

# The Future of Professional Teachers: New Roles of Teachers in The AI Transition Era

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**ABSTRACT** : The rapid advancement of Artificial Intelligence (AI) has brought about significant transformations in educational systems worldwide, encompassing learning management, assessment and evaluation, as well as the role of teachers as educational practitioners. This academic article aims to synthesize knowledge regarding the new roles of professional teachers within the context of the AI transition era, drawing upon conceptual frameworks and scholarly literature from international organizations, as well as contemporary research and teacher competency standards. The synthesis reveals that teachers' roles have shifted from knowledge transmitters to learning designers, facilitators of personalized learning, data-informed practitioners, ethical overseers of AI utilization, and leaders of educational change. The competencies teachers must further develop include AI literacy, the ability to integrate AI with pedagogical science, the capacity to design learner-centered learning experiences, the use of data to support educational decision-making, and the cultivation of awareness regarding ethics, transparency, and accountability in technology use. The article further argues that, although AI can support teachers' work in numerous ways, it cannot replace the essential qualities of teacherhood — namely, the capacity to inspire, to foster moral development, to address individual differences, and to build human relationships. Therefore, future teacher development should aim to integrate professional competencies, digital competencies, and AI competencies, while upholding the core values of the teaching profession, in order to deliver effective education that is responsive to the evolving digital society and capable of supporting lifelong learning among twenty-first century learners.

**KEYWORDS** – professional teachers; artificial intelligence; future teacher competencies

## I. INTRODUCTION

In Over the past decade, the development of Artificial Intelligence (AI) has brought about rapid transformation across all sectors of society, particularly in education, which has been profoundly affected by the application of AI technologies in learning management, learner data analysis, assessment and evaluation, as well as educational institution administration. Generative AI technologies such as ChatGPT, Gemini, and Copilot have expanded access to knowledge and supported the creation of diverse learning materials, resulting in teachers' roles

no longer being confined to the transmission of knowledge, but requiring a shift toward becoming designers of learning experiences, facilitators of personalized learning, and developers of essential skills for life in the twenty-first century. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has highlighted that AI holds the potential to enhance the quality of education, expand opportunities for personalized learning, and support teachers' decision-making through the use of analytical data. Nevertheless, the integration of AI into educational systems also brings with it challenges related to ethics, transparency, data privacy, digital inequality, and the preservation of teachers' roles as developers of human beings. The application of AI in education should therefore be grounded in human-centered principles, alongside the strengthening of teachers' competencies to enable effective and responsible AI use (UNESCO, 2021, 2024).

The transition into the AI era has prompted a reconceptualization of the "professional teacher" — shifting from an emphasis on pedagogical knowledge and subject-matter expertise toward competency in integrating digital technology, artificial intelligence, and learning management that is appropriately responsive to learner diversity. The European Framework for the Digital Competence of Educators (DigCompEdu) proposes that teachers in the modern era should possess competencies spanning professional development, the use of digital resources, learning design, assessment, learner empowerment, and the promotion of learners' digital capabilities. Meanwhile, the UNESCO AI Competency Framework for Teachers (2024) has extended this scope to encompass AI literacy, ethical AI use, AI-integrated learning design, and the preparation of learners to coexist with technology in an informed and critical manner. Both frameworks reflect the understanding that teachers of the future must develop new knowledge, skills, and attributes aligned with the context of technological change — going beyond a mere focus on the use of digital tools in the classroom (Redecker, 2017; UNESCO, 2024).

Although AI can effectively support teachers' work across various dimensions — including content creation, assignment grading, learning outcome analysis, and learning activity design — the core values of the teaching profession remain grounded in the capacity to inspire, to cultivate moral and ethical development, to foster critical thinking, and to build positive relationships with learners; dimensions that technology cannot fully replicate. McEwan (2002) argues that effective teachers are not measured solely by their ability to transmit knowledge, but also by their leadership, understanding of learners, capacity to motivate, and commitment to continuous self-development. These attributes remain at the heart of professional teacherhood, even as the context of educational provision undergoes profound change. Teacher development in the AI era should therefore not focus exclusively on enhancing technological skills, but should cultivate the capacity to harness AI in ways that elevate learner learning, while simultaneously upholding human values and the ethical standards of the teaching profession (McEwan, 2002).

