

Adoption and Impact of Generative AI on Teaching Strategies Among Community College Educators

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Abstract

This study investigates the adoption and impact of Generative Artificial Intelligence (GenAI) on teaching strategies among community college educators in Pahang, Malaysia. Guided by technology acceptance and pedagogical change perspectives, the research examines (i) the level of GenAI adoption, (ii) its relationship with teaching strategy transformation, (iii) perceived benefits and challenges, and (iv) demographic influences on adoption and impact. A quantitative cross-sectional survey design was employed, involving 132 lecturers selected through stratified random sampling. Data were collected using a structured questionnaire measuring GenAI adoption, perceived instructional impact, and benefits and challenges. Descriptive statistics, Pearson correlation, t-tests, and one-way ANOVA were used for analysis. Findings indicate a high level of GenAI adoption (all mean scores > 4.00), with strong internal reliability of measurement scales. A significant and strong positive correlation ($r = 0.867$, $p < .01$) was found between GenAI adoption and perceived impact on teaching strategies, suggesting that higher usage is associated with greater instructional adaptation in planning, delivery, assessment, and feedback. Major challenges include limited access to AI tools, ethical concerns, and risk of student over-dependence, while the most requested support involves clear guidelines and structured professional development. Teaching experience significantly influenced adoption levels, although no significant differences were found in perceived instructional impact. The study highlights the need for systematic governance, capacity-building, and responsible integration frameworks to sustain effective GenAI-enabled teaching practices in community college contexts.

Keywords: generative artificial intelligence, GenAI adoption, teaching strategies, community college educators

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Introduction

Generative Artificial Intelligence (GenAI) are AI system that is able to generate new content (e.g., text, images, audio, video, and code) with user prompts, often by means of large-scale machine learning models. GenAI technology (e.g., ChatGPT-like chatbots, integrated writing/analysis assistants, etc.) is becoming a common tool in higher education instructional preparation, content writing, formative assessment, and support of learners. Responsible use, academic integrity, transparency and staff capacity-building have also been the reactions of policy and quality-assurance bodies to make educational quality sustainable as adoption gains momentum (Sabzalieva & Valentini, 2023a).

The level of GenAI relevance is particularly high in Malaysia, as Polytechnique's and community colleges are directly included in the national higher-education quality ecosystem, and educators are supposed to guarantee valid and accountable learning outcomes operating in high-speed digital environments. According to the Malaysian Qualifications Agency (MQA), teaching and learning can be enriched with GenAI, however, there are risks (e.g., integrity, reliability, and misuse), which demand institutional direction and professionalism (Malaysian Qualifications Agency, 2023). Simultaneously, institutional policies (e.g., university-level documents on governance to be used as realistic references) emphasize the fact that employees and students should consider the outputs of GenAI in terms of validity, reliability, and transparency, instead of accepting the system as an authority figure (Universiti Teknologi Malaysia, 2024).

The community colleges are an especially consequential environment. They are TVET-oriented institutions, which focus on applied learning, industry orientation, and practical assessment scenarios where GenAI can interfere with lesson plans, assessment activities, feedback processes, and student interaction techniques. Recent open-access studies hosted in the polytechnic and community college (POLYCC) ecosystem of Malaysia indicate awareness and willingness of lecturers to embrace AI is unevenly distributed over disciplines, and non-technical disciplines may require increased development resources (Ahmad et al., 2025).

GenAI in Education: Pedagogical Opportunities and Constraints

Recent literature explains GenAI as a two-purpose educational technology: it is relevant to both increasing productivity and facilitating instructional design, but it brings its risks associated with credibility, bias, and integrity. Thematic surveys of ChatGPT-related literature show common advantages to include writing teaching resources, facilitating explanation and tutoring-like communication, encouraging brainstorming, and facilitating workflows of formative feedback; in their turn, they highlight the problems of hallucinations/inaccuracy, overdependence, ethical issues, and the threats of plagiarism (Ali, 2024; Sabzalieva & Valentini, 2023b).

