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Digital Teaching Innovation through International Community Engagement: AI-Assisted Interactive Learning for Prospective Teachers in Malaysia

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Abstract

This international community-engagement programme aimed to strengthen prospective English teachers' competence in using artificial intelligence creatively, critically, ethically, and pedagogically for interactive learning. Implemented by Indonesian facilitators at Johor Business School, Universiti Tun Hussein Onn Malaysia, the programme engaged eight participants through presentations, demonstrations, case analysis, collaborative problem-solving, and presentation-back activities. Participants examined classroom issues involving lesson design, source verification, academic integrity, privacy, learner dependence, and responsible disclosure of AI use. The activities developed understanding of AI literacy, technological pedagogical content knowledge, critical thinking, digital ethics, and human-centred education. Practical outputs comprised interactive lesson designs, classroom guidelines, presentations, feedback, learning materials, and dissemination resources. The programme demonstrated how international community service can integrate teaching expertise, knowledge transfer, intercultural exchange, and research development within the Tridharma framework. Continuing mentoring, classroom observation, collaborative lesson development, institutional partnerships, and longitudinal evaluation are recommended to sustain responsible AI-supported teaching practices across educational contexts.

Keywords: AI literacy; digital teaching innovation; international community engagement; prospective teachers; responsible artificial intelligence.

1. INTRODUCTION

1.1 Digital Transformation and Artificial Intelligence in Education

Digital transformation has accelerated the incorporation of generative artificial intelligence into educational practice internationally and across Indonesia. Generative AI can assist educators in constructing lesson plans, formulating learning objectives, preparing differentiated materials, developing questions, and producing examples suited to learners' proficiency levels. Moundridou et al. (2024) demonstrate its value for designing inquiry-based lesson plans, although teacher review remains indispensable. Baidoo-Anu and Owusu Ansah (2023) identify opportunities for personalised learning, rapid feedback, and instructional support. Kohnke et al. (2023) explain that conversational AI can facilitate language practice, material adaptation, and learner interaction. Lo (2023) nevertheless observes that educational benefits depend on carefully designed activities and informed institutional responses. Grassini (2023) similarly argues that generative systems should augment rather than displace educators' pedagogical judgement. In Indonesia, these applications offer practical opportunities to expand access to learning resources, but their adoption must accommodate uneven digital infrastructure, linguistic diversity, curriculum requirements, and variations in institutional readiness.

1.2 AI Competence among Prospective Teachers

Prospective teachers require multidimensional AI competence because technical familiarity alone does not ensure educationally appropriate application. AI literacy involves understanding how systems generate outputs, recognising their limitations, evaluating their recommendations, and using them responsibly within pedagogical settings. Ayanwale et al. (2024) indicate that prospective teachers' AI literacy encompasses knowledge, ethical awareness, recognition, and practical application. Laupichler et al. (2022) argue that AI education must develop conceptual understanding alongside critical evaluation and responsible participation. Southworth et al. (2023) place technical knowledge, ethical judgement, and human-centred problem-solving within an integrated literacy framework. Kim and Kwon (2023) show that teacher readiness also depends on confidence, perceived relevance, and opportunities for practical experience. Wang et al. (2023) further emphasise the importance of verifying AI-generated claims and understanding algorithmic limitations. For Indonesian prospective teachers, these capabilities should be connected with subject knowledge, local curricula, inclusive teaching, and national professional standards. Accordingly, teacher education must cultivate AI literacy, digital ethics, source verification, critical thinking, and pedagogical competence concurrently.

1.3 Academic Integrity and Human-Centred AI

Generative AI introduces significant concerns regarding academic integrity and the preservation of human agency in education. Unacknowledged AI-generated submissions can obscure authorship and weaken opportunities for learners to demonstrate independent understanding. Rudolph et al. (2023) warn that unrestricted chatbot use challenges conventional assessment and requires reconsideration of how learning is evidenced. Susnjak (2022) shows that sophisticated language models can produce convincing academic responses, making traditional approaches to misconduct detection increasingly inadequate. Alkaissi and

McFarlane (2023) demonstrate that generated texts may contain fabricated references and authoritative-sounding misinformation. Krügel et al. (2023) identify further ethical risks arising from biased and inconsistent AI recommendations. Mhlanga (2023) highlights concerns involving privacy, data governance, unequal access, transparency, and excessive technological dependence. Human-centred implementation must consequently maintain teachers' professional authority and learners' intellectual responsibility. Within Indonesian education, responsible practice should require transparent disclosure, independent source verification, protection of personal data, authentic assessment, and critical examination of algorithmic outputs rather than treating computational fluency as equivalent to trustworthy knowledge.

