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READY OR NOT? EXPLORING AI ADOPTION AMONG LECTURERS IN MALAYSIAN POLYTECHNICS AND COMMUNITY COLLEGES

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ABSTRACT

This study used a quantitative survey to explore the awareness perception, and readiness of 134 lecturers at Malaysian Polytechnics and Community Colleges (POLYCC) to adopt Artificial Intelligence (AI) tools in teaching and learning. Lecturers from different disciplinary backgrounds (STEM, ICT and Others) were surveyed to see if their field of study influenced their engagement with AI. The research found that while there were no overall significant differences, a notable trend emerged from post-hoc analysis. ICT lecturers demonstrated a marginally higher level of AI awareness and AI adoption readiness compared to their peers in non-technical disciplines. This suggests a potential digital divide, where a lecturer's familiarity with technology correlates with their confidence and preparedness to integrate AI. However, a unifying finding was that lecturers across all disciplines shared similar perceptions of the benefits and challenges of AI in education, indicating a common understanding of its role. The results highlight the need for targeted professional development initiatives to bridge the readiness gap and build the skills and confidence of educators in non-technical fields. This is crucial for ensuring a balanced and inclusive integration of educational technology as part of a broader educational policy to modernize higher education in Malaysia. This study offers timely insights for policymakers and educational leaders aiming to support responsible and effective AI adoption in higher education, ensuring that teaching staff are well-equipped to navigate the evolving digital landscape.

1. Introduction

Artificial Intelligence or AI is rapidly transforming social, economy, politics and education systems across the globe. AI-based technologies have reported to improve human life quality, making life easier, safer and more productive (Ali et al., 2023). AI is currently viewed by many as a driver that is integral to the fourth industrial revolution, and it may trigger the fourth revolution in education (Zhai et al., 2021). AI offering new tools and opportunities to enhance

teaching and learning, and AI also changing a common practice in education such as from manually marking the students' assessment to automated grading systems, and personalized learning platforms and intelligent tutoring systems. Computer-assisted assessments or automated grading systems are becoming more popular in higher education institutions because they can significantly enhance the learning process (Conole and Warburton, 2005). Hence nowadays AI technologies are being increasingly adopted to improve educational outcomes and administrative efficiency.

In Malaysia, the push toward digital transformation in education has gained momentum through national initiatives such as the Malaysia Education Blueprint and the National Artificial Intelligence Roadmap. However, while much attention has been given to AI integration in universities and schools, less is known about how lecturers in polytechnics and community colleges are adapting to this technological shift. The role of educators in this AI-driven transformation is crucial, and strategic initiatives must support their understanding and readiness to effectively integrate AI technologies (Saman et al., 2024). Malaysia can establish itself as a leader in AI-driven education by proactively addressing these complexities (Saman et al., 2024).

Thus lecturers at higher education institutions play a crucial role in preparing students for practical, industry-relevant careers-making their engagement with AI particularly significant. According to Mulaudzi and Hamilton (2024), their studies showed that a lecturer views range from initial scepticism and negativity to cautious optimism and recognition of AI's potential, reflecting a transitional journey in adapting to this technological innovation. The extent to which they adopt and implement AI tools in their teaching practices remains underexplored. Challenges such as limited training, infrastructure constraints, and varying levels of digital literacy may influence adoption rates and attitudes toward AI. Understanding these dynamics is essential for bridging the gap between technological potential and practical implementation.

This research aims to explore the current state of AI adoption among lecturers in Malaysian polytechnics and community colleges. It seeks to identify the factors influencing adoption, the challenges faced, and the perceptions of educators toward AI integration. By doing so, this study hopes to inform policy development and support systems that can facilitate more effective and widespread use of AI in technical and vocational education contexts.

2. Literature Review

In the evolving landscape of education, the integration of AI represents a transformative shift, stipulating a new era in learning and teaching methodologies (Walter, 2024). Studies have demonstrated that if users think a new technology is useful and easy to handle, its adoption is more likely (Granic & Marangunic, 2019). The integration of AI into educational environments has garnered increasing attention in recent years. As AI technologies become more accessible, their potential to transform teaching and learning is being actively explored by educators and policymakers alike. This literature review outlines the key themes surrounding AI adoption in education, with particular focus on lecturers' roles, influencing factors, and the Malaysian context.

