PREPARING FUTURE PROJECT LEADERS FOR THE AI ERA

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Abstract - Artificial Intelligence (AI) is increasingly transforming professional practice and higher education. As AI-enabled tools become more prevalent in planning, decision-making, risk management, stakeholder engagement, and organisational leadership, higher education must evolve to prepare graduates for AI-enabled workplaces. While existing research has examined AI adoption in higher education and professional practice, limited attention has been given to how educational programs should develop AI literacy, critical evaluation skills, governance awareness, and effective human-AI collaboration.

This paper proposes a Human-Centred AI Project Management Education Framework comprising five progressive stages: AI Awareness, AI-Assisted Learning, Critical Evaluation, Human-AI Collaboration, and Professional Practice. The framework integrates principles of AI literacy, responsible AI governance, and competency development to support the systematic incorporation of AI into leadership and project management education.

The framework is illustrated through a postgraduate teaching case study involving project management students who used Generative AI to support project charter development, stakeholder analysis, risk management, and project reporting. The findings demonstrate that AI can enhance learning when used to augment, rather than replace, professional judgement and critical thinking. The paper contributes a practical framework for educators seeking to prepare future project leaders for increasingly AI-enabled organisational environments while preserving the human-centred capabilities essential for professional success.

Keywords - Artificial Intelligence, Project Management Education, AI Literacy, Human-AI Collaboration, Educational Innovation.

I. INTRODUCTION

Artificial Intelligence (AI) is rapidly transforming professional practice across industries, including project management. Advances in machine learning, predictive analytics, natural language processing, and Generative AI are increasingly being applied to project planning, scheduling, resource allocation, risk management, stakeholder engagement, reporting, and decision-making [1]. As organisations adopt AI-enabled tools and platforms, project managers are expected to develop new competencies that extend beyond traditional project management methods and processes [1].

The growing influence of AI on project delivery has been recognised by the Project Management Institute (PMI), which identifies AI as a significant driver of change within the profession [1]. AI technologies are increasingly being used to automate routine project activities, improve forecasting accuracy, support risk identification, and enhance data-driven decision-making [1]. At the same time, successful project delivery continues to depend upon human-centred capabilities such as leadership, communication, stakeholder engagement, strategic thinking, and professional judgement [1]. Consequently, project professionals must learn to work effectively with AI while maintaining accountability for project outcomes.

Higher education institutions are also confronting the implications of AI adoption. Generative AI tools such as ChatGPT have transformed how students access information, generate content, and complete learning activities [2], [3]. While AI offers opportunities to enhance learning, personalisation, and student support, it has also raised concerns regarding academic integrity, assessment validity, critical thinking, and the future role of educators [4], [6], [7]. These developments have prompted universities to reconsider how AI should be incorporated into curriculum design and assessment practices [4].

Although a growing body of research has examined AI adoption in higher education and the use of AI within project management practice, relatively little attention has been given to how project management education should evolve to prepare graduates for AI-enabled workplaces [2], [3], [5]. Existing studies largely focus either on AI as an educational technology or AI as a project management tool, with limited consideration of how future project managers can develop AI literacy, critical evaluation skills, ethical awareness, governance capability, and effective human-AI collaboration [4], [8].

This paper addresses this gap by proposing a Human-Centred AI Project Management Education Framework. Drawing upon literature relating to AI in higher education, AI literacy, responsible AI governance, and project management competency development [4], [8], [9], [10], the framework comprises five progressive stages: AI Awareness, AI-

Assisted Learning, Critical Evaluation, Human-AI Collaboration, and Professional Practice. The framework is illustrated through a teaching case study involving postgraduate project management students and demonstrates how AI can be integrated into project management education while preserving professional judgement, leadership capability, ethical awareness, and governance responsibility.

The paper contributes to both project management education and educational innovation by providing a structured approach for preparing future project leaders to operate effectively in increasingly AI-enabled organisational environments.

II. LITERATURE REVIEW

A. Artificial Intelligence in Higher Education

Artificial Intelligence (AI) is increasingly influencing teaching, learning, assessment, and student support within higher education. Early applications focused on intelligent tutoring systems, learning analytics, adaptive learning platforms, and automated assessment, while recent developments have been dominated by Generative AI technologies such as ChatGPT [2], [3]. Research suggests that AI can enhance personalised learning, improve accessibility, support curriculum development, and provide timely feedback to students [2], [3], [7].