1.4 International Community Service within Indonesian Higher Education

Community service constitutes an obligatory component of the Indonesian Tridharma, together with education and research, and provides a mechanism for transferring academic expertise to communities. Christwardana et al. (2022) describe community-oriented experiential programmes as a means of connecting higher education with practical competence and social needs. Compare et al. (2023) explain that service-learning can unite academic learning, civic responsibility, and reciprocal community engagement. Kaliappen (2024) similarly positions community-engaged learning as an avenue for applying disciplinary knowledge to authentic social challenges. International engagement expands this function across national boundaries by encouraging intercultural learning, institutional cooperation, and the contextual exchange of educational practices. Deardorff and Jones (2022) emphasise that meaningful internationalisation requires purposeful interaction and intercultural reflection rather than physical mobility alone. Horton and Brown (2024) further argue that global service-learning should be founded on reciprocity, partnership, and shared responsibility. Consequently, international community service allows Indonesian universities to enact Tridharma obligations while strengthening regional relationships, adapting academic knowledge to partner needs, and generating opportunities for continuing educational collaboration.

1.5 Partner Needs and Programme Rationale

Prospective English teachers at Johor Business School, Universiti Tun Hussein Onn Malaysia, operate within an educational environment increasingly influenced by generative AI. Structured assistance is therefore required to ensure that AI is used for pedagogical improvement rather than merely for rapid content production. Moorhouse and Kohnke (2024) observe that language educators need practical guidance for selecting, prompting, evaluating, and adapting generative technologies. Yan (2023) demonstrates that ChatGPT can support language learning through explanations, interaction, and feedback, although its responses require professional scrutiny. Kostka and Toncelli (2023) stress that language teachers must assess generated materials for accuracy, appropriateness, inclusiveness, and alignment with learning objectives. Jeon and Lee (2023) identify teachers' emerging roles as instructional designers, evaluators, and ethical mediators when conversational AI enters language education. Liu and Ma (2024) further show that effective adoption depends on technological knowledge, pedagogical beliefs, and critical AI literacy. The programme was therefore designed to address identifiable needs concerning lesson design, interactive learning, source verification,

academic integrity, creative prompting, and preservation of teacher and learner agency.

1.6 Programme Objective

The programme aimed to strengthen participants' knowledge, literacy, and practical ability to employ artificial intelligence creatively, critically, ethically, and pedagogically in interactive English-language learning. This objective recognised that meaningful AI competence develops through guided application, reflection, verification, and the resolution of authentic educational problems. Ng et al. (2023) maintain that AI education should enable learners to understand, apply, evaluate, and create with intelligent systems. Kong et al. (2023) demonstrate that structured AI-literacy activities can strengthen conceptual knowledge and ethical awareness. Meegan et al. (2025) show that scenario-based intervention can support prospective teachers' AI literacy and professional confidence. Huang et al. (2025) similarly establish the importance of combining technical proficiency, creative application, critical evaluation, communication, and ethical competence in language-teacher preparation. Daher et al. (2025) recommend embedding AI literacy within initial teacher education rather than treating it as optional supplementary training. Accordingly, the programme combined explanations, demonstrations, case analysis, collaborative problem-solving, and participant presentations to position AI as a supervised pedagogical resource rather than a substitute for intellectual effort or professional judgement.

2. CONCEPTUAL AND PROGRAMME FOUNDATIONS

2.1 Artificial Intelligence in Education

Artificial intelligence is transforming instructional practices by supporting planning, resource development, classroom communication, feedback, and assessment. Internationally, AI systems assist teachers in identifying learning needs, sequencing activities, generating examples, and adapting materials to different proficiency levels. Crompton and Burke (2023) explain that educational AI increasingly facilitates personalisation, prediction, assessment, and instructional support. Ouyang et al. (2022) emphasise that its educational value depends on pedagogically informed human–AI interaction. Holmes and Tuomi (2022) argue that educators must connect technological capabilities with clearly defined learning purposes rather than adopting AI merely because it is available. Gardner et al. (2021) demonstrate that AI-supported assessment may provide timely diagnostic information, although validity and professional oversight remain essential. Zhai et al. (2021) similarly position machine learning as a means of strengthening adaptive instruction and learning analytics. In Indonesian English education, AI can support lesson planning, bilingual material creation, simulated dialogue, formative feedback, and differentiated assessment, provided that teachers verify linguistic accuracy, cultural appropriateness, curriculum alignment, and accessibility.

