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Building Future-Ready Education Leaders through Artificial Intelligence and Digital Literacy: Community Engagement Program at Johor Business School, Universiti Tun Hussein Onn Malaysia

Listiyaning Handayani^{1*}, Widya Arti Anggraini², Soni Wandrial³, Wahyuning Darwati⁴, Devi Desianti Pritasari⁵, Muhammad Ikhwan⁶, Roni Faslah⁷, Suryo Adrianto⁸, Usep Suhud⁹, Doni Sugianto Sihotang¹⁰

^{1, 4, 5, 6, 7, 8, 9, 10} Universitas Negeri Jakarta

² Universitas Ummi Bogor

³ Binus University

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***Corresponding author:** Listiyaning Handayani

Abstract

This study examines a community engagement program designed to prepare future education leaders to navigate educational transformation through artificial intelligence (AI) and digital literacy. Conducted at Johor Business School, Universiti Tun Hussein Onn Malaysia (UTHM), the program integrates Future School concepts, strategic and ethical educational leadership, responsible AI, and Problem-Based Learning (PBL). The study describes the program design, implementation, and evaluation, emphasizing the development of leadership judgment, AI literacy, ethical decision-making, and collaborative problem-solving. The findings indicate improved understanding of Future School, adaptive educational leadership, responsible AI use, and the analysis of AI-related educational cases. The study concludes by highlighting implications for sustainable leadership development and international community engagement.

Keywords: Future School, Strategic Leadership, Responsible AI, Problem-Based Learning, Universiti Tun Hussein Onn Malaysia.

INTRODUCTION

1. The Transformation of Educational Leadership in the AI Era

Artificial Intelligence (AI) is reshaping educational leadership by changing how educational institutions interpret information, coordinate people, and make strategic decisions. The emergence of

AI-enabled systems introduces opportunities to automate routine administrative activities, generate data-informed insights, support instructional planning, and personalize learning experiences. Consequently, educational leaders are increasingly expected to move beyond conventional administrative responsibilities toward strategic roles that connect technological innovation with

institutional objectives (Sihotang, 2026). Recent evidence indicates that AI can support decision-making and administrative efficiency, but its implementation simultaneously requires leaders to address ethical, equity, and human-centred considerations. Educational leadership in the AI era therefore involves not simply adopting technological tools, but developing institutional capacity to determine where, why, and under what conditions AI should be used (Renta-Davids et al., 2025).

The transformation also requires educational leaders to develop stronger capabilities for managing organizational change. AI adoption can affect professional roles, established workflows, communication patterns, and expectations concerning teaching and learning (Suhud, Caniago, Sihotang et al., 2026). Leaders must consequently articulate a clear digital vision, facilitate collaboration, empower educators, and maintain organizational adaptability when technologies and educational demands change rapidly. Within the Future School perspective, leadership is understood as an adaptive organizational capability rather than a purely hierarchical function. The PKM program accordingly introduced Strategic Educational Leadership, Leadership in VUCA Environment, Mindful Leadership, Ethical Leadership, Distributed Leadership, and Agile School Management to help participants understand how leadership competencies can be mobilized in complex and uncertain educational environments. Hael et al. (2024) similarly identify vision, digital empowerment, collaboration, innovation, and dynamic adaptation as important dimensions of digital leadership (Cholifah, Suhud, Sihotang et al., 2027).

AI-driven transformation also changes the relationship between educational leaders and institutional decision-making. Leaders increasingly need to interpret algorithmically generated information while retaining professional judgment and responsibility for consequential decisions (Suhud, Caniago, Sihotang et al., 2026). This requires a balance between technological capability and human expertise rather than an assumption that AI-generated outputs are inherently objective or superior. The issue is particularly important when AI is used to inform educational assessment, student support, resource allocation, or institutional planning, because these applications may affect individuals with different needs and levels of digital access (Sihotang, 2027). In this context, the educational leader becomes an intermediary between technological systems and human stakeholders, responsible for ensuring that innovation remains aligned with educational purposes and organizational values. The development of hybrid competencies involving leadership, technical knowledge, and cognitive capabilities is therefore increasingly important in AI-mediated work environments (La Sala et al., 2024).

Ethical governance represents another fundamental dimension of this transformation. AI may produce benefits for educational organizations while simultaneously generating concerns related to privacy, data protection, algorithmic bias, copyright, academic integrity, transparency, and accountability. These issues cannot be addressed adequately through technical training alone because they require leaders to make contextual judgments about acceptable and unacceptable uses of technology (Sihotang, Suhud, Handaru et al., 2027). The PKM program explicitly positioned AI as an issue of leadership rather than merely a technological instrument: decisions concerning AI were expected to consider pedagogical objectives, affected stakeholders, integrity, privacy, transparency, and

accountability. This orientation corresponds with the emerging emphasis on inclusive and ethical AI leadership, in which technological innovation must remain connected to educational equity and the needs of diverse learners (Scott et al., 2025).