In the context of Thailand, the advancement of digital education policy and teacher competency development has proceeded continuously, with the Office of the Basic Education Commission having established a digital competency framework for teachers and educational personnel, aimed at elevating teachers' capacity to utilize digital technology in learning management and professional development. However, the rapid pace of AI advancement means that digital competency alone may no longer be sufficient, if teachers are unable to understand the principles underlying AI systems, evaluate the reliability of AI-generated outputs, use AI ethically, and design learning that appropriately integrates human–AI collaboration. Future teacher development should therefore expand from the concept of Digital Competency toward AI Competency — integrating professional knowledge, technology, ethics, and lifelong learning into a unified whole. This article thus aims to synthesize knowledge regarding the new roles of professional teachers in the context of the AI transition era, to analyze the competencies teachers must develop, and to propose directions for teacher development that will enable effective professional practice within the digital society and amid the technological transformations of the future (Office of the Basic Education Commission, 2024; UNESCO, 2024).

## **II. The Role of Professional Teachers in the Context of the AI Transition Era**

The rapid development of artificial intelligence has significantly transformed the educational landscape, necessitating a shift in the role of professional teachers from the traditional paradigm of Knowledge Transmission

toward becoming Learning Experience Designers who are responsive to the individual needs, interests, and potential of each learner. AI technology enables learners to access knowledge rapidly from diverse sources, thereby repositioning teachers' value — not as possessors of knowledge, but as those who help learners interpret, analyze, evaluate, and critically apply information. UNESCO (2021) asserts that AI should be used to support human learning rather than to replace the role of teachers, who remain central to defining learning objectives, designing activities that promote higher-order thinking, and cultivating desirable learner characteristics. At the same time, the UNESCO AI Competency Framework for Teachers (2024) proposes that teachers in the AI era must be capable of understanding the operational principles of AI systems, assessing their limitations, selecting appropriate tools for specific learning contexts, and overseeing AI use in accordance with principles of ethics, transparency, and accountability toward learners. Furthermore, the DigCompEdu framework highlights that teachers should be able to integrate digital technology appropriately into learning management, assessment, and learner development processes — with emphasis placed on using technology to elevate the quality of learning, rather than adopting it merely for the sake of modernity (Redecker & Punie, 2017; Sukanya, 2026)

Within this context, professional teachers must enact a new role as Facilitators of learning — creating learning environments that afford learners the opportunity to pursue knowledge independently, using AI as a tool to support learning rather than relying solely on system-generated answers. Teachers must encourage learners to ask questions, evaluate the credibility of information, compare sources, and apply reasoned judgment in decision-making — competencies that are central to twenty-first century learning. Beyond their role in learning management, teachers must also serve as Coaches and Mentors who provide guidance, support, and individualized monitoring of learner progress, drawing on data from AI Learning Analytics systems to analyze each learner's advancement and to design activities or interventions that are precisely matched to individual potential and limitations. The purpose of utilizing such data is not to control learners, but to support Personalized Learning — an approach recognized as a cornerstone of education in the digital era. Simultaneously, teachers must act as cultivators of a learning culture that promotes collaboration, the exchange of ideas, and cooperative learning among students, ensuring that AI serves as a learning assistant while human beings remain at the center of knowledge construction, communication, and social skill development. This vision aligns with the digital competency framework of the Office of the Basic Education Commission, which emphasizes teachers' capacity to use digital technology in learning management, assessment, and continuous professional development, as well as to encourage learners to use technology creatively and safely (Office of the Basic Education Commission, 2024).