Generative AI has further expanded these capabilities by enabling the creation of learning materials, case studies, project artefacts, and assessment resources. Studies indicate that AI can support student engagement and self-directed learning while reducing administrative workload for educators [7], [12]. Studies examining student use of Generative AI indicate that students frequently employ AI for brainstorming, drafting, summarisation, and learning support activities [12], [13]. However, AI adoption has also raised concerns regarding academic integrity, assessment validity, student overreliance on AI-generated content, and the potential erosion of critical thinking skills [4], [5], [6].

Consequently, many scholars argue that higher education should move beyond simply permitting or restricting AI use and instead focus on developing students' ability to use AI responsibly and critically within professional and academic contexts [4], [5].

B. AI Literacy, Governance and Educator Concerns

As AI becomes increasingly embedded within society and professional practice, AI literacy has emerged as an essential graduate capability. AI literacy extends beyond technical understanding to include critical evaluation of AI-generated outputs, awareness of ethical and governance issues, and the ability to exercise informed judgement when interacting with AI systems [4], [8].

The literature consistently identifies challenges associated with bias, transparency, privacy, intellectual property, accountability, and misinformation. Generative AI systems may produce inaccurate or misleading outputs while presenting information with a high degree of confidence [4], [5]. Consequently, responsible AI frameworks developed by UNESCO, the OECD, NIST, and ISO emphasise human oversight, transparency, fairness, accountability, and ethical decision-making [4], [8], [9], [10].

Educators have similarly expressed concerns regarding the impact of AI on assessment, student learning, and academic integrity. Recent studies suggest that assessment approaches should increasingly focus on authentic learning, critical reflection, professional judgement, and evaluation of reasoning processes rather than solely assessing final outputs [6], [11]. These findings highlight the need for educational approaches that prepare students to collaborate effectively with AI while maintaining responsibility for decisions and outcomes.

C. AIand Project Management Competencies

AI is also transforming project management practice. The Project Management Institute (PMI) identifies AI as a significant force influencing project planning, forecasting, risk management, stakeholder communication, reporting, and portfolio management [1]. AI-enabled tools are increasingly supporting project teams through automation and data-driven decision-making.

Despite these advances, PMI emphasises that AI should augment rather than replace project professionals. Leadership, communication, stakeholder engagement, negotiation, ethical judgement, and strategic thinking remain fundamental human capabilities that underpin successful project delivery [1]. Consequently, future project managers require not only technical knowledge of AI tools but also the ability to evaluate AI-generated recommendations, understand associated risks, and exercise professional judgement within AI-enabled environments.

While the literature has examined AI adoption in higher education and the growing role of AI in project management practice, limited research has explored how project management education should systematically prepare students for these emerging professional realities. Existing studies primarily focus either on AI as an educational technology or AI as a project management tool [1]–[5]. Few studies provide a structured educational framework that integrates AI literacy, critical evaluation, governance awareness, human-AI collaboration, and professional practice

within project management curricula.

This gap provides the basis for the Human-Centred AI Project Management Education Framework proposed in the next section.

III. HUMAN-CENTRED AI PROJECT MANAGEMENT EDUCATION FRAMEWORK

The literature review highlights two important trends. First, Artificial Intelligence is increasingly influencing both higher education and project management practice [1]–[5]. Second, future project professionals require more than technical AI skills; they must be capable of critically evaluating AI-generated outputs, understanding governance and ethical implications, and exercising professional judgement within AI-enabled environments [4], [8], [9], [10]. Despite growing interest in AI adoption, limited research has proposed structured educational models specifically designed for project management education.

To address this gap, this paper proposes a Human-Centred AI Project Management Education Framework comprising five progressive stages. The framework integrates AI literacy, responsible AI governance, experiential learning principles, and project management competency development [4], [8], [9], [10], [14]. Its objective is to prepare graduates to work effectively with AI while maintaining accountability for project decisions, stakeholder relationships, and organisational outcomes.