2. Artificial Intelligence and Digital Literacy as Emerging Leadership Competencies

The transformation of educational leadership makes AI literacy an increasingly important professional competency. AI literacy should not be reduced to the ability to operate generative AI applications or formulate effective prompts (Suhud, Allan, Hoo et al., 2026). Rather, it encompasses understanding how AI systems function, recognizing their capabilities and limitations, critically evaluating their outputs, and considering the social and ethical consequences of their use. Such a multidimensional understanding is particularly relevant for educational leaders because they are responsible for establishing institutional expectations regarding technology use. The PKM program therefore emphasized understanding AI opportunities and risks rather than training participants to master a particular application, with attention to responsible use, critical assessment, and leadership responses to real educational problems (Suhud, Boonkaew, Sihotang et al., 2025). Research on pre-service teachers likewise demonstrates that AI literacy requires competencies extending beyond technical familiarity toward the ability to use, evaluate, create, and solve problems through AI-supported practices (Ayanwale et al., 2024).

Digital leadership extends this competency from individual technological knowledge toward organizational transformation. A digitally capable leader must understand how technological change influences people, organizational routines, professional development, and institutional culture. This means creating conditions in which teachers and other educational stakeholders can experiment with emerging technologies while receiving appropriate guidance and support (Sihotang, Suhud, Reztriandi et al., 2027). In the PKM context, the leadership component emphasized vision, adaptation, empowerment, collaboration, and ethical responsibility, while the AI literacy component focused on understanding technological limitations and evaluating outputs critically. These dimensions were deliberately integrated rather than delivered as independent training topics, because future-ready leadership requires leaders to connect technological possibilities with organizational priorities and human needs. Hoang (2025) similarly highlights the growing importance of e-leadership development as educators integrate AI into professional and instructional practices (Suhud, Sihotang, Allan et al., 2026).

AI literacy also requires social-emotional capabilities because technology adoption can generate uncertainty, anxiety, resistance, and uneven confidence among educational stakeholders. Leaders therefore need interpersonal competencies that enable them to communicate technological changes, acknowledge concerns, foster trust, and encourage responsible experimentation. A purely technical conception of AI literacy may overlook these human dimensions and consequently fail to prepare educators for the organizational realities of AI adoption (Suhud, Sihotang, Juliana et al., 2026). The emerging perspective instead treats AI competence as a combination of technological understanding, critical judgment, communication, and social responsibility. This is particularly relevant to educational leadership because leaders must support both individual capability development and collective institutional learning. Recent scholarship argues for stronger integration between AI literacy and social-emotional competencies so that

technology-related learning can address not only what individuals know about AI but also how they respond to and work with AI in educational contexts (Palmquist et al., 2026).

3. Program Rationale, Objectives, and Contribution

The rationale for the community engagement program emerged from a practical gap between accelerating AI development and the preparedness of future educational leaders to govern its use responsibly (Suhud, Sihotang, Chanthawong et al., 2026). The needs assessment identified variation in participants' understanding of Future School, strategic and ethical leadership, VUCA navigation, and agile school management, alongside limited comprehensive understanding of AI boundaries, data privacy, copyright, bias, transparency, and academic integrity. Participants also needed greater capacity to analyze cases, consider stakeholder interests, evaluate risks and benefits, and formulate recommendations for AI use in educational settings. These needs demonstrate that future-ready leadership cannot be developed through technology-oriented training alone; it requires an integrated approach that connects leadership capabilities with AI literacy and ethical decision-making. Javed and Muftaba (2026) further emphasize the relationship among AI literacy, AI anxiety, and digital leadership, reinforcing the importance of developing technological competence alongside leadership capacity (Suhud, Wolor, Sulistyowati et al., 2025).

Against this background, the program was designed to strengthen adaptive educational leadership while developing participants' capacity to understand and govern AI responsibly. Its objectives included strengthening competencies related to Future School, Strategic Leadership, VUCA Navigation, Mindful Leadership, Ethical Leadership, and Agile School Management; improving participants' understanding of responsible AI use; and developing their ability to analyze AI-related educational cases through Problem-Based Learning (PBL). The program therefore moved beyond a conventional workshop model based on information transfer. Interactive lectures provided conceptual foundations, while PBL created an opportunity for participants to apply leadership and AI concepts to authentic problems and formulate context-sensitive recommendations. This orientation is consistent with the broader movement toward educational leadership that combines technological awareness, strategic judgment, and human-centred decision-making (Suhud, Nair, Chee Hoo et al., 2026).