Although artificial intelligence can create learning materials, analyze data, and support teachers' professional tasks with considerable effectiveness, the dimensions of the teaching profession that reflect its true vocational nature remain beyond what technology can fully replicate — namely, the capacity to inspire, to instill values, moral principles, and ethical sensibility, to understand the emotional and social contexts of learners, and to cultivate relationships that are conducive to learning. McEwan (2002) argues that effective teachers are not those with subject-matter knowledge alone, but must also be professional leaders, motivators, visionaries, and committed practitioners of continuous self-development. These attributes remain of paramount importance in the AI era, as learners require holistic development encompassing intellectual, emotional, social, and moral dimensions in tandem. The professional teacher of the future is therefore not a competitor to AI, but a critical collaborator with AI — leveraging the potential of technology to enhance the effectiveness of learning management, while preserving those distinctly human qualities of compassion, empathy, adaptability, and ethical judgment that constitute the foundation of the teaching profession and serve as essential factors in developing learners into quality citizens of the digital society. The transition into the AI era is thus not a diminishment of teachers' significance, but an elevation of their role — from transmitters of knowledge to Educational Change Leaders capable of integrating professional knowledge, technology, and human values to create learning that is high-quality, sustainable, and responsive to the transformations of the future world (McEwan, 2002; UNESCO, 2024).

### III. NEW COMPETENCIES OF PROFESSIONAL TEACHERS IN THE AI ERA

The transition into the age of artificial intelligence has not merely altered the tools or methods of learning management; it has also necessitated a comprehensive review and elevation of the professional competency framework for teachers to align with the educational context of the future. Whereas teacher development has traditionally emphasized Content Knowledge, Pedagogical Knowledge, and Technological Knowledge within the TPACK framework, teachers today must additionally develop AI Competency in order to collaborate with AI systems effectively and responsibly. UNESCO (2024) has proposed a multidimensional AI competency framework for teachers encompassing: foundational knowledge of AI; the selection of AI tools appropriate to learning contexts; the design of activities that integrate AI with teaching and learning; the use of AI-generated data to inform decision-making; and the oversight of AI use grounded in ethics, human rights, and transparency. These competencies are not intended to position teachers as technology specialists, but rather to ensure that teachers understand the potential and limitations of AI, can evaluate the reliability of AI-generated content, and are able to use AI as an appropriate instrument for advancing learner development. In addition, the DigCompEdu framework emphasizes teachers' capacity to use technology for professional development, the creation of digital resources, learning management, assessment, and the cultivation of learners' digital competencies — competencies that, when integrated with AI Competency, give rise to a new teacher competency profile capable of responding effectively to the transformations of an AI-driven society (Redecker & Punie, 2017; Sukanya,2026;UNESCO, 2024).

Beyond technological competencies, professional teachers in the AI era must develop Critical Thinking, Data and AI Literacy, and Ethical Decision-Making capabilities, given that AI systems may generate inaccurate, biased, or contextually inappropriate information. Should teachers lack the ability to verify and evaluate the quality of such information, the quality of learning management and learner development will inevitably be compromised. Teachers must therefore be capable of analyzing information sources, comparing outputs across multiple systems, exercising judgment in the selection and use of data, and instilling in learners the capacity to use AI critically and responsibly. At the same time, Learning Design Competency has grown substantially in importance, as AI can rapidly generate content, exercises, and learning materials, yet the quality of these outputs remains contingent upon teachers' ability to define learning objectives, design activities that promote higher-order thinking, and construct learning scenarios connected to real-life contexts. Teachers must thus function as learning designers capable of integrating the potential of AI with pedagogical science, so that learners achieve meaningful learning that transcends the passive reception of automatically generated content. Furthermore, teachers must possess Lifelong Learning Competency, as AI technology continues to evolve at pace; the ongoing pursuit of new knowledge, experimentation with emerging tools, and participation in collaborative exchange through Professional Learning Communities (PLCs) are therefore essential factors enabling teachers to adapt and develop professionally on a continuous basis (Darling-Hammond et al., 2020; UNESCO, 2024).

