor usability issues.

5.0 Conclusion and Future Research

In conclusion, this research investigates the impact of technology acceptance variables namely perceived ease of use, perceived usefulness, and the utilization of AI tools on students' dependency in completing academic tasks among diploma students at Kota Bharu Polytechnic. Grounded in the Technology Acceptance Model (TAM), the findings indicate that while students generally view AI tools as user-friendly and beneficial, it is the actual engagement with these tools that significantly determines their level of dependency on technology for assignment completion.

Descriptive outcomes highlighted heightened perceptions of both ease of use and usefulness of AI tools, along with a moderate degree of utilization among students. Nonetheless, the extent of students' dependency on AI tools was comparatively low, indicating that while students employed AI to support their academic tasks, they were not entirely reliant on the technology. The regression analysis reinforced this observation by demonstrating that only the actual use of AI tools significantly influenced students' dependency. In contrast, perceived ease

of use and usefulness, although positively associated, did not exhibit a notable effect when compared to actual behavioural usage.

These outcomes suggest that students' interaction with AI tools is shaped more by hands-on application than by subjective perception. Consequently, academic institutions should not only promote technological adoption but also cultivate mindful and ethical usage practices to preserve critical thinking skills and academic honesty. Future research is encouraged to incorporate qualitative approaches such as interviews or focus group discussions to uncover the reasons behind students' reliance on AI and how they ethically rationalize their usage. Further investigation could also examine the influence of AI use on academic achievement and ethical reasoning to better align technological integration with educational objectives.

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Author Contributions

Ghazali N.: Conceptualization, Problem Statement, Literature Review, Data Collection, Supervision, Writing - Original Draft Preparation; **Muhd Ariff S. H.:** Statistical Analysis, Data Curation, Methodology Design, Writing; **Muhidin S. A.**:- Review and Editing, Validation.

Conflicts of Interest

The manuscript has not been published elsewhere and is not being considered by other journals. All authors have approved the review, agree with its Submission and declare no conflict of interest in the manuscript.

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