The distinctive contribution of the program lies in its integration of educational leadership, AI literacy, responsible AI, and experiential problem solving within an international community engagement setting. Rather than treating AI competence as an isolated technical skill, the program conceptualized AI as an object of leadership decision-making and institutional governance. Participants were encouraged to move from "understanding AI" toward "managing the use of AI" by identifying risks, considering stakeholder interests, evaluating alternatives, and developing policy-oriented recommendations. This integrated approach is particularly relevant as higher education and schools increasingly encounter AI-enabled educational environments that require leaders capable of coordinating technological, pedagogical, and organizational change (Sihotang, Suhud, Handaru et al., 2027). The program consequently contributes a practical model for developing future-ready leaders through capacity building that combines conceptual learning, critical analysis, ethical reflection, and collaborative problem solving. The broader literature on AI and Digital Leadership 4.0 similarly indicates that educational institutions

require leadership capabilities capable of aligning technological transformation with organizational development and institutional priorities (Udhubi et al., 2026).

PROGRAM DESIGN AND COMMUNITY ENGAGEMENT METHODS

1. Community Context, Partner, and Participants

The community engagement program was designed within the context of accelerating digital transformation in education and the growing need to prepare future education leaders for AI-mediated educational environments. The program was implemented at the Tunku Tun Aminah Library, Universiti Tun Hussein Onn Malaysia (UTHM), Parit Raja, Batu Pahat, Johor, Malaysia, which functions as a modern learning centre supporting academic activities, digital literacy development, and international collaboration (Suhud, Sihotang, Boonkaew et al., 2026). The partner institution provided the physical and technological infrastructure required for the program, coordinated participants, supported discussion activities, and contributed to documentation and evaluation. The activity was conducted on 22 June 2026 as part of academic collaboration between Universitas Negeri Jakarta (UNJ) and UTHM. The participant group was positioned as prospective education leaders who required strengthened understanding of Future School, adaptive educational leadership, and responsible AI use. The program responded specifically to identified variations in participants' understanding of Future School, strategic leadership, VUCA navigation, ethical leadership, agile school management, and AI-related ethical boundaries (Suhud, Unarto, Sugianto Sihotang et al., 2026).

2. Capacity-Building Intervention: Interactive Lecture and PBL

The intervention adopted a participatory capacity-building approach in which participants were positioned as active learners rather than passive recipients of information. The learning design consisted of conceptual strengthening through interactive lectures followed by application through Problem-Based Learning (PBL), presentation, feedback, and reflection. The interactive lectures addressed Future School Concept, Strategic Educational Leadership, Leadership in VUCA Environment, VUCA Prime, Sensemaking, Mindful Leadership, Ethical Leadership, Distributed Leadership, Agile School Management, Future-ready School Culture, and Leadership Roadmap (Ilhamalimy, Husen, Suparno et al., 2025). AI-related content addressed opportunities for AI in learning, instructional preparation, assessment, and differentiated learning, alongside privacy, copyright, plagiarism, academic integrity, responsible use, and the boundaries of AI in educational decision-making. The program deliberately avoided focusing on mastery of a particular AI application. Instead, participants were expected to understand AI capabilities and limitations and consider its implications for educational leadership (Sihotang, Suhud, Wibowo, 2025).

PBL functioned as the principal mechanism for translating conceptual knowledge into practical decision-making. Participants analyzed a case concerning students' use of AI in completing school assignments. Through group discussion, they identified the educational problem, mapped stakeholder interests, assessed potential risks and benefits, considered ethical and academic-integrity issues, and developed alternative responses. The groups subsequently presented their recommendations and participated in

collective reflection. This design enabled leadership, technology, and ethical considerations to be examined simultaneously rather than as separate learning domains. The resulting recommendations were oriented toward responsible AI implementation in schools, moving the learning process from understanding AI toward managing its educational use. The approach therefore emphasized critical analysis, collaborative reasoning, contextual judgment, and policy-oriented thinking.

3. Data Collection and Evaluation Strategy

Program evaluation employed multiple complementary techniques to assess implementation and participant learning. Observations were used to document participant engagement during interactive lectures and PBL activities, while pre-test and post-test instruments were prepared to identify changes in understanding before and after the intervention. The evaluation also incorporated assessment of group discussions and presentations to examine participants' capacity to analyze AI-related educational cases and formulate appropriate solutions. A participant satisfaction questionnaire was used to obtain feedback concerning the implementation and perceived benefits of the program. Documentation, including attendance records, photographs, training materials, and group discussion outputs, provided additional evidence of program implementation.

The resulting information was analyzed using descriptive qualitative and simple descriptive quantitative approaches. Pre-test and post-test results were compared, while observations, group outputs, presentations, satisfaction responses, and learning reflections were interpreted collectively. The evaluation framework was designed not only to assess immediate learning outcomes but also to identify supporting factors, implementation constraints, and potential improvements for subsequent community engagement activities. The program established indicators including improved participant performance, completion of PBL cases, understanding of ethical AI principles, and the ability to formulate responsible AI recommendations for educational settings. This multidimensional evaluation was intended to connect the quality of program implementation with its capacity-building objectives.

