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Artificial Intelligence Competence Self-Efficacy and Attitudes Toward AI Among T.V.E Teachers as Basis for a Professional Development Plan

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ABSTRACT

This study examined Artificial Intelligence (AI) Competence Self-Efficacy and Attitudes Toward AI among Technology and Vocational Education (TVE) teachers at Abellana National School as a basis for a proposed Professional Development Plan. Anchored in Social Cognitive Theory, the Technology Acceptance Model, and the Technological Pedagogical Content Knowledge (TPACK) Framework, the study employed a quantitative descriptive-correlational design involving 45 TVE teachers selected through total population sampling. Data were collected using the Teacher Artificial Intelligence Competence Self-Efficacy Scale (TAICS) and the Teachers' Attitudes Toward Artificial Intelligence in Education (TATAIE) Scale. Descriptive statistics and Pearson Product-Moment Correlation were employed for data analysis. Findings revealed high AI Competence Self-Efficacy across six dimensions, with AI Pedagogy obtaining the highest mean (4.01) and AI Assessment the lowest (3.69). Respondents demonstrated favorable Attitudes Toward AI, particularly its Usefulness for Teachers (M = 4.21), while Usefulness for Learners received the lowest rating (M = 3.62). A strong positive and statistically significant relationship was established between AI Competence Self-Efficacy and Attitudes Toward AI ($r = 0.691$, $p < .001$), indicating that greater perceived competence was associated with more favorable attitudes. The study recommended a Professional Development Plan prioritizing AI-supported assessment, learner-centered applications, ethical AI integration, and continuous professional engagement. The research aligns with Sustainable Development Goal 4 (Quality Education), SDG 9 (Industry, Innovation and Infrastructure), and SDG 8 (Decent Work and Economic Growth) through teacher development, technological innovation, and vocational education. Its potential sustainability impact involves strengthening institutional teaching capacity, promoting responsible AI adoption, and supporting continuous improvement in skills-oriented education.

Keywords: *AI Competence Self-Efficacy, Artificial Intelligence, Attitudes Toward AI, Descriptive-Correlational Research, Professional Development Plan, Sustainable Development Goals, Teacher Professional Development, Technology and Vocational Education*

1. INTRODUCTION

Artificial Intelligence (AI) has transformed educational practices by introducing adaptive learning systems, generative AI, automated assessment, and virtual teaching assistance that support personalized instruction and educational efficiency (Miao & Holmes, 2023). These technologies provide opportunities for teachers to improve lesson preparation, instructional delivery, assessment, and feedback (Miao & Holmes, 2023). However, effective AI integration requires adequate teacher competence, confidence, institutional support, and ethical awareness, particularly regarding privacy and responsible technology use (Miao & Holmes, 2023). In the Philippines, educational digitalization emphasizes teachers' technological competence and innovative instructional practices (Department of Education, 2022). Miao and Holmes (2023) further emphasizes human agency, ethical responsibility, and teacher readiness in AI-supported education. These considerations are particularly relevant to Technology and Vocational Education (TVE), where teachers must integrate technological knowledge with competency-based instruction, practical skills development, and assessment. Teachers' confidence in performing AI-related tasks and their attitudes toward emerging technologies may influence their readiness to integrate AI into instruction (Chiu et al., 2025). This study examined AI Competence Self-Efficacy and Attitudes Toward AI among TVE teachers at Abellana National School during School Year 2026–2027. It aimed to determine the relationship between these variables and provide an empirical basis for a Professional Development Plan supporting responsible, effective, and learner-centered AI integration.

Research Problem

Despite the increasing application of AI in education, limited empirical evidence addresses AI Competence Self-Efficacy and Attitudes Toward AI among Philippine public secondary school TVE teachers. Existing studies have examined teachers' technological competence, self-efficacy, and technology acceptance across educational contexts, but the specific professional development needs of TVE teachers remain insufficiently explored. Teachers' perceived capabilities and attitudes may influence their willingness to adopt AI technologies in instructional practice (Ahmadi et al., 2025; Chiu et al., 2025). This gap is significant because TVE instruction requires the integration of technological applications with practical competencies, instructional planning, performance assessment, and ethical decision-making. At Abellana National School, determining teachers' confidence in using AI and their perceptions of its educational value is essential for identifying professional strengths and areas requiring improvement. Accordingly, the central research problem concerns the relationship between AI Competence Self-Efficacy and Attitudes Toward AI among TVE teachers. Addressing this problem provides evidence for developing a Professional Development Plan responsive to teachers' instructional and technological needs.