Viewed from a broader perspective of future teacher development, the new competencies of professional teachers do not arise from the addition of technological skills in isolation, but from the integration of four essential components: (1) Professional Competency, encompassing pedagogical knowledge, leadership, and professional development; (2) Digital Competency, pertaining to the use of technology in learning management and data administration; (3) AI Competency, covering the understanding, application, and ethical governance of AI; and (4) Human Competency, comprising emotional intelligence, communication, the capacity to inspire, collaborative working, and the promotion of learners' moral development. These four competency domains are systematically interrelated and mutually reinforcing — AI serves to enhance the efficiency of teachers' professional practice, while human qualities generate forms of value that technology cannot replace. The development of professional teachers in the AI era should therefore aim to strike a balance between effective technology use and the preservation of teachers' professional identity, enabling them to serve sustainably as leaders of learning, cultivators of innovation, and developers of learner potential amid the transformations of the digital world (McEwan, 2002; Office of the Basic Education Commission, 2024;Sukanya,2026;UNESCO, 2024).

### IV. DIRECTIONS FOR DEVELOPING PROFESSIONAL TEACHERS TO PREPARE FOR THE FUTURE

The development of professional teachers in the age of artificial intelligence must transition from models centered on short-term training or occasional technology knowledge transfer, toward systems of Continuous Professional Development (CPD) that connect learning to actual professional practice and are capable of responding to technological change in a timely manner. UNESCO (2024) proposes that teacher development in the AI era should be implemented systematically, encompassing the building of foundational knowledge about artificial intelligence, the development of capacity to apply AI in learning management, the strengthening of

understanding regarding AI ethics and governance, and the cultivation of the ability to oversee appropriate AI use in the classroom. This approach aligns with the DigCompEdu framework, which prioritizes the development of teachers' digital competencies through collaborative learning, experience sharing, and continuous reflective practice (Redecker & Punie, 2017; Sukanya,2026).In the Thai context, although the Office of the Basic Education Commission has already established a digital competency framework for teachers and educational personnel, the rapid pace of AI advancement indicates that future teacher development should expand from Digital Competency toward AI Competency — encompassing not only the skills to use AI tools, but also the capacity to analyze, evaluate, and critically oversee AI use, so that teachers can select and apply technology in ways appropriate to the contexts of their learners, schools, and communities. Such development will enable teachers to transition from technology users to designers of learning innovations that genuinely harness AI as an instrument for advancing learner potential (UNESCO, 2021; UNESCO, 2024).

Beyond individual-level teacher development, elevating the quality of professional teachers requires support at both the institutional and policy levels in tandem. At the institutional level, school administrators should cultivate an organizational culture that promotes collaborative learning, supports the experimentation with innovations, and creates opportunities for teachers to exchange knowledge through Professional Learning Communities (PLCs). Such an approach will enable teachers to develop new knowledge and skills through real-world practice, generate reflective insights into learning management, and collaboratively develop innovations suited to each school's context. Simultaneously, school administrators should use AI and analytical data to support academic decision-making, teacher development planning, and the systematic monitoring of learner progress. At the policy level, education authorities should revise professional teacher standards to incorporate AI competencies, establish teacher development curricula that are flexible and responsive to technological change, and support digital infrastructure and data systems that facilitate the use of AI in educational provision. In addition, a system of AI Competency Certification for teachers should be developed to serve as an incentive for professional development and to establish shared standards for quality and ethical AI use across the education system as a whole. Sustained outcomes from teacher development will be realized only when individual-, organizational-, and policy-level development are systematically interconnected and mutually reinforcing (Darling-Hammond et al., 2020; UNESCO, 2024).