IMPLEMENTATION OF THE FUTURE-READY LEADERSHIP PROGRAM

1. Developing Future-Ready Educational Leadership

The implementation of the Future-Ready Leadership Program began by positioning educational leadership as a strategic capability for navigating technological, organizational, and pedagogical change (Wibowo, Suhud, Utami et al., 2026). Rather than treating AI as an isolated technological innovation, the program framed it as part of a broader transformation in how educational institutions are led and managed. Participants were introduced to the Future School concept together with Strategic Educational Leadership, Leadership in VUCA Environment, VUCA Prime, Sensemaking, Mindful Leadership, Ethical Leadership, Distributed Leadership, Agile School Management, Future-ready School Culture, and Leadership Roadmap. This combination was intended to develop leaders who can interpret uncertainty, coordinate institutional responses, and maintain educational quality while responding to technological disruption (Sihotang, Suhud, Rizan, 2025). The approach reflects the growing recognition that AI adoption requires educational leaders to address implementation challenges, ethical questions, institutional

readiness, and organizational consequences simultaneously rather than focusing exclusively on technological functionality (Bellibas & Karaferye, 2026).

The leadership component was delivered through interactive lectures, presentations, discussions, reflection, and question-and-answer sessions. This format was selected to create opportunities for participants to connect leadership concepts with educational situations that may emerge within future-oriented schools. Strategic leadership was discussed in relation to long-term institutional direction, while VUCA-oriented leadership emphasized the capacity to respond to volatile, uncertain, complex, and ambiguous conditions (Pertiwi, Suhud, Wibowo et al., 2026). Mindful and ethical leadership introduced the importance of awareness, responsibility, integrity, and consideration of stakeholder consequences. Distributed leadership further broadened the leadership perspective by emphasizing collective participation rather than concentrating responsibility exclusively in formal positions (Merina, Suhud, Sihotang et al., 2026). These dimensions were complemented by Agile School Management, which encouraged participants to consider flexibility and responsiveness as organizational capabilities. Such an integrated approach corresponds with strategic perspectives on AI adoption that emphasize institutional alignment, inclusiveness, ethical governance, and sustainable innovation (Atef, 2025).

An important feature of the program was its emphasis on developing leadership judgment rather than simply increasing awareness of emerging technologies. Future-ready education leaders need to determine how technological innovations should be incorporated into institutional practices, what risks require mitigation, and how technological decisions should remain aligned with educational values. Accordingly, the program encouraged participants to consider leadership as a process of sensemaking and strategic response (Merina, Suhud, Sihotang et al., 2026). This orientation is particularly important because AI can affect institutional processes, professional responsibilities, student learning, and relationships between educators and learners. Educational leaders therefore need to establish organizational conditions that support innovation while protecting educational quality and stakeholder interests. Research on responsible AI integration similarly emphasizes that institutional leaders have an essential role in connecting technological implementation with pedagogical objectives, ethical principles, and organizational accountability.

The program also emphasized that future-ready leadership requires continuous professional development. Leadership competencies cannot be developed through a single exposure to technological information because AI systems, educational applications, institutional expectations, and associated ethical questions continue to evolve. Consequently, leaders need an ongoing capacity to learn, reassess existing practices, and guide others through technological change (Sihotang, Suhud, Handaru, 2025). The program's emphasis on leadership roadmap development reflected this need by encouraging participants to conceptualize future-oriented actions rather than viewing the training as a discrete event. This perspective is consistent with evidence that educators require structured professional development to build confidence and competence for AI-enhanced educational environments (Looi et al., 2026). The program therefore positioned leadership development as a continuing process of organizational learning rather than a

one-time acquisition of technical knowledge (Cholifah, Suhud, Sihotang et al., 2026).

2. Integrating AI Literacy, Responsible AI, and Educational Leadership

The second component integrated AI literacy directly into educational leadership development. Participants were introduced to AI applications that could support learning processes, preparation of instructional materials, assessment, and differentiated learning. However, the program deliberately avoided defining AI literacy as proficiency with a particular platform or application. Instead, participants were expected to understand both the opportunities and limitations of AI and to evaluate its implications before recommending institutional use. This approach recognizes AI literacy as a multidimensional competency involving awareness, ethical understanding, evaluation, and responsible application. Such dimensions are increasingly considered essential for enabling learners and educators to participate effectively in human-machine collaboration (Al-Abdullatif, 2025).