In addition to general assertions, the open-access instructional design studies demonstrate how educators can coordinate GenAI to organized pedagogical frameworks. As an example, work in *Computers and Education: Artificial Intelligence* that is open access describes how GenAI tools can be categorized and aligned with the stages of inquiry-based lesson planning, including support of activity design, content creation, assessment, and feedback. This work is relevant to the context of TVET since inquiry-based and applied problem solving are typical instructional outcomes, and GenAI could transform the way lecturers structure learning tasks sequences instead of simply writing (Willert & Würz, 2025).

Simultaneously, the guidance at higher education emphasises that outputs of GenAI should be assessed and put in context, and institutional policy, audits, and staff development should be considered as the fundamental prerequisites of safe and useful implementation. As an illustration, the UNESCO quick-start guidance positions GenAI introduction as the process that needs organisational evaluation (AI audits), consultation with the stakeholders and the clear focus on privacy, integrity, and the development of the staff competence (Sabzalieva & Valentini, 2023a).

Policy and Governance Signals Relevant to Malaysia's Community College Context

The positioning of quality assurance is also apparent in Malaysia: the advisory note of GenAI by MQA concerns not only higher education institutions but also Polytechnique's and community colleges, and the premise of GenAI is a dynamic trend that can be used to enhance teaching and learning, but needs to be reinforced with a better comprehension of risks and responsible practice to maintain quality and integrity (Malaysian Qualifications Agency, 2023). This creates a professional governance norm according to which GenAI is to be governed by the competence-building and integrity protection instead of the informal and personal experimentation.

There are also institutional-level governance documents that offer operational guidance that is applicable in designing measurement items in this study. As an illustration, GenAI teaching and learning guideline of UTM focuses on the fact that academic personnel is expected to explain the purpose of GenAI use, will be accountable to the validity of results, and analyse outputs in terms of accountability, transparency, and reliability. Although this guideline is specific to a university, it belongs to the universal logic of governance the educators of community colleges have to deal with as well: responsible use is not a choice, and adoption cannot be achieved without evaluation competence or policy alignment (Universiti Teknologi Malaysia, 2024).

Another reason why educator perceptions are important is on the basis of international community-college sector reporting. Surveys and consultations of sector staff reveal that areas of employee concern usually focus on integrity, trustworthiness, job redesign, and the necessity of life-long professional learning; as staff concerns may diminish adoption or drive adoption into informal and inconsistent practices when institutional support is not clear. This is why the measurement of contributions and difficulties is worthwhile in adoption research instead of adoption being discussed as a technological availability problem (California Community Colleges Chancellor's Office, 2024).

Theoretical Foundations for Studying GenAI Adoption and Teaching Strategy Change

The acceptance and diffusion perspectives are widely used to explain adoption in terms of education technology research. Technology Acceptance Model (TAM) focuses on perceived usefulness and perceived ease of use as the key predictors of technologies acceptance whereas the Unified Theory of Acceptance and Use of Technology (UTAUT) introduce social influence and facilitating conditions as particularly important in the institutional context where practice is determined by training, policy, and leadership. Such frameworks are applicable to GenAI since the choice of educators to use a particular instructional strategy is dependent on the perceived instructional value, the level of confidence and effort needed, peer pressure, and institutional facilitation (Davis, 1989; Venkatesh et al., 2003).

Pedagogical technology frameworks emphasize teaching strategies on the fact that tools should not only affect effectiveness but also the choice of instructional design. More recent GenAI design-oriented studies present sequences of inquiry activity planning, assessment support generation, and feedback structuring use cases, which are related to tangible strategy changes (e.g., faster lesson plans versioning, varied activity versions, feedback templating). Open-access literature has suggested a human-AI hybrid co-design approach to keep the objectives of learning in balance with the assistance of GenAI as a partner-in-planning instead of an authoritative (Dogan, 2025; Willert & Würz, 2025).

The implication to this study would be to measure adoption as a behaviour (what educator are doing with GenAI) but also understand adoption interpretation in terms of perception and support conditions (why educators are doing it and why are they constrained). This is in line with the demands in the guidance documents to train, clarify the policy, and a consistent review of the educational impacts of GenAI (California Community Colleges Chancellor's Office, 2024; Sabzalieva & Valentini, 2023b).