Assumptions of the Study

The study was guided by the assumption that teachers' perceived confidence in performing AI-related tasks and their Attitudes Toward AI are relevant considerations in educational technology integration. Based on Social Cognitive Theory, self-efficacy represents individuals' beliefs in their ability to perform activities necessary to achieve intended outcomes (Bandura, 1997). Teachers with greater confidence may demonstrate stronger willingness to engage with emerging instructional technologies. The study further assumed that AI Competence Self-Efficacy could be assessed through teachers' self-reported perceptions rather than direct measurements of actual technological competence. Chiu et al. (2025) provided the Teacher Artificial Intelligence Competence Self-Efficacy Scale (TAICS) for examining teachers' confidence in performing AI-related educational tasks. Professional learning experiences and institutional support were also considered relevant to strengthening teachers' AI-related confidence. Yang et al. (2024)

emphasized that practical instructional experiences, reflection, and professional collaboration contribute to teachers' self-efficacy in AI integration. These assumptions provided the basis for examining the study variables without presuming that a statistically significant relationship necessarily existed between them.

Objectives of the Study

The general objective of the study was to determine the relationship between AI Competence Self-Efficacy and Attitudes Toward Artificial Intelligence among Technology and Vocational Education (TVE) teachers at Abellana National School during School Year 2026–2027 as a basis for a proposed Professional Development Plan. Specifically, the study aimed to describe the respondents' profiles in terms of age, gender, highest educational attainment, teaching position or rank, years of teaching experience, TVE specialization, and access to technology; determine their level of AI Competence Self-Efficacy in terms of AI Knowledge, AI Pedagogy, AI Assessment, AI Ethics, Human-Centered Education, and Professional Engagement; assess their Attitudes Toward AI in terms of interest, intention to use, ethical concerns, usefulness for teachers, and usefulness for learners; determine whether a statistically significant relationship exists between AI Competence Self-Efficacy and Attitudes Toward AI; and propose a Professional Development Plan based on the study findings. Furthermore, the study tested the null hypothesis that no statistically significant relationship exists between AI Competence Self-Efficacy and Attitudes Toward AI among TVE teachers at Abellana National School at the 0.05 level of significance.

Conceptual and Theoretical Framework

The study was anchored on Bandura's (1986, 1997) Social Cognitive Theory, Davis' (1989) Technology Acceptance Model (TAM), and Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) Framework. These perspectives collectively explain teachers' perceived capabilities, attitudes toward emerging technologies, and integration of AI into instructional practice. Social Cognitive Theory emphasizes self-efficacy as a factor influencing individuals' confidence, motivation, and willingness to undertake challenging activities. In this study, it provides the theoretical foundation for understanding teachers' perceived capabilities in performing AI-related tasks across knowledge, pedagogy, assessment, ethics, human-centered education, and professional engagement. The Technology Acceptance Model proposed by Davis (1989) explains technology adoption through perceived usefulness and perceived ease of use. Davis (1989) identifies these perceptions as important determinants of technology acceptance. In educational contexts, perceived usefulness concerns AI's potential to improve instructional planning, assessment, and teaching efficiency. Amir-Rudin et al. (2025) emphasized the perceived utility of AI in professional and educational applications, while Kong et al. (2024) identified relationships among teachers' perceived usefulness, self-efficacy, attitudes, and intentions to use generative AI. Perceived ease of use further explains how teachers evaluate the effort required to adopt technological innovations (Davis, 1989). Haces et al. (2024) and Nguyen & Pham (2023) identified ease of use as an important consideration in technology acceptance. Accordingly, the model supports the examination of teachers' interest, intention to use AI, ethical concerns, and perceptions of AI's usefulness for teachers and learners. The TPACK framework developed by Mishra and Koehler (2006) emphasizes the integration of technological, pedagogical, and content knowledge for effective instruction. This perspective is relevant to TVE because AI applications must support practical competencies, instructional objectives, and appropriate assessment practices. Celik (2023) highlighted the importance of pedagogical knowledge and ethical considerations in teachers' AI integration. Within the present study, TPACK serves as a supporting interpretive framework rather than a separately measured variable. The conceptual basis also recognizes the importance of continuous professional development and educational policies supporting technology-