2.2 Artificial Intelligence Literacy

Artificial intelligence literacy comprises the interconnected competencies needed to understand, operate, evaluate, create with, and ethically manage intelligent systems. Chiu et al. (2024) distinguish basic knowledge of AI from the competence to apply that knowledge effectively within particular social and professional contexts. Almatrafi et al. (2024) organise AI literacy around

recognising, understanding, applying, evaluating, and creating with AI while maintaining ethical awareness. Carolus et al. (2023) further demonstrate that literacy includes technical comprehension, practical application, critical appraisal, and responsible conduct. Lintner (2024) argues that users should understand both the functional possibilities and wider societal consequences of algorithmic systems. Casal-Otero et al. (2023) emphasise that AI literacy education must address concepts, applications, evaluation, ethics, and interdisciplinary problem-solving. Internationally, these competencies enable prospective teachers to scrutinise generated information instead of accepting it uncritically. Within Indonesian teacher education, AI literacy should also encompass prompt construction, source verification, bias recognition, privacy awareness, culturally sensitive material adaptation, and the ability to explain why AI is—or is not—pedagogically appropriate.

2.3 Technological Pedagogical Content Knowledge

The Technological Pedagogical Content Knowledge framework explains that effective AI integration requires more than isolated technological proficiency. Technological knowledge enables prospective teachers to operate generative platforms, whereas pedagogical knowledge guides activity design, classroom interaction, differentiation, and assessment. Content knowledge ensures that generated English vocabulary, grammar, discourse, pronunciation guidance, and cultural representations remain accurate. Farhadi and Öztürk (2023) show that prospective English teachers require balanced development across these domains. Genç and Dülger (2024) similarly identify TPACK as an important foundation for selecting technologies that correspond with language-learning objectives. Darsih et al. (2023) demonstrate that digital integration becomes pedagogically meaningful when technology supports, rather than dictates, instructional decisions. Rahimi and Rezvani (2024) extend this reasoning by highlighting AI's potential to strengthen English instructors' technological and pedagogical knowledge. Lakhe Shrestha and Krolak-Schwerdt (2025) further argue that continuing professional development is necessary because generative systems evolve rapidly. In Indonesian and international teacher education, AI-enhanced TPACK should therefore connect tool selection, learner characteristics, English-language content, teaching methods, and ethical judgement.

2.4 Interactive and Student-Centred Learning

AI can strengthen student-centred learning when it creates opportunities for inquiry, dialogue, cooperation, practice, and reflection rather than encouraging passive content consumption. Pahi et al. (2024) demonstrate how collaboration between teachers and generative AI can provide immediate assistance during active classroom exercises. Kim et al. (2022) conceptualise student–AI collaboration as progressing from learning about AI to learning from and alongside it. Hopfenbeck et al. (2023) explain that AI-supported formative assessment can assist feedback, self-assessment, and peer assessment, although teachers must preserve learners' agency. Al Shloul et al. (2024) associate activity-based learning supported by ChatGPT with participatory problem-solving and instructional engagement. Ogunleye et al. (2024) nevertheless caution that generative tools require pedagogical structure, verification, and equitable access. In English-language classrooms, teachers can employ AI to generate questioning prompts, dialogue scenarios, role-play characters, debate positions, collaborative writing tasks, and proficiency-sensitive materials. Indonesian classrooms may particularly benefit from adaptable bilingual

resources, but discussion, negotiation, peer explanation, and teacher feedback should remain central to the learning process.

2.5 Digital Ethics and Academic Integrity

Digital ethics and academic integrity provide essential safeguards for educational AI use. Responsible practice requires transparent acknowledgement of AI assistance, verification of sources, protection of personal information, respect for intellectual ownership, and clear differentiation between assistance and authorship. Bozkurt et al. (2024) argue that generative AI complicates conventional understandings of intellectual contribution, ownership, and human-machine co-creation. Gruenhagen et al. (2024) show that institutional responses must recognise students' varied purposes and levels of understanding rather than relying exclusively on prohibition. Bittle and El-Gayar (2025) identify undisclosed generation, fabricated evidence, unreliable attribution, and weakened authorship as significant integrity concerns. Kofinas et al. (2025) demonstrate that apparently authentic assessment tasks may remain vulnerable to generative substitution, necessitating attention to learning processes and oral justification. Sullivan et al. (2023) consequently recommend assessment redesign and explicit guidance about permissible practices. In Indonesia, ethical protocols should require disclosure of AI-supported work, independent checking of references, informed consent before processing personal data, and preservation of learners' original reasoning. Teachers must also clarify that fluent output does not guarantee factual, linguistic, or cultural reliability.

2.6 Participatory International Community Engagement

Participatory international community engagement should be grounded in shared decision-making, reciprocity, contextual relevance, collaborative problem-solving, and intercultural knowledge exchange. Delaine et al. (2023) identify trust, communication, shared power, and mutually recognised benefits as foundations of reciprocal community-academic partnerships. Sugawara et al. (2023) explain that community engagement becomes meaningful when institutional expertise responds to locally articulated priorities rather than imposing predetermined solutions. Mauro et al. (2024) similarly regard reciprocity as an ongoing relational practice involving reflection, negotiation, and responsiveness. Hackett et al. (2023) demonstrate that structured international collaboration can facilitate intercultural competence when participants engage directly with alternative perspectives. Borger et al. (2022) further show that collaborative international learning requires purposeful interaction and opportunities to examine cultural assumptions. Accordingly, an Indonesia-Malaysia AI-education programme should treat Malaysian prospective teachers as knowledge partners whose experiences shape activities, examples, and recommendations. Indonesian facilitators contribute pedagogical expertise, while partner feedback supports contextual adaptation. This reciprocal orientation transforms community service from one-directional knowledge transfer into collaborative regional learning and provides a foundation for sustainable institutional cooperation.