Empirical Evidence on Educators' GenAI Use, Benefits, and Challenges

Empirical studies of GenAI use among educators are growing at an impressive rate, and trends are both encouraging and limiting. When open-access instruments are developed with TAM groundwork, educator survey has demonstrated that the dimensions of acceptance can be reliably measured under GenAI/ChatGPT specifics and combined with demographic profiling, which proves the possibility of the structured questionnaire measurement in the given research (Barakat et al., 2025).

In the POLYCC ecosystem of Malaysia, more recent open-access quantitative data (n-134) reveals more or less the same perceptions of benefits/challenges across disciplines, though there is a significant trend: ICT lecturers might be more aware/ready than non-technical disciplines, with a difference in capacity and confidence. This has a direct implication on Pahang community colleges since it implies that adoption and impact can be patterned with regard to field of study, which supports the use of stratified sampling and demographic analysis in the current research design (Ahmad et al., 2025).

In more general research on educators education, there also are studies in open-access that emphasize that the perceived benefits tend to pertain to time savings (planning and materials), scaffolding of explanations, and aiding differentiation, whereas perceived issues are customarily issues related to accuracy, ethics, privacy, and the potential to harm authentic learning. GenAI competency and self-efficacy are becoming defined as separate constructs that determine the ability of educators to incorporate GenAI responsibly and effectively, which implies that items related to capability are relevant in the challenges domain (e.g., skill gaps, training needs) (California Community Colleges Chancellor's Office, 2024 ; Xia, 2025).

Despite the availability of global and regional guidance, as well as, the initial empirical research, there is still a high demand on local evidence on community college educators in Malaysia – specifically in the state of Pahang – connecting (i) adoption rate, (ii) perceived advantages/disadvantages, (iii) changes in specific teaching strategies. The POLYCC study can serve as a good precedent but is not a replacement of a Pahang-specific community college investigation of the effects of GenAI (not general AI) adoption and teaching strategies. Thus, the current research fills this gap with the help of a cross-sectional, stratified survey that will measure the levels of adoption and test the relationships and group differences in line with the

above stated objectives (Ahmad et al., 2025; Malaysian Qualifications Agency, 2023; Sabzalieva & Valentini, 2023a).

Methodology

Research Design

In this study, a quantitative and cross-sectional survey design will be used to quantify the levels of GenAI adoption, perceived effects on teaching strategies, and perceived benefits/challenges of community college educators in Pahang. The cross-sectional method is appropriate since the research is designed to establish the baseline and measure relationships and group differences at one point instead of assessing longitudinal change.

Population, Setting, and Sample Size

The intended study sample is community college instructors in Pahang, Malaysia (N = 200). The sampling size will be 132 minimum as calculated according to Krejcie and Morgan sampling table methodology of small populations. In order to safeguard representativeness in the different colleges and disciplines, the study employs stratified random sampling (Krejcie & Morgan, 1970).

Sampling Technique and Procedure

(i) community college institution and (ii) field of study/discipline grouping (e.g., ICT/technical vs non-technical, aligned to local evidence that readiness can differ by discipline) will be used to create strata. In every stratum, the participants will be picked on the basis of random selection (e.g., by assigning random numbers to the list of the staff members delivered via institutional channels). This design enhances the external validity of the Pahang community colleges and allows testing the demographic differences that will be the focal point of the Objective 4 (Ahmad et al., 2025).

Research Instrument and Measures

Data will be collected using a structured Google Form questionnaire with four sections:

- Section A: Demographics. Age group, sex, teaching experience, highest qualification, institution, and study area/discipline, and previous exposure/training to GenAI.
- Section B: GenAI Adoption Scale. Items assess frequency and breadth of GenAI use to teach tasks (e.g., lesson planning, preparation of content/material, design of activities, drafting of assessments, drafting of rubrics/feedback, and administrative teaching support). The content of the item is based on a recorded use cases of education and design-oriented mappings of GenAI to planning and assessment processes (Dogan, 2025; Willert & Würz, 2025).
- Section C: Effect on Teaching Strategy Scale. The use of GenAI in planning quality/speed, differentiation, inquiry/activity design, feedback cycles and assessment approaches are measured using items that are perceived to be changed as a result of GenAI use. This is in line with the open-access instructional design literature that places GenAI as a co-designer that facilitates systematic lesson design and a feedback process (Dogan, 2025; Willert & Würz, 2025).
- Section D: Perception Scale (Benefits and Challenges). Benefits items represent synthesised gains that are frequent (efficiency, idea generation, scaffolding, feedback