responsive instruction. Republic Act No. 10533, or the Enhanced Basic Education Act of 2013, promotes relevant and learner-centered education. Ng et al. (2023) emphasized the need for teachers to develop AI-related and 21st-century competencies in response to educational transformation. Similarly, Department of Education (2017), through DepEd Order No. 42, s. 2017, which established the Philippine Professional Standards for Teachers, supports continuous professional development. Yang et al. (2024) demonstrated the relevance of structured professional learning in strengthening teachers' AI-related self-efficacy. The Department of Education (2022), through DepEd Order No. 024, s. 2022, adopting the Basic Education Development Plan 2030, further supports educational quality and responsiveness, consistent with the emphasis of Kong et al. (2024) on teachers' knowledge, skills, and professional development. Collectively, these theories and policy foundations establish the relationship between perceived AI competence, technology acceptance, and instructional practice, providing the conceptual basis for the proposed Professional Development Plan.

Sustainable Development Goal and Multidisciplinary Sustainability Relevance

The study primarily aligns with Sustainable Development Goal 4 (Quality Education), particularly its emphasis on inclusive, equitable, and quality education and the professional development of teachers. By examining TVE teachers' AI Competence Self-Efficacy and Attitudes Toward AI, the research provides evidence for identifying training needs and developing professional learning opportunities. Its proposed Professional Development Plan supports educational sustainability through continuous teacher development, responsible technology integration, and improved instructional practices. The study also contributes to Sustainable Development Goal 9 (Industry, Innovation and Infrastructure) through its focus on technological innovation and teachers' capacity to integrate AI into vocational instruction. Strengthening AI-related pedagogical knowledge, assessment practices, and professional engagement supports technological and innovation sustainability by promoting educators' adaptability to emerging digital technologies. Additionally, the study has relevance to Sustainable Development Goal 8 (Decent Work and Economic Growth) through the professional development and competency-based orientation of TVE. By supporting teachers' ability to integrate AI into practical and vocational instruction, the research may contribute indirectly to developing relevant technical competencies and improving the quality of skills-oriented education. Overall, the study contributes primarily to educational and technological sustainability, with potential implications for socio-economic sustainability. Its contribution lies in providing an evidence-based foundation for continuous professional development, ethical AI adoption, and learner-centered vocational education rather than directly measuring progress toward the identified SDGs.

2. METHODOLOGY

Research Design

The study utilized a quantitative descriptive-correlational research design to describe respondents' demographic profiles, levels of AI Competence Self-Efficacy, and Attitudes Toward AI, and to determine the relationship between the two principal variables. Quantitative research involves collecting and analyzing numerical data to examine variables and their relationships (Miksza et al., 2023). The descriptive component assessed teachers' existing characteristics, perceived AI competencies, and attitudes, while the correlational component examined the association between AI Competence Self-Efficacy and Attitudes Toward AI without manipulating the variables. Correlational research allows relationships between variables to be investigated within natural settings (Miksza et al., 2023). The study followed an Input–Process–Output (IPO) framework. Inputs consisted of respondents' demographic profiles, AI Competence Self-Efficacy, and Attitudes Toward AI. The process involved securing institutional approvals, administering questionnaires, collecting responses, and conducting statistical analysis. The

output was a proposed Professional Development Plan addressing the identified professional learning needs of TVE teachers.

Research Locale or Study Setting

The study was conducted at Abellana National School, a public secondary school under the Schools Division of Cebu City, Philippines. The institution was selected because it offers Technology and Vocational Education programs and employs teachers with varying educational qualifications, teaching experiences, specializations, and access to technological resources. The school provided an appropriate setting for examining teachers' AI Competence Self-Efficacy and Attitudes Toward AI within a common institutional environment. Conducting the research in a single school allowed the respondents to be assessed under comparable administrative policies, instructional conditions, and institutional support systems. The findings provided school-specific evidence for developing professional learning initiatives supporting the effective and ethical integration of AI into vocational education.