3. PROGRAMME IMPLEMENTATION AND RESULTS

3.1 Programme Setting and Participants

The international community-service programme was conducted on 22 June 2026 at the Al-Jazari Auditorium, Tunku Tun Aminah

Library, Universiti Tun Hussein Onn Malaysia. Eight prospective teachers from the English Department participated in the programme, which addressed responsible artificial-intelligence application in interactive language teaching. The relatively small group enabled intensive dialogue, individual participation, collaborative analysis, and direct pedagogical guidance. This arrangement corresponded with Darling-Hammond et al. (2022), who emphasise active participation and disciplinary relevance in meaningful professional learning. Philipsen et al. (2023) maintain that technology-oriented teacher development should connect theoretical understanding with authentic teaching problems. Trust et al. (2023) similarly regard guided exploration as essential for preparing prospective teachers to manage generative AI. Barrett and Pack (2023) underline the importance of contextualised AI education rather than generic technological training. Walter (2024) further recommends aligning teacher-development activities with participants' professional roles and anticipated classroom responsibilities. Consequently, the programme treated participants as prospective educators who would eventually make independent pedagogical and ethical decisions concerning classroom AI use.

3.2 Preparation Stage

Programme preparation involved coordination with the Malaysian partner, identification of participants' learning requirements, preparation of educational materials, selection of classroom cases, activity sequencing, and allocation of facilitator responsibilities. The design prioritised problems relevant to prospective English teachers, including AI-assisted lesson planning, material generation, source verification, learner dependence, plagiarism, and ethical disclosure. Howard et al. (2022) argue that professional learning becomes more relevant when digital competence is connected with teachers' specific pedagogical responsibilities. Cutri et al. (2022) recommend incorporating practical modelling, experimentation, and reflection into technology-related teacher preparation. Falloon (2020) positions digital competence as an integration of technical, pedagogical, ethical, and professional judgement. Schmidt and Tang (2020) similarly emphasise the need for technology activities that reflect authentic classroom conditions. Nazaretsky et al. (2022) demonstrate the importance of structured professional development for developing informed trust in educational AI. These principles informed a coherent learning progression in which facilitator presentations introduced essential concepts, case exercises exposed practical dilemmas, and participant presentations supported application and reflection.

3.3 Programme Delivery

Programme delivery combined short presentations, demonstrations, classroom cases, individual exercises, group analysis, presentation development, and pedagogical feedback. Facilitators first explained how generative AI could support lesson planning, language-material adaptation, questioning, feedback, and interactive learning. Demonstrations then illustrated prompting and output evaluation, after which participants examined cases concerning accuracy, bias, authorship, disclosure, and learner dependence. Kasneci et al. (2023) recommend guided experimentation because educational benefits depend on users' capacity to evaluate generated responses. Farrokhnia et al. (2024) similarly argue that generative AI activities should balance instructional opportunities against weaknesses such as misinformation and overreliance. Tlili et al. (2023) emphasise maintaining human oversight when conversational AI enters education. Lim et al. (2023) propose treating generative AI as a pedagogical partner whose outputs

require critical mediation. Walter (2024) further associates effective professional learning with active, collaborative, and practice-oriented experiences. Accordingly, delivery moved progressively from facilitator explanation towards participant application, collaborative interpretation, presentation, and feedback rather than remaining a one-directional lecture.

3.4 Participant Engagement

Participant engagement was reflected in questions, discussion, collaborative case analysis, group presentations, and responses to hypothetical classroom AI dilemmas. Participants considered whether particular practices constituted legitimate assistance, ethically conditional use, or unacceptable substitution of learner effort. Collaborative discussion enabled contrasting interpretations to be articulated and justified before shared recommendations were presented. Bond et al. (2020) identify interaction, participation, and cognitive investment as interrelated dimensions of student engagement in technology-supported learning. Redmond et al. (2021) emphasise that meaningful engagement includes behavioural contribution, emotional involvement, social interaction, collaboration, and higher-order thinking. Ferreira et al. (2025) regard collaborative learning as particularly valuable for developing communication, reasoning, and twenty-first-century teaching competence. Glaister et al. (2024) show that peer dialogue can extend learning by allowing participants to test ideas outside purely individual tasks. Jurkowski and Hänze (2024) further demonstrate the value of collaboration within teacher-development activities. In this programme, engagement therefore functioned as evidence of participants' active interpretation of AI-related pedagogical and ethical problems rather than passive receipt of information.