support). Challenges items align with integrity, trustworthiness, bias/inaccuracy, privacy, and skill/training needs, which aligns with systematic review and industry guidance that highlight the importance of integrity and reliability evaluation in terms of an obligation (Ali, 2024; California Community Colleges Chancellor's Office, 2024; Malaysian Qualifications Agency, 2023).

The non-demographic questions will be based on a five-point Likert scale ranging between 1 (Strongly Disagree) and 5 (Strongly Agree).

Validity of Instrument

Expert review will be used to establish the content validity of 2–3 educators in education technology or TVET with expertise in the implementation and design of GenAI. The items will be screened in accordance with their clarity, applicability to the community college teaching activities, and their relevancy to the responsible-use considerations (e.g., validating outputs, integrity considerations) (Malaysian Qualifications Agency, 2023).

Data Collection Procedure

The Google Form link was shared on institutional channels (staff email lists and college administrative communication groups) after institutional permissions have been acquired. The initial page will contain the information about the study and informed consent. The participation will be voluntary and no personally identifying data will be gathered except the broad demographics. The collection of the data will last about 2–3 weeks or until the target sample is achieved.

Data Analysis Plan

The analysis was done with the use of statistical software (e.g., SPSS). Objective 1 (adoption levels) and summarise benefits/challenges were addressed using descriptive statistics (means, standard deviations, frequencies). In the case of Objective 2, Pearson correlation was used to test the relationship between adoption scores and teaching strategy impact scores. In Objective 3, descriptive analysis was used also. In Objective 4, independent samples t-tests and one-way ANOVA will be used to test the differences in adoption and perceived impact between demographic groups for example, discipline, experience bands, age bands (Ahmad et al., 2025).

Ethical Considerations

Rights of ethical protection involve informed consent, confidentiality, voluntary involvement and data security. It was explained to the participants that the answers are utilized in research purposes exclusively and will be published in the aggregate. The study did not also collect sensitive instances of misconduct given the guidance on integrity and responsible use of GenAI; moreover, the research will focus on measuring the perceptions and practices at the attitude level and self-reported use of GenAI (Malaysian Qualifications Agency, 2023; Sabzalieva & Valentini, 2023a).

Results

Demographic Analysis

Table 1

Demographic Profile

Respondents Demographic	Frequency	Percentage
Gender		
Female	89	67.4%
Male	43	32.6%
Age Group		
20–29 years old	3	2.3%
30–39 years old	46	34.8%
40–49 years old	79	59.8%
50 years and above	4	3.0%
Teaching experience		
11–15 years	57	43.2%
5–10 years	27	20.5%
More than 15 years	48	36.4%
Field of teaching		
Akuakultur	3	2.3%
Aquaculture	4	3.0%
Building	3	2.3%
Business	9	6.8%
Culinary	3	2.3%
Engineering	44	33.3%
Fashion	3	2.3%
Fashion	8	6.1%
Fesyen	2	1.5%
Hospitaliti	12	9.1%
Information Technology	37	28.0%
Pengajian Am	4	3.0%

The demographic characteristics of the respondents have been summarised in table 1. The majority of the respondents were of the female gender (67.4%), whereas males were 32.6. The majority of the respondents were 40–49 years (59.8%), 30–39 years (34.8%), and only a small number of respondents were 20–29 years (2.3%), 50 years and beyond (3.0%). With regards to the teaching experience, the highest group was 11–15 years (43.2%), then more than 15 years (36.4%), and 5–10 years (20.5%). The participants were selected in various disciplines, the largest participants (33.3%) being in the field of Engineering and (28.0%) in the field of Information Technology.