Responsible AI was consequently embedded within the leadership discussion. Participants examined privacy and personal-data protection, copyright, plagiarism, academic integrity, bias, transparency, accountability, and the boundaries of AI use by teachers and students. These issues were discussed not merely as individual user responsibilities but as institutional governance concerns requiring appropriate leadership responses. The program promoted a human-centered orientation in which AI could enhance educational professionals' effectiveness without replacing teachers as the primary decision-makers (Hernita, Hellyani, Arfiany et al., 2026). This distinction is important because responsible AI requires institutions to consider whether a technological application is educationally appropriate, ethically defensible, and equitable for different stakeholders. Current work on AI ethics in education similarly emphasizes the need to address ethical principles systematically when AI becomes embedded in educational practices (Pang et al., 2026).

The integration of AI literacy and leadership was further reinforced through the concept of institutional support. Participants were encouraged to consider how future education leaders could communicate expectations, establish boundaries, and support teachers and students in navigating AI adoption. This approach acknowledges that differences in AI knowledge can create uneven levels of confidence and potentially widen organizational capability gaps. Leadership must therefore create an environment in which AI-related learning is supported through guidance, discussion, professional development, and shared standards (Permana, Pramawati, Saputra et al., 2026). Rather than expecting individual educators to independently resolve emerging technological dilemmas, institutions require coordinated approaches to capacity development. The need to address AI knowledge disparities through institutional support has been highlighted as a central challenge in achieving meaningful and equitable AI literacy (Ngoveni, 2025).

The program consequently reframed AI literacy from an individual technical competency into an element of educational governance. Participants were expected to consider not only whether AI could perform a particular function but also whether its use was appropriate within a school's pedagogical, ethical, and organizational context. This required attention to human judgment, transparency, accountability, and stakeholder interests. Such an

approach is consistent with emerging frameworks that define AI literacy as a combination of awareness, knowledge, critical evaluation, responsible use, and the ability to interact productively with AI systems (Eskiadi & Panagiotou, 2025). The resulting perspective strengthens the connection between digital literacy and leadership because leaders become responsible for creating institutional environments in which AI is used purposefully rather than adopted simply because it is technologically available (Murti, Gunawan, Arifiansyah et al., 2026).

3. Problem-Based Learning and Policy-Oriented Recommendations

Problem-Based Learning (PBL) constituted the principal mechanism for translating the program's conceptual content into practical leadership reasoning. Following the interactive lectures, participants analyzed an authentic case concerning students' use of AI to complete school assignments (Saputra, Permana, Utami et al., 2026). They were required to identify the central problem, examine potential consequences, consider stakeholder interests, evaluate ethical and academic-integrity concerns, compare alternative responses, and formulate recommendations. The process transformed AI from an abstract technological subject into a concrete educational leadership problem. This was important because future-ready leaders need opportunities to exercise judgment under conditions that resemble the complexity of actual institutional decision-making. PBL has increasingly been recognized as a learning approach capable of connecting conceptual knowledge with contextualized problem-solving and collaborative inquiry (Veliverronena et al., 2025).

The PBL process also encouraged participants to move beyond identifying problems toward developing policy-oriented responses. Group outputs were directed toward principles or recommendations that could inform responsible AI use within school environments. This emphasis created a bridge between leadership education and institutional governance. Instead of asking only whether students should or should not use AI, participants considered questions concerning acceptable uses, academic integrity, teacher responsibilities, data protection, and institutional accountability. Such deliberation reflects the broader requirement for educational leaders to establish coherent frameworks for AI adoption rather than relying on informal or inconsistent practices. AI-supported decision-making therefore requires leaders to combine technological possibilities with institutional objectives, professional judgment, and clearly defined governance principles (Trejo-Macotela & Robles-Camarillo, 2025).

The group presentations and subsequent reflection provided an additional layer of collaborative learning. Participants had to communicate their reasoning, respond to alternative perspectives, and justify their recommendations (Indriani, Hamilah, Ridwan et al., 2026). This process reinforced the program's emphasis on distributed leadership because decision-making was constructed collectively rather than exclusively by instructors. It also provided an opportunity to identify differences in how participants interpreted technological benefits, ethical risks, and institutional responsibilities. The activity consequently connected critical thinking with leadership development and allowed participants to experience the negotiation involved in developing organizational responses to emerging technologies. The emphasis on student and emerging-leader development through collaborative engagement is particularly relevant in an AI environment where leadership

increasingly involves navigating complex relationships between technological systems, institutional structures, and human actors (Acheson, 2026).