3.5 Development of AI Literacy and Ethical Awareness

The programme developed AI literacy by helping participants classify classroom practices into three categories: permitted use, use requiring permission or disclosure, and prohibited practice. Permitted applications included brainstorming, language practice, and preliminary material development when human checking remained evident. Activities involving assessed work, personal information, copyrighted materials, or substantial AI-generated contributions were regarded as requiring authorisation, acknowledgement, or disclosure. Submitting generated work as independent authorship, fabricating sources, processing sensitive data without consent, and using AI to replace required learning were classified as prohibited. Chan (2023) argues that educational AI policies should explain acceptable and unacceptable practice through accessible, context-sensitive guidance. Dai et al. (2025) similarly identify transparency, accountability, privacy, and human oversight as central policy concerns. Akgun and Greenhow (2022) emphasise fairness, autonomy, and protection from algorithmic harm. Holmes et al. (2022) call for ethical AI education that preserves human rights and learner agency. Bearman and Ajjawi (2023) further maintain that assessment decisions should protect meaningful human participation. The resulting classification transformed abstract ethics into practical classroom judgements.

3.6 Academic Integrity and Plagiarism Prevention

Academic-integrity guidance centred on authentic assignments, acknowledgement of sources, disclosure of AI assistance, documentation of the learning process, and oral explanation of submitted work. Authentic tasks were recommended because they connect assessment with personal experience, contextual

judgement, classroom application, and defensible reasoning. Cotton et al. (2024) argue that institutional responses to generative AI should combine clear expectations with assessment redesign. Dawson et al. (2024) caution that AI-detection systems cannot provide a sufficient foundation for determining misconduct. Perkins et al. (2024) likewise demonstrate that automated detection remains vulnerable to reliability and fairness problems. Liu and Bridgeman (2023) recommend strengthening authorship evidence through drafts, revision records, citations, and reflection. Ellis and Murdoch (2024) position oral explanation as a useful means of verifying understanding and restoring dialogue to assessment. Accordingly, participants were encouraged to require learners to preserve prompts, drafts, feedback, and revisions; identify where AI contributed; verify cited sources independently; and explain the reasoning underpinning final products. These strategies prioritise demonstrable learning over policing technology alone.

3.7 Critical and Creative Thinking Development

Critical and creative thinking was structured through five connected actions: asking, understanding, analysing, creating, and evaluating AI-generated information. Asking involved formulating purposeful questions and prompts, while understanding required identifying the meaning and assumptions contained in generated responses. Analysis focused on evidence, consistency, bias, omissions, and contextual appropriateness. Creation required participants to transform useful information into original pedagogical products rather than reproduce machine-generated text. Evaluation involved judging accuracy, ethical acceptability, instructional value, and alignment with intended learning outcomes. Lee (2024) argues that generative AI should be accompanied by deliberate critical-thinking instruction. Gonsalves (2024) uses Bloom's taxonomy to show that AI activities must progress beyond retrieval towards analysis, evaluation, and creation. Darvishi et al. (2024) demonstrate that feedback is most productive when learners remain cognitively responsible for revising their work. Essien et al. (2024) warn that uncritical reliance can weaken independent reasoning. Sánchez Muñoz et al. (2025) alternatively position AI as a cognitive mediator when learners test, refine, and defend ideas. The programme therefore treated AI output as material for intellectual examination rather than a finished answer.

3.8 Programme Outputs

The programme produced educational materials, participant group presentations, proposed classroom AI guidelines, interactive learning designs, facilitator feedback, activity documentation, and materials supporting dissemination and publication. Educational resources consolidated concepts concerning AI literacy, prompting, verification, ethics, academic integrity, and interactive English teaching. Group presentations demonstrated participants' interpretation of classroom cases, while proposed guidelines translated ethical principles into operational distinctions between permitted, conditional, and prohibited practices. Interactive designs illustrated how AI could support questioning, discussion, role-play, collaborative learning, and formative feedback without replacing teacher judgement. Collie (2024) associates structured professional support with stronger teacher confidence in generative-AI integration. Moorhouse et al. (2024) demonstrate the value of developing professional generative-AI competence through targeted teacher-education intervention. Luckin et al. (2022) maintain that AI readiness requires informed pedagogical decision-making rather than technical access alone. Lucas et al. (2024)

connect digital competence with calibrated trust in AI. Richter et al. (2024) further emphasise coherence, relevance, participant learning, and application in evaluating professional development. Collectively, the outputs provide foundations for follow-up mentoring, classroom adaptation, institutional collaboration, and scholarly dissemination.