Considering the trajectory of education in the future, the success of professional teacher development does not depend solely on the ability to use AI, but on the capacity to strike a balance between technological innovation and Human-Centered Education values. Teachers of the future should therefore be developed to become AI-Empowered Learning Leaders — capable of integrating professional knowledge, digital competency, AI literacy, and ethical leadership in a balanced and coherent manner. This role encompasses the design of AI-enhanced learning that promotes higher-order thinking, the creation of learning environments attentive to individual learner differences, the cultivation of responsible AI use, and the preparation of learners for lifelong learning and readiness to navigate the transformations of the future world. At the same time, teachers must preserve a professional identity grounded in compassion, empathy, justice, and respect for human dignity — values that AI cannot replace. The development of professional teachers in the future should therefore aim to build a Learning Ecosystem that connects teachers, learners, administrators, teacher preparation institutions, and policymaking bodies in a shared commitment to the continuous development of teacher potential, under the principle of AI for Empowering Teachers rather than AI for replacing them. This will ultimately lead to the elevation of educational quality and the development of learners with competencies aligned with the transformations of the twenty-first century world, in a manner that is lasting and sustainable (McEwan, 2002; UNESCO, 2024).

## V. CONCLUSION

The transition into the age of artificial intelligence has brought about structurally significant transformations to the educational system and the teaching profession — shifting teachers from their former role as transmitters of knowledge toward becoming designers of learning experiences, facilitators of learning, data-informed practitioners, and leaders of educational change. AI technology has come to play a supporting role in learning management, learner data analysis, learning material creation, and assessment, thereby enhancing the efficiency of teachers' professional practice across numerous dimensions. Nevertheless, the core values of the teaching profession remain grounded in the capacity to inspire, to cultivate moral and ethical development, to understand individual differences, and to build positive relationships with learners — roles that technology cannot fully replicate. For this reason, the development of professional teachers in the AI era should not focus exclusively

on technology use or the acquisition of new tools, but should constitute an integrated development of competencies spanning professional knowledge, digital competency, AI literacy, and human competency, so that teachers are equipped to apply AI critically, ethically, and in alignment with the goals of twenty-first century learner development. A synthesis of knowledge drawn from the UNESCO AI Competency Framework for Teachers, DigCompEdu, and Thailand's digital competency framework demonstrates that future teacher development should be grounded in the principle of "AI for Empowering Teachers" rather than AI for replacing them — enabling teachers to harness the potential of AI to elevate the quality of learning, while preserving the values of teacherhood and of human connection (UNESCO, 2021; UNESCO, 2024; Redecker & Punie, 2017).

In the context of Thai education, developing professional teachers to meet the demands of the future requires collaboration across all sectors — including teacher preparation institutions, schools, supervising agencies, policymakers, and professional networks — to jointly design a teacher development system that systematically connects individual-, organizational-, and policy-level development. Teacher development should transition from fragmented training models toward lifelong learning that emerges from actual professional practice, collaborative exchange through Professional Learning Communities, classroom-based research, and the continuous use of data to improve learning management. Furthermore, future professional teacher standards should encompass AI competency and digital ethics, enabling teachers to appropriately oversee learners' AI use, guard against risks arising from inaccurate information, algorithmic bias, and privacy violations, while simultaneously promoting the use of AI to develop learners' critical thinking, creativity, and lifelong learning capacities. Drawing on the synthesis of all content presented, this article proposes that the future of the professional teacher does not rest on the capacity to compete with AI, but on the capacity to collaborate with AI effectively — using technology as an instrument to extend teachers' potential while preserving compassion, moral integrity, leadership, and accountability for human development, which are the core values of the teaching profession that no technology can replace. Striking a balance between digital innovation and human values thus constitutes the essential foundation for developing professional teachers and sustainably elevating educational quality in the age of artificial intelligence (McEwan, 2002; Office of the Basic Education Commission, 2024; UNESCO, 2024).