Participants or Data Sources

The respondents consisted of 45 Technology and Vocational Education teachers at Abellana National School, selected through total population sampling or total enumeration. This technique was employed because the target population was sufficiently small to include all eligible teachers. Of the respondents, 24 (53.33%) specialized in Industrial Arts, while 21 (46.67%) specialized in Home Economics. Eligibility required respondents to be employed at Abellana National School and assigned to teach at least one TVE subject during the research period. Teachers without TVE teaching assignments and those unavailable during data collection were excluded. The eligible population was established using the approved list of TVE teachers provided by the school principal, TVE Learning Area Leader, and relevant administrative personnel. Including the entire eligible population enabled a comprehensive description of teachers' perceived AI competencies and attitudes within the institution.

Research Instruments or Materials

Data were collected using a structured survey questionnaire consisting of three parts. The first gathered respondents' demographic information, including age, gender, highest educational attainment, teaching position or rank, years of teaching experience, TVE specialization, and access to technology. The second part utilized the Teacher Artificial Intelligence Competence Self-Efficacy Scale (TAICS), developed and validated by Chiu et al. (2025). The instrument measured teachers' perceived confidence in performing AI-related educational tasks across six dimensions: AI Knowledge, AI Pedagogy, AI Assessment, AI Ethics, Human-Centered Education, and Professional Engagement. Chiu et al. (2025) established the scale as a framework for assessing teachers' AI-related self-efficacy. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument demonstrated a Cronbach's alpha reliability coefficient of 0.87, as reported by Chiu et al. (2025). The third part was adapted from the Teachers' Attitudes Toward Artificial Intelligence in Education (TATAIE) Scale developed by Ahmadi Fatalaki et al. (2025). Ahmadi et al. (2025) established the instrument for assessing teachers' Attitudes Toward AI integration in education. The scale comprised 28 items covering interest, intention to use, ethical concerns, usefulness for teachers, and usefulness for learners. It employed the same five-point Likert response format, with a reported pilot-test Cronbach's alpha coefficient of .87, indicating acceptable reliability.

Data Gathering Procedure

Data collection commenced with securing an endorsement from the Dean of the College of Education, Graduate Teacher Education, followed by authorization from the Cebu City Schools

Division. Upon obtaining the necessary approvals, the researcher coordinated with the school principal and TVE Learning Area Coordinator of Abellana National School to identify eligible respondents and arrange questionnaire administration. Before administering the instruments, the researcher explained the study's purpose, objectives, and procedures and obtained informed consent from the respondents. During the scheduled data collection, questionnaires were distributed with appropriate instructions, and participants were given sufficient time to complete their responses and seek clarification when necessary. After administration, the completed questionnaires were collected and checked for completeness. Responses were subsequently organized, categorized, coded, and tabulated for statistical analysis with the assistance of a research statistician. The analyzed data provided the empirical basis for developing the proposed Professional Development Plan.

Data Analysis

The collected data were processed using descriptive and inferential statistical techniques. Frequency counts and percentages were used to describe respondents' demographic characteristics, including age, gender, educational attainment, teaching position or rank, teaching experience, TVE specialization, and access to technology. Weighted means were computed to determine the levels of AI Competence Self-Efficacy across six dimensions and Attitudes Toward AI across five dimensions. Standard deviation was used to describe the dispersion of responses around the mean. The Pearson Product-Moment Correlation Coefficient (PPMCC) was employed to determine the relationship between AI Competence Self-Efficacy and Attitudes Toward AI, with statistical significance evaluated at the 0.05 level. Mean scores for AI Competence Self-Efficacy were interpreted as very high (4.21–5.00), high (3.41–4.20), moderate (2.61–3.40), low (1.81–2.60), and very low (1.00–1.80). For Attitudes Toward AI, the corresponding ranges were interpreted as very well likely, well likely, somewhat likely, not likely, and do not manifest the attitude, respectively. These interpretations provided a standardized basis for evaluating respondents' perceptions and identifying areas requiring professional development.

Ethical Considerations

The study observed ethical procedures by obtaining the necessary institutional approvals before data collection and securing informed consent from all respondents. Participants were informed of the study's objectives, procedures, and voluntary nature before completing the questionnaires. The researcher assured respondents that their personal information and responses would remain confidential and would be used exclusively for academic and research purposes. Participants were provided with clear instructions and opportunities to seek clarification during questionnaire administration. These measures supported voluntary participation, confidentiality, and responsible handling of research information throughout the study.