Descriptive Findings for GenAI Adoption

Table 2
Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
B1. I frequently use Generative AI tools in my teaching practice.	132	2	5	4.16	.809
B2. I feel confident in using Generative AI for teaching and learning.	132	2	5	4.27	.666
B3. I actively explore different Generative AI applications for education	132	2	5	4.08	.762
B4. My institution encourages the use of Generative AI in teaching	132	3	5	4.17	.690
B5. I intend to continue adopting Generative AI in future teaching practices	132	3	5	4.30	.641
Valid N (listwise)	132				

Table 2 indicates that the GenAI is adopted at a high level among the community college educators (N = 132) with all the items registering a mean score of more than 4.00. The results showed that the respondents were willing to continue using GenAI in teaching in the future (M = 4.30, SD = 0.641) and they had great confidence in using GenAI both in teaching and learning (M = 4.27, SD = 0.666). GenAI was also frequently used in the teaching practice (M = 4.16, SD = 0.809). The institutional encouragement was viewed in a positive way (M = 4.17, SD = 0.690), whereas the active exploration of the various GenAI applications was high (M = 4.08, SD = 0.762). Generally, the findings indicate high intention to uptake and maintain adoption.

Descriptive Statistics for Perceived Benefits and Challenges of GenAI

Table 3
Challenges in Using Generative AI

	N	%
Concerns about ethical use	4	3.0%
Concerns about ethical use, Risk of student over-dependence on AI	14	10.6%
Lack of knowledge or skills	6	4.5%
Lack of knowledge or skills, Lack of training opportunities	10	7.6%
Lack of knowledge or skills, Lack of training opportunities, Concerns about ethical use	4	3.0%
Lack of knowledge or skills, Lack of training opportunities, Limited access to AI tools	6	4.5%
Lack of knowledge or skills, Lack of training opportunities, Limited access to AI tools, Concerns about ethical use, Risk of student over-dependence on AI	4	3.0%
Lack of knowledge or skills, Lack of training opportunities, Limited access to AI tools, Risk of student over-dependence on AI	4	3.0%
Lack of knowledge or skills, Lack of training opportunities, Limited access to AI tools, Risk of student over-dependence on AI, Time constraints	4	3.0%
Lack of knowledge or skills, Lack of training opportunities, Risk of student over-dependence on AI	4	3.0%

Lack of knowledge or skills, Lack of training opportunities, Time constraints	4	3.0%
Lack of knowledge or skills, Limited access to AI tools	3	2.3%
Lack of training opportunities, Concerns about ethical use, Risk of student over-dependence on AI	10	7.6%
Lack of training opportunities, Limited access to AI tools	6	4.5%
Lack of training opportunities, Risk of student over-dependence on AI	3	2.3%
Limited access to AI tools	12	9.1%
Limited access to AI tools, Concerns about ethical use	15	11.4%
Limited access to AI tools, Concerns about ethical use, Risk of student over-dependence on AI	7	5.3%
Limited access to AI tools, Risk of student over-dependence on AI	3	2.3%
Limited access to AI tools, Risk of student over-dependence on AI, Time constraints	3	2.3%
Risk of student over-dependence on AI, Time constraints	6	4.5%

Table 3 shows that perceived barriers of using GenAI are multi-faceted and that they tend to co-exist based on the results of the respondents. Limited access to AI tools in conjunction with ethical concerns (11.4%), and ethical considerations along with over-dependence risk of students (10.6) were the most frequent reported issues. Moreover, inaccessibility to AI tools alone constituted 9.1, which represents infrastructure and availability as a significant limitation. There are also several responses that emphasise the gaps in capabilities, with the absence of knowledge/skills and trainings opportunities being seen in various combinations proving the significance of organised capacity-building. All in all, the results indicate that the access, ethics, and issues with student dependency are the prevailing challenges that inform the implementation of GenAI.