## VI. RECOMMENDATIONS

### 1. Policy Recommendations for Teacher Development

Education authorities at all levels — including the ministry, supervising agencies, and teacher preparation institutions — should revise the professional teacher standards framework to incorporate AI Competency alongside existing professional and digital competencies, establishing a systematic approach to teacher development spanning initial teacher preparation, in-service development, and Continuous Professional Development (CPD). In addition, training curricula should be developed with emphasis on the application of AI in learning management, assessment design, learner data analysis, and the use of AI under principles of ethics, transparency, and accountability — so that teachers are equipped to use technology as an instrument for elevating educational quality, rather than merely as a means of enhancing operational efficiency. Policy formulation should be aligned with international standard frameworks, such as the UNESCO AI Competency Framework for Teachers and DigCompEdu, to ensure that Thai teacher development remains consistent with global educational trends (UNESCO, 2024; Redecker & Punie, 2017).

### 2. Practical Recommendations for Schools and Teachers

School administrators should foster a Learning Ecosystem conducive to the development of teachers' AI competencies, through the establishment of Professional Learning Communities (PLCs), knowledge exchange, classroom-based research, and continuous experimentation with innovations. At the same time, teachers should cultivate themselves as lifelong learners — keeping abreast of technological advancements, exploring approaches to using AI for learning design, assessment, and the promotion of personalized learning, as well as developing skills in critical thinking, information literacy, and the ethical oversight of learners' AI use. Such development

should be grounded in the principle that AI serves as a tool to extend teachers' potential rather than to replace their role, ensuring that learning management remains learner-centered and capable of developing learners' knowledge, skills, moral integrity, and desirable characteristics in a balanced manner (Office of the Basic Education Commission, 2024; UNESCO, 2021).

### **3. Recommendations for Future Research and Knowledge Development**

Research should be conducted to extend the knowledge base regarding teacher competencies in the AI era, both conceptually and empirically — particularly in the development and validation of a professional teacher competency framework for the AI era appropriate to the Thai context, the construction of indicators and assessment instruments for teachers' AI competency, and the investigation of the impact of AI use on the quality of learning management, learner outcomes, and teacher professional development. In addition, comparative research should be undertaken to examine teacher development models across different countries and to synthesize Best Practices for application in the development of Thailand's education system. Such efforts will serve to build a robust knowledge base, support evidence-informed policymaking, and ultimately contribute to the development of professional teachers who are capable of collaborating with AI effectively, ethically, and in a manner that is sustainably responsive to the transformations of the future world (McEwan, 2002; UNESCO, 2024).

## **VII. CONCLUSION**

The transition into the age of artificial intelligence has brought about structurally significant transformations to the educational system and the teaching profession — shifting teachers from their former role as transmitters of knowledge toward becoming designers of learning experiences, facilitators of learning, data-informed practitioners, and leaders of educational change. AI technology has come to play a supporting role in learning management, learner data analysis, learning material creation, and assessment, thereby enhancing the efficiency of teachers' professional practice across numerous dimensions. Nevertheless, the core values of the teaching profession remain grounded in the capacity to inspire, to cultivate moral and ethical development, to understand individual differences, and to build positive relationships with learners — roles that technology cannot fully replicate. For this reason, the development of professional teachers in the AI era should not focus exclusively on technology use or the acquisition of new tools, but should constitute an integrated development of competencies spanning professional knowledge, digital competency, AI literacy, and human competency, so that teachers are equipped to apply AI critically, ethically, and in alignment with the goals of twenty-first century learner development. A synthesis of knowledge drawn from the UNESCO AI Competency Framework for Teachers, DigCompEdu, and Thailand's digital competency framework demonstrates that future teacher development should be grounded in the principle of "AI for Empowering Teachers" rather than AI for replacing them — enabling teachers to harness the potential of AI to elevate the quality of learning, while preserving the values of teacherhood and of human connection (UNESCO, 2021; UNESCO, 2024; Redecker & Punie, 2017).