Overall, the implementation demonstrated an integrated pathway from leadership concepts to AI literacy and finally to applied policy reasoning. The interactive lectures established a conceptual foundation, AI sessions developed awareness of responsible technological use, and PBL enabled participants to apply these competencies to an authentic educational dilemma. The sequence was deliberately designed to move participants from “understanding AI” toward “managing the use of AI” in educational contexts. The PKM report indicates that participants subsequently demonstrated stronger understanding of Future School, strategic and ethical leadership, responsible AI use, and case analysis, including the ability to formulate recommendations through PBL. This integrated model is particularly valuable for future-ready education because it recognizes that successful AI transformation depends not only on technological access but also on leadership capacity, ethical reasoning, institutional support, and the ability to translate emerging challenges into actionable organizational responses. Research on preparing educational leaders for the AI era similarly emphasizes the value of combining curriculum innovation with institutional inquiry to prepare leaders for complex technology-driven change (Stewart et al., 2026).

RESULTS AND DISCUSSION

1. Changes in Future School and Educational Leadership Understanding

The implementation of the program produced observable changes in participants’ understanding of Future School and educational leadership. Before the intervention, participants generally had familiarity with AI in education but demonstrated more limited understanding of Future School, strategic leadership, VUCA-oriented leadership, ethical leadership, and agile school management. Following the program, participants demonstrated broader conceptual understanding of how these leadership approaches could support educational institutions facing technological and organizational change. The change is important because Future School requires leaders to move beyond conventional administrative responsibilities toward adaptive leadership capable of responding to technological disruption, changing stakeholder expectations, and emerging educational needs. The program therefore treated leadership development as preparation for institutional transformation rather than simply preparation for managing existing school routines. Recent research similarly argues that AI is transforming educational leadership by requiring leaders to combine technological awareness with strategic, interpersonal, and organizational capabilities (Alkaabi et al., 2025).

The program’s leadership component was structured around several complementary perspectives, including Strategic Educational Leadership, Leadership in VUCA Environment, Sensemaking, Mindful Leadership, Ethical Leadership, Distributed Leadership, and Agile School Management. This combination enabled participants to view educational leadership as a multidimensional process involving interpretation, adaptation, collaboration, ethical judgment, and organizational responsiveness. Rather than presenting these approaches as independent theories, the activities connected them to the practical challenge of developing Future Schools that can continuously respond to changing environments.

The emphasis on leadership adaptation was particularly relevant because AI-driven transformation may alter institutional processes and professional roles faster than conventional management structures can accommodate. The resulting learning experience encouraged participants to understand leadership as an ongoing process of making sense of change and mobilizing people around appropriate institutional responses. This orientation is consistent with the emerging concept of Human-AI Leadership, which emphasizes the interaction between technological intelligence and human leadership capabilities in transforming schools (Abdallah et al., 2026).

An important outcome was the development of a more contextual understanding of leadership responsibility. Participants were encouraged to consider how leaders should respond when technological innovation creates competing educational, ethical, and organizational interests. For example, adopting an AI system may improve efficiency while simultaneously raising concerns about data protection, academic integrity, teacher autonomy, or unequal access. Consequently, future-ready leadership cannot be evaluated solely through the speed of technological adoption. It must also be assessed through the quality of institutional judgment, stakeholder engagement, and safeguards established around innovation. The program’s emphasis on strategic, ethical, mindful, distributed, and agile leadership provided participants with a conceptual basis for navigating such tensions. This orientation corresponds with research arguing that Human-AI leadership for schools requires leaders to retain human judgment while using technological capabilities to support institutional transformation (Ismail, 2026).

The observed change also has implications for the development of Future School culture. The program did not conceptualize future readiness merely as having access to digital technologies. Instead, future readiness was connected with the ability to establish an organizational culture that is innovative, collaborative, ethical, and capable of continuous learning. Participants were introduced to Future-ready School Culture and Leadership Roadmap concepts, allowing leadership development to be connected with longer-term organizational planning. Such an approach is particularly important because technological transformation becomes sustainable only when it is embedded in institutional culture, professional practice, and collective expectations. The program therefore contributed to a shift from viewing future readiness as a technological condition toward understanding it as an organizational and leadership capability. This interpretation is compatible with evidence that AI and digital learning are redefining leadership by requiring educational institutions to reconsider how leadership, learning, and digital transformation are interconnected (Areba et al., 2024).

2. Strengthening AI Literacy and Ethical Decision-Making

The second major outcome concerned the strengthening of AI literacy. Participants initially possessed general awareness of AI but had less comprehensive understanding of its educational applications and associated risks. After the intervention, participants demonstrated greater awareness of how AI could support instructional preparation, assessment, differentiated learning, and other educational activities while recognizing the need for responsible use. The program intentionally avoided reducing AI literacy to operational proficiency with specific tools. Instead, participants were encouraged to understand AI capabilities and limitations and to evaluate its educational relevance before

determining how it should be used. This broader conception is important for future education leaders because institutional decisions require more than knowing how a technology works; leaders must determine whether its use contributes meaningfully to educational objectives. AI literacy has increasingly been associated with responsible participation in digital environments, particularly where knowledge of technology must be combined with awareness of ethics, privacy, and social consequences (Bhavana et al., 2025).