AI applications in education encompass a wide range of tools, including intelligent tutoring systems, automated grading, learning analytics, virtual assistants, and adaptive learning platforms (Luckin et al., 2016). These tools offer personalized learning experiences, reduce administrative burdens for educators, and provide real-time feedback to students. However, their successful implementation depends on educators' willingness and ability to adopt them (Zawacki-Richter et al., 2019). Using AI technologies, students will have some opportunities to search for information with more flexibly, easily, quickly and also can provide new experiences. Hence students need to be guided by lecturers, so that students do not stray from the real learning objectives. Lecturers and students will also get the optimum benefits for both parties while using AI technologies.

Several models have been developed to explain technology adoption in education, with the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) being among the most widely used. According to Davis (1989), perceived usefulness and perceived ease of use are central to predicting acceptance of technology. Meanwhile, Venkatesh et al. (2003) expanded on this with UTAUT, introducing factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions.

Additional research highlights the role of digital competence, institutional support, training opportunities, and attitudes toward technology as critical enablers or barriers to AI adoption (Teo, 2011). There are also a few challenges to AI adoption such as resistance to change, lack of awareness, and concerns over data privacy and job.

Studies in higher education suggest varying levels of AI adoption across different contexts. In developed countries, universities are increasingly investing in AI-driven tools to support teaching, research, and administration. Lecturers play a pivotal role in the diffusion of AI in educational settings. Their beliefs, motivation, and pedagogical orientation significantly influence whether and how AI is integrated into the curriculum (Ertmer & Ottenbreit-Leftwich, 2010). Professional development programs that focus on both technical skills and pedagogical strategies for AI use have been shown to enhance adoption rates.

National Education Policies in Malaysia, such as the *Malaysia Education Blueprint (Higher Education)*, emphasize the importance of digital innovation, including AI, in enhancing educational outcomes. The Ministry of Higher Education has initiated efforts to integrate emerging technologies into polytechnics and community colleges, in order to align with the Industrial Revolution 4.0 (IR4.0) agenda.

Despite these policy directives, empirical studies on AI adoption at the lecturer level within Malaysian polytechnics and community colleges are limited. Some existing research tends to give more focus on general ICT integration, and also focused on digital literacy among academicians. As such, there is a pressing need to investigate the specific experiences, attitudes, and challenges faced by lecturers in adopting AI tools in these institutions.

The focus of this study was on the application of AI among lecturers in Malaysian Polytechnic and Community College, hence also give an impact on the Technical and Vocational Education and Training (TVET) institutions. Alias, AB. (2023) stated that the impact on the TVET

institution is evident through the increased use of technology in teaching and learning. TVET institutions need to consider the need to provide sufficient resources, training related to this application, and encourage responsible usage (Alias, AB. 2023).

In addition, the global literature provides valuable frameworks and insights into AI adoption in education, localized studies focusing on the POLYCC ecosystem are limited. This study seeks to fill this gap by exploring the extent of AI adoption, the influencing factors, and the specific challenges encountered by lecturers in these institutions.

3. Methodology

This study applied a quantitative survey research design to explore POLYCC lecturers' awareness, perception and readiness regarding the adoption of AI tools in teaching and learning. Measurable data collected from lecturers with multiple academic disciplines including Mathematics, Engineering, Business, Social Sciences, Information Technology and General Studies. A total of 134 respondents participated in the survey.

3.1 Subsection

The study tested the following hypotheses to determine whether disciplinary background influences lecturers' engagement with AI:

H_{01}: There is no significant difference in AI awareness among lecturers from different disciplinary backgrounds.

H_{11}: There is a significant difference in AI awareness among lecturers from different disciplinary backgrounds.

H_{02}: There is no significant difference in AI perception (benefits and challenges) among lecturers from different disciplinary backgrounds.

H_{12}: There is a significant difference in AI perception among lecturers from different disciplinary backgrounds.