### VIII. NEW KNOWLEDGE CONTRIBUTION

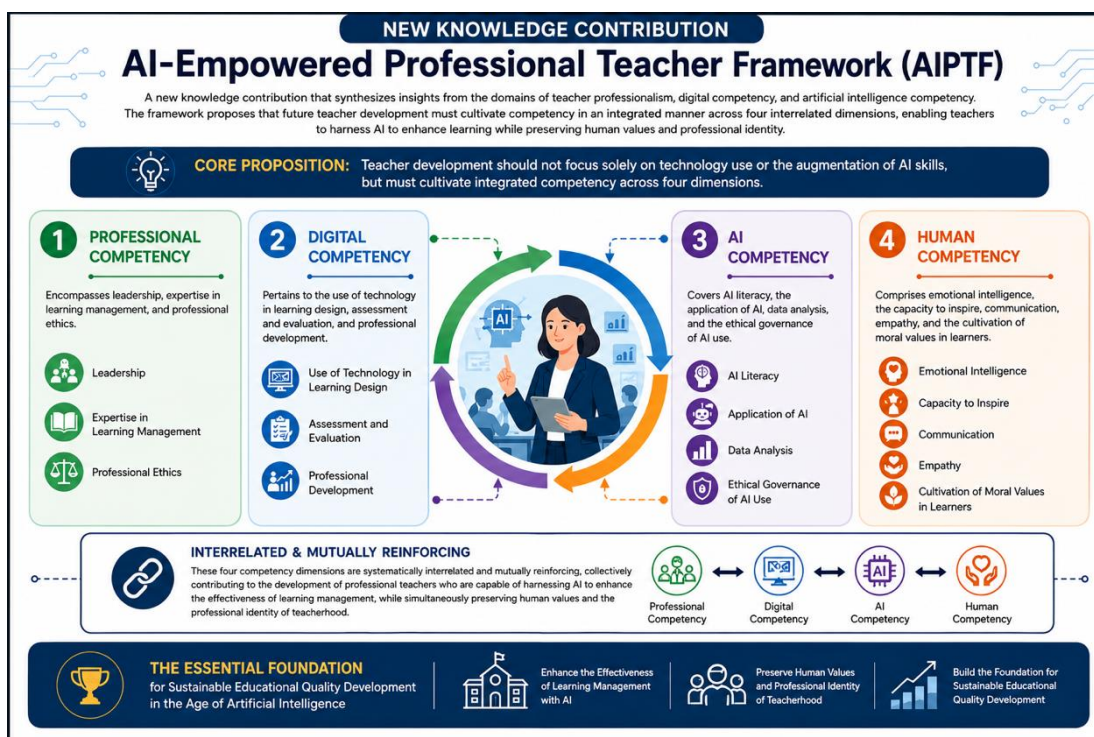


Figure 1 : NEW KNOWLEDGE CONTRIBUTION

From Figure 1, this article presents a new knowledge contribution in the form of the **AI-Empowered Professional Teacher Framework (AIPTF)** — a product of the synthesis of knowledge drawn from the domains of teacher professionalism, digital competency, and artificial intelligence competency. The framework is grounded in the proposition that future teacher development should not focus exclusively on technology use or the augmentation of AI skills, but must cultivate competency in an integrated manner across four dimensions: (1) **Professional Competency**, encompassing leadership, expertise in learning management, and professional ethics; (2) **Digital Competency**, pertaining to the use of technology in learning design, assessment and evaluation, and professional development; (3) **AI Competency**, covering AI literacy, the application of AI, data analysis, and the ethical governance of AI use; and (4) **Human Competency**, comprising emotional intelligence, the capacity to inspire, communication, empathy, and the cultivation of moral values in learners. These four competency dimensions are systematically interrelated and mutually reinforcing, collectively contributing to the development of professional teachers who are capable of harnessing AI to enhance the effectiveness of learning management, while simultaneously preserving human values and the professional identity of teacherhood — constituting the essential foundation for sustainable educational quality development in the age of artificial intelligence.

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