Stage	Purpose	Example Learning Activities	Primary Competencies Developed
AI Awareness	Develop foundational understanding of AI capabilities, limitations, risks and governance issues	AI ethics discussions, AI case studies, analysis of AI failures and successes	AI literacy, ethical awareness, governance understanding
AI-Assisted Learning	Introduce AI as a learning and productivity tool	AI-generated project charters, stakeholder registers, risk analyses and project plans	AI utilisation, digital capability, productivity enhancement
Critical Evaluation	Develop the ability to assess AI-generated outputs	Comparing AI and student-generated artefacts, identifying errors, omissions and bias	Critical thinking, analytical reasoning, professional judgement
Human-AI Collaboration	Enable effective collaboration between human expertise and AI recommendations	AI-supported decision-making, stakeholder analysis and project simulations	Leadership, decision-making, communication and accountability
Professional Practice	Apply AI within authentic project environments	Capstone projects, industry case studies, governance and risk assessments	Professional practice, governance, strategic thinking and ethical leadership

Table I - Human-Centred AI Project Management Education Framework

The framework is designed as a developmental model in which students progressively advance from understanding AI concepts to applying AI within realistic project environments. The first stage establishes foundational AI literacy and awareness of governance and ethical considerations. The second stage introduces AI as a practical learning support tool, enabling students to experience how AI can enhance project management activities.

The third stage represents a critical transition by requiring students to evaluate and challenge AI-generated outputs rather than accepting them uncritically. Building on this capability, the fourth stage focuses on human-AI collaboration, emphasising that AI should support rather than replace professional judgement. The final stage integrates AI into authentic project scenarios where students must balance technical, organisational, ethical, and governance considerations.

The framework aligns closely with the PMI Talent Triangle. AI Awareness contributes primarily to Business Acumen through understanding digital transformation and emerging technologies. AI-Assisted Learning strengthens Ways of Working through practical application of AI within project processes. Critical Evaluation develops Power Skills such as critical thinking and decision-making. Human-AI Collaboration reinforces leadership, communication, and stakeholder engagement capabilities, while Professional Practice integrates all three dimensions within realistic project environments [1].

Unlike technology-centric approaches that focus primarily on AI tool usage, the proposed framework emphasises human judgement, accountability, ethical reasoning, governance oversight, and leadership development. The framework therefore provides a structured approach for integrating AI into project management curricula while preserving the human-centred capabilities that remain essential for successful project delivery.

IV. CASE STUDY AND FRAMEWORK APPLICATION

To demonstrate the practical application of the Human-Centred AI Project Management Education Framework, the framework was implemented within a postgraduate Project Management subject at an Australian higher education institution. The class consisted of 11 students and was designed to explore how Generative AI could be incorporated into project management education while maintaining a strong emphasis on critical thinking, professional judgement, ethical awareness, and governance responsibility.

The implementation aligned learning activities with the five stages of the framework. Students were first introduced to AI concepts, capabilities, limitations, and governance considerations through discussions of AI literacy, ethics, and responsible AI use [4], [8], [9], [10]. AI was then incorporated into project management activities including project charter development, stakeholder analysis, risk management, and project reporting.

A key feature of the approach was that students were required to complete project tasks independently before generating AI-assisted alternatives. Students then compared and evaluated AI-generated outputs against their own work, identifying strengths, weaknesses, omissions, assumptions, and contextual limitations. This approach encouraged students to view AI as a decision-support tool rather than a substitute for professional judgement, consistent with recommendations for responsible AI adoption in higher education [4], [5].

One learning activity involved the development of project charters for a digital transformation initiative. Students initially prepared project charters manually and subsequently generated alternative versions using Generative AI tools. Comparative analysis revealed that AI-generated outputs often demonstrated strong structure and completeness but frequently lacked organisational context, stakeholder sensitivity, and realistic project assumptions. The exercise reinforced the importance of critical evaluation and contextual understanding during project initiation and planning.

A similar approach was applied to project risk management. Students developed risk registers independently before using AI to generate additional risk analyses. While AI effectively identified common project risks and mitigation strategies, students observed that organisational culture, stakeholder dynamics, project history, and contextual constraints were often underrepresented. These findings highlighted the continuing importance of human oversight in project decision-making and reflected broader concerns regarding the limitations of AI-generated recommendations [4], [5].

The framework was also applied to stakeholder engagement and project reporting activities. Students used AI to generate communication plans, stakeholder strategies, and project reports before evaluating the suitability of these outputs for specific project contexts. Such activities demonstrated that while AI can improve efficiency and provide valuable insights, successful project outcomes continue to depend on leadership, communication, negotiation, and stakeholder management capabilities [1].