H_{03}: There is no significant difference in AI adoption readiness among lecturers from different disciplinary backgrounds.

H_{13}: There is a significant difference in AI adoption readiness among lecturers from different disciplinary backgrounds.

3.2 Data Collection and Analysis

The survey was distributed electronically through email and academic networks. Descriptive statistics were used to summarize demographic data and overall trend. To test the hypotheses, a one-way ANOVA was performed to compare means across discipline background for three (3) key variables (awareness, perception and readiness). Post hoc tests were used to identify

specific discipline background differences at significance level of $p<0.1$ used for all hypothesis testing.

Respondents academic discipline background was group into three (3) categories:

a. STEM (Science, Technology, Engineering and Mathematics)
b. ICT (Information and Communication Technology)
c. Others (Business, General Studies, Humanities, Arts and Social Sciences)

4. Results

This study aimed to explore differences in AI awareness, perception, and adoption readiness among lecturers across different disciplinary backgrounds (STEM, ICT, and Others) in POLYCC.

Table 1: Distribution of Respondents by Disciplinary Background, Teaching Experience and Gender

Years of Experience			Disciplinary Background			Total
			Others	STEM	ICT	
1 – 3 years	Gender	Female	2	2	6	10
		Male	0	0	0	3
	Total		2	2	6	13
4 – 6 years	Gender	Female	4	0	5	9
		Male	0	1	2	3
	Total		4	1	7	12
7 – 9 years	Gender	Female	2	1	1	4
		Male	0	0	1	1
	Total		2	1	2	5
More than 10 years	Gender	Female	26	23	25	74
		Male	8	16	6	30
	Total		34	39	31	104
Total	Gender	Female	34	26	37	97
		Male	8	20	9	37
	Total		42	46	46	134

Table 1 described respondents' distribution by disciplinary background, teaching experience and gender. Across all three disciplinary areas, the majority of respondents (77.6%) had more than ten years of teaching experience. While female academics predominated in the 'Others' category, men lecturers were marginally more represented in ICT and STEM. Teaching experience may have a minimal confounding influence on awareness and preparation outcomes in our group, according to the demographic stability across experience levels.

Table 2: Post-hoc Comparison of AI Awareness, Perception, and Readiness Across Disciplinary Backgrounds

Dependent Variable	Disciplinary Background (A)	Disciplinary Background (B)	Mean Difference (A-B)	Sig. (p)
Awareness	Others	STEM	-0.12746	0.142
		ICT	-0.16822*	0.053
	STEM	Others	0.12746	0.142
		ICT	-0.04076	0.629
	ICT	Others	0.16822*	0.053
		STEM	0.04076	0.629
Perceptions	Others	STEM	-0.01380	0.849
		ICT	0.03934	0.588
	STEM	Others	0.01380	0.849
		ICT	0.05314	0.454
	ICT	Others	-0.03934	0.588
		STEM	-0.05314	0.454
Readiness	Others	STEM	-0.05487	0.564
		ICT	-0.16791*	0.079
	STEM	Others	0.05487	0.564
		ICT	-0.11304	0.225
	ICT	Others	0.16791*	0.079
		STEM	0.11304	0.225

0.<p≤0.1

Table 2 shows post hoc LSD tests using one-way ANOVA. This test is to compare the mean between the effect of different disciplinary backgrounds on AI awareness, perception and adoption readiness in teaching and learning sessions.

4.1 AI Awareness

This section explores whether AI awareness significantly differs among lecturers from various disciplinary backgrounds. The hypotheses tested were as follows:

H_{01} (Null Hypothesis): There is no significant difference in AI awareness among lecturers from different disciplinary backgrounds.

H_{11} (Alternative Hypothesis): There is a significant difference in AI awareness among lecturers from different disciplinary backgrounds.

A one-way Analysis of Variance (ANOVA) was conducted to assess differences in AI awareness across three disciplinary categories: ICT, STEM, and Others. The ANOVA results did not show a statistically significant overall difference at the 0.05 significance level, indicating insufficient evidence to reject the null hypothesis at the omnibus level.