Ethical decision-making was embedded directly into the AI learning process. Participants examined privacy and personal-data protection, copyright, plagiarism, academic integrity, algorithmic bias, transparency, and accountability. These issues were considered in relation to the responsibilities of teachers, students, school leaders, and institutions rather than treated as isolated technical concerns. This approach encouraged participants to recognize that AI implementation can generate trade-offs between efficiency and educational values. For example, an AI-supported process may reduce workload but introduce risks if its outputs are accepted without critical evaluation. Similarly, AI-based personalization may offer instructional benefits while creating concerns about data collection and unequal technological access. The program consequently encouraged participants to evaluate AI through both benefit-oriented and risk-oriented perspectives. Such an approach corresponds with contemporary frameworks that connect AI literacy with ethical governance and sustainable development, emphasizing responsible use, human agency, and institutional accountability (Islam et al., 2026).

The program also strengthened the connection between AI literacy and leadership judgment. Participants were not simply asked to identify potential risks but were required to consider appropriate responses to those risks. This distinction is significant because knowledge of ethical principles does not automatically produce ethical decision-making. Leaders need opportunities to interpret principles within concrete institutional situations, balance competing interests, and formulate actionable responses. The case-based activities therefore created an environment in which participants could practice translating abstract concerns such as privacy, bias, and academic integrity into practical recommendations for school contexts. This process helped establish AI literacy as a leadership competency rather than merely a digital skill. The emphasis is consistent with emerging educational approaches that identify awareness, evaluation, ethical understanding, and responsible use as interconnected components of meaningful AI competency (Assayed & Assayed, 2025).

The findings further indicate that responsible AI requires institutional rather than exclusively individual responses. Participants were encouraged to consider the importance of school-level policies and boundaries governing AI use. This perspective is relevant because inconsistent practices among teachers and students can create uncertainty regarding acceptable AI use, particularly in assessment and academic work. Future-ready leaders therefore need to establish clear expectations while allowing sufficient flexibility for pedagogical innovation. The program's focus on responsible AI recommendations helped participants recognize that leadership involves creating governance structures that protect educational integrity while enabling productive experimentation. Such institutionalization of ethical principles is increasingly viewed as necessary for establishing trustworthy AI environments in education, particularly with regard

to fairness, transparency, accountability, and human oversight (Kumar & Ghosh, 2025).

3. Effectiveness of PBL and International Community Engagement

Problem-Based Learning was particularly valuable in translating conceptual knowledge into practical leadership capabilities. Participants worked with an authentic case involving students' use of AI to complete school assignments and were required to identify problems, examine ethical and academic-integrity implications, consider stakeholder perspectives, evaluate alternative solutions, and formulate recommendations. The activity therefore required participants to integrate educational leadership, AI literacy, and ethical reasoning within a single decision-making process. Rather than receiving predetermined answers, participants had to justify their positions and negotiate possible responses collectively. The program report indicates that participants subsequently demonstrated stronger abilities to analyze AI-related cases, develop alternatives, and formulate recommendations for responsible AI use in schools. Recent cross-national evidence also indicates that problem- and project-based learning can contribute to student engagement, academic development, and character formation across different educational contexts (Hakim et al., 2025).

The effectiveness of PBL was further supported by the collaborative structure of the activity. Group discussion and presentation required participants to articulate their reasoning and respond to different perspectives, creating opportunities for communication, negotiation, and collective problem-solving. These capabilities are highly relevant to educational leadership because institutional decisions concerning AI rarely involve a single stakeholder or a single objective. Leaders must communicate with teachers, students, administrators, parents, and other institutional actors whose interests may differ. PBL therefore provided a practical environment for rehearsing the collaborative dimensions of leadership. Its contribution extended beyond knowledge acquisition toward the development of decision-making processes that resemble the complexity of real educational governance. The program's design is consistent with the argument that PBL can function as a professional development mechanism through which participants engage actively with complex problems rather than merely receiving information (Kraft-Terry & Wiebe, 2023).

The international dimension added another layer to the community engagement process. The collaboration between UNJ and UTHM created opportunities for exchanging experiences and perspectives between Indonesian and Malaysian academic contexts. This collaboration was not treated as the sole source of program novelty but as an enabling context for knowledge exchange and the development of future cooperation in education, research, and community engagement. Such international interaction is relevant to future-ready leadership because educational challenges associated with AI are not confined to one national context. Leaders increasingly operate within interconnected educational environments in which technological developments, professional practices, and policy discussions cross institutional and national boundaries. Carter (2022) emphasizes that community engagement can contribute to leadership development by creating platforms through which emerging leaders build relationships, experience collaborative responsibility, and develop leadership capacities through engagement with broader communities.