Table 4
Support or Training Needed

	N	%
Access to AI tools and software	9	6.8%
Access to AI tools and software, Guidelines or best practices for AI use in teaching	10	7.6%
Access to AI tools and software, Guidelines or best practices for AI use in teaching, Institutional policy and encouragement	3	2.3%
Access to AI tools and software, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice	3	2.3%
Access to AI tools and software, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice, Institutional policy and encouragement	4	3.0%
Access to AI tools and software, Peer sharing or community of practice	3	2.3%
Formal training or workshops on Generative AI	6	4.5%
Formal training or workshops on Generative AI, Access to AI tools and software, Guidelines or best practices for AI use in teaching	3	2.3%
Formal training or workshops on Generative AI, Access to AI tools and software, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice	7	5.3%

Formal training or workshops on Generative AI, Access to AI tools and software, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice, Institutional policy and encouragement	3	2.3%
Formal training or workshops on Generative AI, Guidelines or best practices for AI use in teaching	7	5.3%
Formal training or workshops on Generative AI, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice	3	2.3%
Formal training or workshops on Generative AI, Technical support from institution	3	2.3%
Formal training or workshops on Generative AI, Technical support from institution, Access to AI tools and software	4	3.0%
Formal training or workshops on Generative AI, Technical support from institution, Access to AI tools and software, Guidelines or best practices for AI use in teaching	4	3.0%
Formal training or workshops on Generative AI, Technical support from institution, Access to AI tools and software, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice, Institutional policy and encouragement	15	11.4%
Formal training or workshops on Generative AI, Technical support from institution, Guidelines or best practices for AI use in teaching, Peer sharing or community of practice	4	3.0%
Guidelines or best practices for AI use in teaching	21	15.9%
Guidelines or best practices for AI use in teaching, Peer sharing or community of practice	6	4.5%
Peer sharing or community of practice	10	7.6%
Technical support from institution, Access to AI tools and software, Peer sharing or community of practice, Institutional policy and encouragement	4	3.0%

Table 4 bring together the categories of support or training that respondents reported they would require to increase GenAI integration in teaching. Guidelines or best practices on AI use in teaching (15.9% in the first place) was the most often requested need, which demonstrates the high demand to have a clear and practical guidance regarding how to use AI in the classroom. One of the biggest combined requirements was a holistic package of formal training/workshops, technical assistance, access to AI resources, guidelines, peer exchange/community of practice, and institutional policy / encouragement (11.4%), implying that many lecturers need multi-layered assistance, not single ones. Furthermore, peer sharing/community of practice and access to AI tools and software was mentioned in the response's multiple times, which served as support to the significance of both resources and collaborative capacity-building.

Table 5
Correlation Analysis

		GenAI Adoption Scale	Impact on Teaching Strategy Scale
b. GenAI Adoption Scale	Pearson Correlation	1	.867**
	Sig. (2-tailed)		.000
	N	132	132
Impact on Teaching Strategy Scale	Pearson Correlation	.867**	1
	Sig. (2-tailed)	.000	
	N	132	132

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

Table 5 demonstrates that GenAI adoption has a strong, positive, and significant association with the perceived influence on teaching strategies ($r = 0.867, p < .01, N = 132$). This means that the higher the lecturers reported the greater was GenAI adoption, the more they reported the changes in their teaching strategies. The size of the correlation indicates a highly strong association, which means that the use of GenAI is closely associated with perceived instructional adaptation in such areas as planning, delivery, assessment, and feedback. On the whole, the finding validates RO2 by showing that the more GenAI is adopted the more pronounced the reported effect on teaching strategy.

Group Differences

Table 6
Independent Samples t-Test (Sex)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
GenAI Adoption Scale	Equal variances assumed	2.259	.135	-1.348	130	.180	-.15417	.11438	-.38046	.07212
	Equal variances not assumed			-1.467	103.652	.145	-.15417	.10510	-.36259	.05425
Impact on Teaching Strategy Scale	Equal variances assumed	9.580	.002	-1.537	130	.127	-.15103	.09827	-.34545	.04339
	Equal variances not assumed			-1.745	114.803	.084	-.15103	.08654	-.32246	.02040

Table 6 indicates that sex does not significantly influence either GenAI adoption or perceived impact on teaching strategies. For the GenAI Adoption Scale, Levene’s test was not significant ($p = .135$), so equal variances were assumed; the t-test showed no significant difference between males and females, $t(130) = -1.348, p = .180$, with a small mean difference (-0.154) and a 95% CI that crosses zero ($-0.380, 0.072$). For the Impact on Teaching Strategy Scale, Levene’s test was significant ($p = .002$), so equal variances were not assumed; the result remained non-significant, $t(114.803) = -1.745, p = .084$ (95% CI: $-0.322, 0.020$).