4. DISCUSSION

4.1 Participatory Outreach and Authentic Learning

The programme's participatory structure transformed educational material from abstract information into knowledge that prospective teachers could interpret and apply. Case analysis situated AI principles within recognisable classroom dilemmas involving authorship, inaccurate information, learner dependency, and ethical disclosure. Lee et al. (2022) explain that authentic learning becomes effective when participants confront realistic professional situations requiring contextual judgement. Collaborative problem-solving further encouraged participants to negotiate meanings, compare solutions, and assume shared responsibility for decisions. Liu and Pásztor (2022) associate problem-based learning with the development of higher-order thinking, particularly when learners must justify proposed solutions. Sun et al. (2022) similarly demonstrate that successful collaborative problem-solving depends on communication and coordinated knowledge construction. Presentation-back activities required groups to reorganise their analysis into defensible recommendations, thereby revealing misunderstandings that could be addressed through facilitator feedback. Tijsma et al. (2023) regard reflection, collaboration, responsibility, and real-world problem-solving as central mechanisms of service learning. Vlachopoulos and Makri (2024) further connect authentic assessment with communication, creativity, and knowledge transfer. These principles are applicable to participatory outreach in both Indonesian and international teacher education.

4.2 Prospective Teachers' AI Competence

The programme indicates that prospective teachers' AI competence should integrate technological capability with pedagogy, disciplinary knowledge, critical judgement, and ethical responsibility. Celik (2023) extends TPACK by arguing that teachers require ethical knowledge to evaluate how intelligent systems influence educational decisions. Ng et al. (2021) conceptualise AI literacy as encompassing understanding, application, evaluation, and ethical awareness rather than operational proficiency alone. Kohnke et al. (2023) similarly contend that language teachers must evaluate generated content, construct effective prompts, and align AI use with communicative learning objectives. Critical thinking is necessary because plausible AI responses may contain fabricated evidence, cultural bias, or inappropriate linguistic representations. Larson et al. (2024) emphasise that critical engagement involves scrutinising both generated information and the human assumptions underlying its production. Professional competence must also preserve academic integrity, data privacy, learner autonomy, and inclusive participation. Miao and Cukurova (2024) therefore position human-centred AI competence around agency, accountability, transparency, and pedagogical purpose. For Indonesian and Malaysian prospective teachers, effective AI integration consequently requires balanced technological, pedagogical, linguistic, intercultural, and ethical judgement.

4.3 AI as a Learning Partner

AI should function as a learning partner that supports idea generation, explanation, formative feedback, and reflection while leaving intellectual responsibility with learners and professional accountability with teachers. Chan and Hu (2023) observe that generative AI may expand access to personalised explanations and brainstorming, but its educational value depends on critical and purposeful use. Grassini (2023) similarly argues that AI can stimulate creativity and improve learning support when its limitations remain visible. Excessive reliance may nevertheless reduce productive struggle, independent reasoning, and learners' willingness to evaluate evidence. Krushinskaia et al. (2025) show that agency during AI interaction depends on users' monitoring, self-regulation, and control over decision-making. Wu et al. (2025) therefore advocate symbiotic learning in which AI contributes resources while human learners retain epistemic agency and adopt appropriate critical positions towards generated knowledge. Teacher judgement remains indispensable for interpreting learner needs, social relationships, cultural context, and ethical consequences. Tan et al. (2025) likewise conclude that AI-supported professional practice requires continuing teacher mediation. Accordingly, AI should extend human cognition and pedagogical capacity without becoming a substitute for either.

4.4 International Knowledge Exchange

Interaction between Indonesian facilitators and Malaysian participants created a reciprocal space for intercultural learning and regional educational cooperation. International exchange is most valuable when knowledge is negotiated rather than transferred as a supposedly universal model. Chan et al. (2021) show that international service learning can strengthen intercultural effectiveness by exposing participants to different assumptions, practices, and social contexts. Gregory and Mathew (2021) caution that reciprocal learning is necessary to avoid reproducing unequal or one-directional relationships. Chambers and Lavery (2022) similarly demonstrate that international service learning enables prospective teachers to develop professional awareness through engagement with unfamiliar cultural and educational environments. In the present programme, Malaysian participants could interpret AI principles through their curriculum, institutional expectations, language-learning priorities, and classroom realities, while Indonesian facilitators gained insight into neighbouring educational practices. Bowen et al. (2021) establish that bidirectional international learning can produce mutual benefit when local priorities guide collaboration. Xu et al. (2025) further associate global engagement with prospective teachers' culturally responsive professional development. Such exchanges strengthen Indonesia–Malaysia cooperation while supporting contextual rather than mechanical adoption of AI principles.