Overall, the results demonstrate that the program's strongest contribution was the integration of three mutually reinforcing dimensions: future-ready educational leadership, responsible AI literacy, and applied problem-solving. Leadership concepts provided the organizational framework, AI literacy supplied the technological and ethical knowledge, and PBL provided a mechanism for applying both dimensions to realistic educational dilemmas. International community engagement further expanded the learning environment by connecting participants with an academic collaboration that crossed institutional and national boundaries. The resulting model moved beyond conventional technology training toward leadership capacity building, in which participants were prepared not simply to use AI but to evaluate, govern, and communicate its responsible use within educational institutions. The program's documented outcomes—including improved understanding of Future School, strategic and ethical leadership, responsible AI, and AI-related case analysis—support its value as a practical model for preparing future-ready education leaders. This integrated orientation is increasingly important as educational institutions seek to combine digital transformation with effective leadership and inclusive institutional development.

CONCLUSION

1. Summary

The Community Engagement Program at Johor Business School, Universiti Tun Hussein Onn Malaysia, demonstrated the relevance of integrating educational leadership, Artificial Intelligence (AI) literacy, and digital literacy in preparing future-ready education leaders. The program was designed in response to the increasing complexity of educational transformation, where leaders are expected not only to manage institutional operations but also to guide technological adoption, support innovation, and maintain ethical standards. Through interactive lectures, discussions, reflection, Problem-Based Learning (PBL), group presentations, and case analysis, participants were introduced to Future School concepts and a range of leadership approaches, including Strategic Educational Leadership, VUCA Leadership, Mindful Leadership, Ethical Leadership, Distributed Leadership, and Agile School Management.

The implementation also positioned AI as an issue of educational leadership rather than merely a technological tool. Participants explored opportunities for AI in learning, instructional preparation, assessment, and differentiated learning while simultaneously examining privacy, copyright, plagiarism, academic integrity, bias, transparency, and accountability. The PBL component provided an opportunity to apply these concepts to an authentic case involving AI use in school assignments. The program report indicates improvements in participants' understanding of Future School, educational leadership, responsible AI use, and their ability to analyze cases and formulate recommendations. Thus, the program contributed to developing a more integrated understanding of leadership in technology-mediated educational environments.

2. Practical Implications for Future-Ready Education Leadership

The program offers several practical implications for the development of future-ready education leaders. First, leadership development should integrate technological literacy with strategic, ethical, and organizational competencies. AI literacy should not be limited to learning how to operate AI applications but should

include the ability to evaluate AI outputs, recognize limitations, assess risks, and determine appropriate institutional applications. Future education leaders therefore need to become capable of making informed decisions about when AI can enhance educational practices and when human judgment must remain central.

Second, educational institutions can adopt PBL as a practical mechanism for developing leadership competencies. Authentic cases allow participants to move beyond theoretical understanding and practice problem identification, stakeholder analysis, risk assessment, collaborative decision-making, and policy formulation. In the present program, participants were required to analyze AI-related educational problems and formulate responsible recommendations, creating a direct connection between leadership knowledge and institutional decision-making. The documented program outcomes indicate that participants developed stronger abilities to analyze cases and formulate recommendations for AI use in school environments.

Third, educational leaders should treat responsible AI as part of institutional governance. Schools require clear principles concerning academic integrity, privacy, data protection, copyright, transparency, and appropriate AI use. Future-ready leadership therefore involves creating organizational cultures in which technological innovation is encouraged while ethical boundaries remain explicit. This approach can help institutions avoid both uncritical technology adoption and excessive resistance to technological change.

3. Sustainability, Limitations, and Future Community Engagement

The sustainability of the program can be strengthened through continued collaboration between UNJ and UTHM. Future activities may include advanced training, digital teaching materials, follow-up workshops, collaborative research, and additional community engagement programs focusing on educational leadership and responsible AI. The existing program provides a foundation for these activities because the partnership has already created opportunities for knowledge exchange and institutional collaboration.

Nevertheless, several limitations should be acknowledged. The documented outcomes primarily describe changes in understanding, participation, case-analysis ability, and perceived competency. The available report does not provide detailed statistical evidence sufficient to establish long-term effects or causal relationships. Future programs should therefore incorporate more systematic pre-test and post-test measurements, follow-up assessments, and longitudinal evaluation to determine whether newly developed competencies are transferred into actual educational leadership practices.

Future community engagement should consequently move from short-term capacity building toward sustained professional development. A continuing UNJ-UTHM program could develop an AI leadership curriculum, establish an educational AI governance framework, and provide mentoring for participants as they apply responsible AI practices in educational settings. Such continuity would transform the community engagement initiative from a single intervention into a sustainable capacity-building model for developing education leaders who are adaptive, ethically grounded, digitally literate, and prepared to lead educational transformation.

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