Informal classroom observations suggested that students valued the opportunity to compare their own work with AI-generated alternatives and that the activities stimulated discussion regarding governance, ethics, accountability, and professional responsibility. The exercises also reinforced the importance of transparency in AI use and encouraged students to critically evaluate AI-generated recommendations rather than accept them uncritically [4], [8].

The case study demonstrates that AI can enhance project management education when used to augment, rather than replace, human learning and professional judgement. By progressively developing AI literacy, critical evaluation skills, human-AI collaboration capabilities, and governance awareness, the framework provides a practical approach for preparing future project leaders for increasingly AI-enabled professional environments.

V. DISCUSSION AND IMPLICATIONS

The findings suggest that project management education must evolve in response to the growing integration of Artificial Intelligence within professional practice. As AI increasingly supports project planning, forecasting, reporting, risk management, and stakeholder analysis, project managers require competencies that extend beyond traditional project management methodologies. Future project professionals must be capable of working effectively with AI systems while maintaining accountability for decisions, stakeholder relationships, and project outcomes [1].

The proposed Human-Centred AI Project Management Education Framework addresses this challenge by integrating AI literacy, critical evaluation, human-AI collaboration, governance

awareness, and professional practice into a progressive learning model. Rather than treating AI as a standalone technical topic, the framework embeds AI capabilities within existing project management competencies and aligns closely with emerging expectations regarding AI literacy and responsible AI use [4], [8].

The framework also has important implications for curriculum design. AI should not be confined to a single subject or elective topic but embedded throughout project management programs. Students should progressively develop their ability to understand AI capabilities, evaluate AI-generated outputs, collaborate with AI systems, and apply professional judgement within authentic project environments. Such an approach better reflects the realities of contemporary project practice and supports the development of future-ready graduates.

Assessment design represents another significant implication. The widespread availability of Generative AI challenges traditional approaches that rely primarily on written assignments and project artefacts. Consistent with recent higher education research, the framework supports a shift towards authentic assessment strategies that emphasise critical evaluation, reflection, decision-making processes, professional judgement, and demonstration of reasoning [6], [11]. By focusing on how students use, evaluate, and govern AI-generated outputs, assessment can remain relevant while encouraging responsible AI use.

Finally, the framework highlights the continuing importance of governance, ethics, and human oversight. Although AI can enhance productivity and support decision-making, responsibility for project outcomes remains with project professionals. Consequently, project management education should continue to emphasise leadership, stakeholder engagement, communication, ethical decision-making, and accountability. These human-centred capabilities are likely to become increasingly important as AI assumes a larger role in project delivery [1], [9], [10].

While the framework is conceptual and has been illustrated through a small postgraduate case study, it provides a practical foundation for integrating AI into project management education. Future research should evaluate its effectiveness across different educational contexts, student cohorts, and project management disciplines.

VI. CONCLUSION

Artificial Intelligence is transforming both project management practice and higher education, creating opportunities and challenges for educators preparing future project professionals [1]. As AI becomes increasingly embedded within project planning, risk management, reporting, forecasting, and decision-making, project managers require capabilities that extend beyond technical proficiency to include critical thinking, governance awareness, ethical judgement, and effective human-AI collaboration [1], [8].

This paper addressed the limited research on how project management education should respond to these developments by proposing a Human-Centred AI Project Management Education Framework. The framework comprises five progressive stages—AI Awareness, AI-Assisted Learning, Critical Evaluation, Human-AI Collaboration, and Professional Practice—and provides a structured approach for integrating AI into project management curricula.

The framework was illustrated through a postgraduate teaching case study that demonstrated how AI can be incorporated into project management learning while maintaining a strong emphasis on professional judgement, leadership, accountability, and responsible decision-making. The findings suggest that AI should be viewed as a tool that augments, rather than replaces, project professionals and that project management education must focus on developing graduates who can critically evaluate and responsibly govern AI-enabled project environments [1], [9], [10].

By integrating AI literacy with project management competencies, the proposed framework offers educators a practical approach for preparing future project leaders to succeed in increasingly AI-enabled organisations while preserving the human-centred capabilities that remain fundamental to project success [1], [8].

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