To further examine specific group differences, a post-hoc analysis using the Least Significant Difference (LSD) test was conducted (refer to Table 1). The results revealed a marginally significant difference in AI awareness between lecturers from the ICT and Others disciplines ($p = 0.053$), where ICT lecturers reported higher awareness of AI tools and concepts. No statistically significant differences were found between STEM and the other groups.

Although the overall ANOVA did not yield significance, the LSD post-hoc result suggests a meaningful disciplinary trend: lecturers in ICT fields demonstrate greater awareness of AI, likely due to the nature of their field which involves frequent interaction with emerging technologies. In contrast, lecturers from non-technical disciplines (Others) may have limited exposure to AI applications relevant to their teaching practices.

While the null hypothesis (H_{01}) cannot be fully rejected, the marginal significance observed provides partial support for the alternative hypothesis (H_{11}). These findings underscore the need for more inclusive AI-related training and awareness initiatives, especially targeting non-technical educators, to ensure balanced digital readiness across disciplines.

4.2 AI Perception

This section examines whether lecturers from different disciplinary backgrounds differ significantly in their perceptions of Artificial Intelligence AI in teaching and learning. The following hypotheses were tested:

H_{02} (Null Hypothesis): There is no significant difference in AI perception among lecturers from different disciplinary backgrounds.
H_{12} (Alternative Hypothesis): There is a significant difference in AI perception among lecturers from different disciplinary backgrounds.

A one-way ANOVA was conducted to compare mean perception scores across the three disciplinary groups: ICT, STEM, and Others. The analysis revealed no statistically significant overall differences in AI perception between the groups at the $p < 0.05$ level.

Referring to Table 2, a post-hoc analysis using the Least Significant Difference (LSD) test was performed to explore pairwise group differences. The LSD results confirmed that none of the comparisons between disciplines reached statistical significance. All p-values were well above 0.05, indicating that lecturers across all disciplines—technical and non-technical—held relatively similar views on the benefits, concerns, and implications of integrating AI in education.

These findings support the null hypothesis (H_{02}), suggesting that disciplinary background does not significantly influence lecturers' perceptions of AI. This may reflect the broader exposure to AI discourse in the education sector, where lecturers from all fields are increasingly aware of AI's potential to enhance teaching efficiency, personalize learning, and support administrative tasks. The convergence of perception across disciplines could also be attributed to institutional-level discussions, professional development sessions, and media coverage that provide shared narratives around AI's educational role.

The lack of significant perception differences is a positive indication for policy and curriculum developers, as it implies that professional development programs can adopt a unified approach to promoting ethical and effective AI use. Since lecturers across disciplines appear to recognize both the opportunities and challenges posed by AI, training can focus on practical integration strategies applicable across subject areas, rather than being narrowly discipline-specific.

In summary, the results provide no evidence to reject the null hypothesis. Lecturers in STEM, ICT, and non-technical disciplines demonstrated comparable perceptions of AI's role in education, highlighting a potential foundation for institution-wide AI adoption strategies.

4.3 AI Adoption Readiness

Lecturers' readiness to adopt AI in teaching differs significantly across disciplinary backgrounds as described in this section. The readiness construct reflects lecturers' confidence, willingness, and openness to integrating AI tools into instructional practices. The following hypotheses were tested:

H_{03} (Null Hypothesis): There is no significant difference in AI adoption readiness among lecturers from different disciplinary backgrounds.

H_{13} (Alternative Hypothesis): There is a significant difference in AI adoption readiness among lecturers from different disciplinary backgrounds.

A one-way ANOVA was conducted to compare AI adoption readiness scores among lecturers from ICT, STEM, and Others disciplines. The overall ANOVA did not show a statistically significant difference at the 0.05 level, indicating that the null hypothesis could not be fully rejected.

To further investigate possible pairwise differences, a post-hoc Least Significant Difference (LSD) test was performed (refer to Table 1). The analysis revealed a marginally significant difference between the ICT and Others groups ($p = 0.079$), with ICT lecturers reporting higher levels of readiness to adopt AI. No significant differences were found between the STEM group and the other two groups.