Overall, the measurement scales demonstrated very good reliability (GenAI adoption $\alpha = 0.915$; teaching strategy impact $\alpha = 0.887$). Respondents were mainly female (67.4%) and largely aged 40–49 years (59.8%), with most having 11–15 years of experience (43.2%). GenAI adoption was high across all items (means > 4.00). Key challenges centred on access, ethics, and student over-dependence, while the most requested support was clear guidelines and comprehensive training. GenAI adoption strongly correlated with teaching strategy impact (r

= 0.867, $p < .01$). Sex differences were not significant, but experience significantly affected adoption.

Discussion

Level of GenAI Adoption Among Educators in Pahang

The results of the descriptive analysis show that the GenAI adoption level is high, and the mean score of all five items of the adoption is greater than 4.00. The trend indicates that GenAI is no longer used to trial but is actively used in the common practice of instructional support. Recent educator-centred evidence also emphasizes that institutional backing and educator confidence are two variables that are tightly connected with the implementation of GenAI in teaching work that is done in a long-term perspective (Collie et al., 2024). Practically, the adoption scale has good reliability which provides further evidence to the fact that adoption is being recorded regularly in the given population of educators.

Impact of GenAI Adoption on Teaching Strategies

The correlation test revealed that the GenAI adoption was strongly positively associated with the perceived effect on teaching strategies ($r = .867$, $p = .01$). This suggests that educator who report increased GenAI usage also report increased change in the instructional planning practices and the practices related to instructional delivery. GenAI has been placed as a co-design tool that could help reduce the time spent in the lesson planning process, create alternative activity designs, and aid in structuring feedback based on the problematic focus of the present study (Dogan, 2025; Willert & Würz, 2025). Although the correlation does not define causality, the extent of association implies that GenAI use is strongly linked with perceived pedagogical adaptation.

Perceived Benefits and Challenges of GenAI in Teaching and Learning

Challenges profile indicates that barriers do not stand alone, they often co-exist. The greatest themes revolve around inadequate access to tools, ethical, and dangers of student over-dependence. This corresponds to open-access syntheses of GenAI in education that continue to highlight integrity, reliability of outputs, and dependency on students as constant risks that need in advance governance and capacity-building (Noroozi et al., 2024; Sabzalieva & Valentini, 2023b). The results of the support needs support this interpretation: the most often among the educators are asked guidelines or best practice, and the most significant number of respondents would like to get a full set of support that includes training, technical support, access, peer learning and encouragement of an institutional policy. It is a reflection of the international guidance that emphasizes the presence of transparent institutional structures and personnel training as the conditions to do such implementation responsibly (Sabzalieva & Valentini, 2023b).

Demographic Differences in Adoption and Impact

Examination of groups reveals no sexually statistically significant adoption differences or perceived impact differences. Nevertheless, the adoption of GenAI was also greatly affected by teaching experience ($p = .002$) but not by the perceived impact on teaching strategies ($p = .112$). This implies that experience might influence willingness or comfort to embrace GenAI, yet when adopted, the effect of the latter on instruction might be experienced differently at the

experience level. The previous studies show that educator GenAI self-efficacy and valuing are the main sources of integration, and this motivation may depend on the background traits and workplace conditions (Collie et al., 2024). Based on this, the adoption differences attributed to experience in this study are most likely to be unequally confident or interpolated as useful or exposed to facilitating support.

Conclusion

In general, the use of GenAI among the educators of the Pahang community college is high and it is closely related with the perceived change of the teaching strategy. Among the major limitations, one can single out access to tools, ethical issues and the risk of student's dependency, whereas the most obvious areas of support include guidelines and thorough training. The perceived impact of teaching-strategy is not differentiated by experience, whereas adoption is. These results confirm the necessity of a systematic regulation and the development of capacity to maintain responsible and efficient GenAI-enabled teaching practice.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that Grammarly, an AI-assisted writing software, was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The author further declares that, apart from Grammarly, no other AI or AI-assisted technologies have been used to generate content in writing the manuscript. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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