4.5 Tridharma Integration

The programme illustrates Tridharma integration by connecting university teaching, community service, and research within an international academic setting. Pedagogical expertise developed through university teaching was translated into accessible materials, classroom cases, demonstrations, and collaborative activities for prospective teachers. Amutuhaire (2023) argues that internationalised community engagement can enrich teaching and scholarship while advancing universities' social responsibilities. Ampofo et al. (2024) similarly show that community-engaged learning connects academic knowledge with contextual

understanding and professional practice. Community service should therefore be understood as a reciprocal knowledge process rather than the one-way dissemination of university expertise. Visser et al. (2025) explain that reciprocal university–community partnerships can strengthen the third mission through sustained collaboration and mutual benefit. Programme observations may subsequently identify questions concerning AI competence, academic integrity, culturally responsive implementation, and teacher agency. Koekkoek et al. (2021) associate engaged education with the co-creation of knowledge across institutional and societal boundaries. Franco et al. (2023) further demonstrate that community engagement can inform curriculum renewal and socially relevant research. Consequently, programme reflection may support revised teaching materials, future empirical studies, and collaborative academic publications (Cholifah et al., 2026).

4.6 Programme Sustainability

Programme sustainability requires movement from a single workshop towards continuing professional and institutional collaboration. Follow-up workshops can deepen participants' competence as AI platforms, classroom practices, and ethical concerns evolve. Glover et al. (2024) demonstrate that effective mentoring depends on relational support, reflection, and responsiveness to teachers' changing professional needs. Virtual mentoring may maintain contact between Indonesian facilitators and Malaysian prospective teachers while reducing geographical and financial barriers. Bowen et al. (2021) show that virtual exchange can sustain bidirectional international learning at comparatively low cost. Collaborative lesson design and shared digital repositories could allow participants to adapt prompts, cases, rubrics, and ethical guidance to different English-learning contexts (Ilhamalimy et al., 2025). Vahed and Rodriguez (2021) associate sustained virtual collaboration with intercultural learning and internationalisation of the curriculum. Teacher exchanges and joint publications could subsequently convert practical experience into institutional knowledge. Ocupa-Cabrera et al. (2025) connect mentoring with university social responsibility and durable professional development. Institutional AI guidelines should also be periodically reviewed through participation by educators, students, administrators, and technology specialists. Bearman et al. (2024) emphasise that sustainable educational responses to AI require collective capability, assessment reform, and continuing organisational learning (Merina et al., 2026).

5. CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS

5.1 Conclusion

The programme aimed to strengthen prospective English teachers' capacity to employ artificial intelligence critically, ethically, and pedagogically within interactive learning. Conducted through presentations, demonstrations, case analysis, collaborative problem-solving, and presentation-back activities, the programme engaged eight participants in interpreting realistic classroom dilemmas rather than merely learning technological procedures. Participants developed a clearer understanding of responsible AI use, including the distinction between permitted assistance, conditional use requiring disclosure, and prohibited practices that replace genuine learning. Practical outputs included learning materials, group presentations, classroom AI guidelines, interactive lesson designs, facilitator feedback, and dissemination materials. Chiu et al. (2023) maintain that successful educational AI adoption

requires pedagogical purpose, teacher competence, and organisational support. Crompton and Burke (2023) similarly identify ethical and instructional readiness as essential foundations. UNESCO-oriented analysis by Bozkurt et al. (2024) highlights the continuing importance of human agency. Ogunleye et al. (2024) emphasise critical verification, while Wiese et al. (2025) underline systematic ethics education. Overall, the programme established a practical foundation for responsible AI-supported teaching (Pertwi et al., 2026).

5.2 Practical Implications

The programme offers practical value for prospective teachers, lecturers, teacher-education institutions, community-engagement organisers, and international partners. Prospective teachers can apply its case-based framework when deciding whether AI supports or undermines intended learning. Lecturers may use authentic assignments, process documentation, oral explanation, and AI-use disclosure to maintain academic integrity while encouraging experimentation. Yusuf et al. (2024) show that teachers require sustained professional development to translate AI awareness into pedagogical practice. Strzelecki (2024) indicates that perceived usefulness must be accompanied by competence and responsible-use expectations. Teacher-education institutions should consequently provide guided opportunities for lesson design, output verification, and ethical reflection. Community-engagement organisers may adopt participatory activities that respond to local needs and produce reusable educational resources. Abenir et al. (2024) demonstrate that responsive communication and collaborative coordination strengthen community-learning outcomes. Sabbaghi (2024) connects service learning with socially relevant experiential education, while Rodríguez-Zurita et al. (2024) emphasise partnership and sustainability. International partners can therefore use the programme as an adaptable model for reciprocal regional capacity development (Sihotang et al., 2025).