Although the overall test did not reach statistical significance, the marginal difference between ICT and Others suggests that lecturers with a technological background may feel more confident and prepared to integrate AI into their teaching practices. This is likely due to their familiarity with digital tools, exposure to emerging educational technologies, and higher levels of experimentation with AI platforms such as ChatGPT or other generative AI education tools.

In contrast, lecturers from non-technical disciplines (Others) may face barriers in readiness, such as limited exposure, lack of technical confidence, or uncertainty about how to practically implement AI tools in non-technical subjects. This gap underscores the need for targeted support to build digital pedagogical capacity among lecturers outside of ICT disciplines.

In conclusion, while the null hypothesis (H_{03}) cannot be rejected at the conventional threshold, the marginally significant difference between ICT and Others provides preliminary evidence

that disciplinary background may influence readiness for AI adoption. These findings highlight the need for inclusive professional development initiatives that equip all lecturers regardless of discipline with the necessary skills, strategies, and confidence to effectively adopt AI in teaching and learning.

5. Discussion

The results of this study provide insight into how lecturers at POLYCC are currently embracing AI. The findings provide a number of insights into how disciplinary background affects perception, awareness, and adoption readiness for implementing AI in learning environments.

First, a digital divide is suggested by the marginally significant post-hoc difference between ICT and non-technical fields (Others), even if no statistically significant difference in AI awareness was discovered at the overall level. ICT lecturers were better knowledgeable about AI technologies, probably as a result of their frequent use of computers and the quick advancement of technology in their industry. This is consistent with earlier research by (Zhai et al., 2021), which showed that lecturers in technologically demanding fields were more prepared for AI. The inference is that knowledge of AI is shaped by digital exposure rather than just years of expertise.

Second, perceptions about AI were largely the same in every disciplinary group. There was little difference in the lecturers' perspectives on the advantages and challenges of AI, regardless of whether they came from non-technical, STEM, or ICT backgrounds. As evidenced by the Malaysia Education Blueprint and the National AI Roadmap, this finding might be a reflection of the expanding national narrative and institutional debate surrounding AI. The dual potential of AI as a teaching tool and a challenge that needs ethical supervision seems to have been understood by lecturers. This is consistent with the findings of (Mulaudzi & Hamilton, 2024), who reported that after receiving sufficient information, lecturers' opinions shifted toward cautious optimism.

Third, the trend of awareness and preparedness to utilize AI technologies was similar. ICT lecturers once more demonstrated somewhat greater preparedness than those from non-technical subjects, despite the fact that the test's total results did not achieve significance. This supports the notion that confidence increases adoption intention and familiarity promotes confidence. Comfort with digital technologies is a key predictor of the willingness of educators to try AI in the classroom, according to earlier research (Ali et al., 2024).

Above all, the impressions are consistent across fields, indicating that any resistance is practical rather than ideological, generated by a lack of exposure, expertise, or institutional support. Therefore, discipline-inclusive, planned professional development can be a major facilitator. Case-based learning on the application of AI in their particular fields, practical training, and forums to discuss ethical issues can all be beneficial to non-technical educators.

Additionally, despite being relevant for the majority of responders, teaching experience did not significantly affect awareness or preparedness. This implies that without focused assistance, integrating AI may be difficult for even seasoned educators. Other factors like age, digital self-efficacy, or access to AI infrastructure might be investigated in future studies.

This study concludes by highlighting an important realization for policymakers and educational leaders: the adoption of AI involves a cultural and pedagogical transformation in addition to a technical one. It will be crucial to modernize education in Malaysia's technical and vocational sectors if all lecturers, regardless of discipline, are given the resources, self-assurance, and moral direction they need to handle AI.

6. Conclusion

This study investigated lecturers' awareness, perceptions, and adoption readiness use AI tools in their teaching practices at Malaysian Polytechnics and Community Colleges. The results showed that ICT lecturers had slightly greater awareness and preparedness or ready to adopt than their peers in non-technical subjects, even if there were not significant overall differences between disciplinary backgrounds. However, all groups' perceptions of AI were similar, indicating a common understanding of both the potential advantages and disadvantages of AI.

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