5.3 Institutional Implications

Teacher-education institutions should embed AI ethics, academic integrity, critical thinking, source verification, privacy protection, and human-centred pedagogy across curricula rather than confining them to a single technology course. Perkins et al. (2023) argue that generative-AI competence must include ethical awareness, transparency, and critical evaluation. Lund and Wang (2023) similarly emphasise information literacy because fluent outputs may contain fabricated references or misleading claims. Institutions should establish progressive learning outcomes covering prompt construction, evidence checking, bias recognition, copyright, disclosure, data protection, and accountable decision-making. Johnston et al. (2024) demonstrate that students require explicit institutional guidance regarding acceptable AI use. García-López and Trujillo-Liñán (2025) identify privacy, inequality, bias, and accountability as central regulatory concerns. Wiese et al. (2025) further recommend moving AI ethics from abstract principles towards context-sensitive educational practice. Within Indonesian teacher education, these competencies should be incorporated into educational technology, teaching methodology, assessment, research methods, and practicum courses. Such integration would prepare graduates to adopt AI selectively while preserving learner agency, professional responsibility, inclusive education, and meaningful human relationships (Suhud et al., 2025).

5.4 Tridharma and Internationalisation Implications

International community service can integrate the Tridharma functions of teaching, research, and service while strengthening sustainable institutional internationalisation. In this programme, university teaching expertise was translated into socially relevant knowledge through materials, demonstrations, classroom cases, and collaborative activities for Malaysian prospective teachers. Miller et al. (2021) explain that global service learning can combine community engagement with student learning and scholarly development. García-Rico et al. (2021) associate service learning in teacher education with professional competence and sustainability-oriented education. Dapena et al. (2022) demonstrate that digitally supported service learning can extend participation beyond geographical boundaries. Derreth and Wear (2021) nevertheless emphasise that community-engaged education should remain reciprocal and socially responsive. Abenir et al. (2024) similarly show that sustained communication and responsiveness are crucial to partner benefit. Programme observations can generate future research questions concerning AI literacy, teacher judgement, integrity, and intercultural adaptation, while reflective findings may inform curricula and publications. Thus, Indonesia–Malaysia engagement can evolve from a discrete outreach event into a mutually beneficial teaching, research, and institutional partnership (Suhud et al., 2026).

5.5 Limitations

Several limitations restrict the interpretation and transferability of the programme's apparent learning developments. First, participation was limited to eight prospective teachers, meaning that the observed engagement cannot represent the wider population of Malaysian or Indonesian teacher-education students. Second, the short programme duration permitted intensive introductory learning but could not establish whether ethical understanding or AI-supported teaching competence persisted. Third, implementation within one institutional and disciplinary context limits applicability across universities, subject areas, and educational levels. Fourth, the absence of pre-test and post-test measurements prevents quantified estimation of learning change. The evidence also relied on facilitator observation and participant-generated outputs rather than validated competence measures or classroom behaviour. Caspari-Sadeghi (2023) notes that small-group educational evaluations offer contextual depth but limited generalisability. Klingbeil et al. (2024) emphasise the importance of longitudinal evidence for assessing enduring educational development. Richter et al. (2023) recommend combining multiple indicators when evaluating professional learning. Lepp et al. (2023) highlight the limitations of self-reported digital competence, while Viberg et al. (2024) advocate performance-based evaluation of AI literacy.

5.6 Recommendations

Future programmes should combine continuing mentoring with direct observation of classroom practice to determine how prospective teachers translate responsible-AI principles into pedagogical decisions. Reflective journals could document changing beliefs, uncertainties, verification practices, and responses to ethical dilemmas, while follow-up interviews could clarify how institutional expectations shape AI use. Arnsby et al. (2025) show that mentor education can sustain professional learning beyond an initial intervention. Goldshaft et al. (2025) emphasise observation, dialogue, and contextual support during

teaching practice. Wolor et al. (2025) further demonstrate that structured training and mentoring can strengthen learning agility and innovative behaviour. Collaborative Indonesia–Malaysia lesson-design projects should produce adaptable activities, assessment rubrics, disclosure templates, and multilingual digital resources. Abenir et al. (2024) indicate that active communication and responsiveness sustain cross-institutional engagement. Wolor et al. (2023) similarly highlight the importance of social relationships, regular interaction, and community empowerment in sustaining collaborative development. Faulconer (2021) recommends structured reflection and assessment in online service learning, while Dapena et al. (2022) demonstrate the value of digitally mediated collaboration. Gaffar et al. (2022) show that academic support, digital media, and external cooperation can accelerate technology-related competence development. Future evaluation should employ larger multi-institutional samples, pre-tests and post-tests, teaching artefacts, classroom observations, and longitudinal measurement. Suhud et al. (2021) demonstrate the value of examining continued technology use rather than initial adoption alone. Broader partnerships could support teacher exchanges, joint research, comparative publications, and regularly updated institutional AI guidelines. Given the potential risks associated with intensive digital engagement, longitudinal evaluations should also examine dependency, self-regulation, and responsible technology use (Suhud et al., 2024).

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