3. RESULTS AND DISCUSSION

3.1 Profile of the Respondents

3.1.1 Age and Gender

The respondents were predominantly aged 50–59 years, comprising 19 teachers (42.22%), followed by those aged 30–39 years (24.44%) and 40–49 years (20.00%). The youngest and oldest age groups each represented 6.67%. Respondents ranged from 28 to 64 years old, with a mean age of 46.51 years. In terms of gender, 32 respondents (71.11%) were female, while 13 (28.89%) were male. The predominance of middle-aged teachers reflects the relevance of generativity, which emphasizes adults' contributions to the development of others through teaching and mentoring. Reinilä et al. (2023) discusses the importance of generativity in professional and

social responsibilities. However, age and gender alone do not establish differences in technological competence. Galindo-Domínguez et al. (2024) emphasized the importance of teaching experience and digital training, while Galindo-Domínguez et al. (2024) and Lucas et al. (2024) identified a positive relationship between teachers' digital competence and Attitudes Toward AI regardless of demographic characteristics. These findings support inclusive professional development responsive to teachers' varying technological experiences.

3.1.2 Highest Educational Attainment

Most respondents held a baccalaureate degree, accounting for 37 teachers (82.22%). Seven respondents (15.56%) had earned master's degrees, while one (2.22%) possessed a doctorate degree. These findings indicate that undergraduate qualifications predominated, although some teachers had pursued advanced academic studies. The distribution highlights the importance of continuous professional development beyond formal educational qualifications. Ng et al. (2023) emphasized the need for teachers to develop competencies responsive to technological advancements, while Chiu et al. (2024) underscored the importance of strengthening teachers' AI-related knowledge and capabilities. Accordingly, professional development opportunities remain relevant across different educational attainment levels.

3.1.3 Teaching Position or Rank

The majority of respondents held the position of Teacher III, comprising 26 teachers (57.78%), followed by Teacher I with nine (20.00%) and Teacher IV with three (6.67%). Teacher II, Teacher V, and Teacher VI each accounted for one respondent (2.22%), while Master Teacher I and Master Teacher II each comprised two respondents (4.44%). These results indicate that most participants occupied regular teaching positions, with fewer holding advanced teaching ranks. The distribution reflects varying levels of professional responsibility and career advancement among respondents. Professional learning opportunities should therefore accommodate teachers across different ranks rather than assume that higher positions correspond to greater AI competence. Ng et al. (2023) emphasized continuous professional improvement, while Chiu et al. (2024) highlighted the importance of developing teachers' confidence and capabilities in AI-supported educational activities.

3.1.4 Years of Teaching Experience

Most respondents had substantial teaching experience, with 33 teachers (73.33%) having served for 11 years or longer. Seven respondents (15.56%) had taught for 0–2 years, three (6.67%) for 6–10 years, and two (4.44%) for 3–5 years. The findings indicate that the respondents were predominantly experienced educators. Teaching experience provides opportunities for developing instructional expertise but does not automatically establish competence in emerging technologies. Avidov-Ungar et al. (2023) emphasized that teachers' professional development needs vary according to career stage, experience, and opportunities for learning. Thus, experienced and beginning teachers may require differentiated training, mentoring, and collaborative activities to strengthen their AI-related competencies.

3.1.5 TVE Specialization

Among the 45 respondents, 24 teachers (53.33%) specialized in Industrial Arts, while 21 (46.67%) specialized in Home Economics. Both major TVE specializations were represented, with Industrial Arts accounting for a slightly larger proportion. The distribution emphasizes the need

to align AI-related professional development with the instructional requirements of different vocational disciplines. Demapendan (2024) highlighted the importance of aligning technological applications with subject-specific teaching contexts. Similarly, Galindo-Domínguez et al. (2024) emphasized the relevance of digital knowledge and skills in educational practice. These findings support professional learning activities that address the distinct instructional and assessment requirements of Home Economics and Industrial Arts.

3.1.6 Access to Technology

Most respondents reported access to essential technological resources. Specifically, 44 teachers (97.78%) had internet access, while one (2.22%) did not. Similarly, 44 respondents (97.78%) reported access to a laptop or mobile gadget, with one respondent (2.22%) reporting otherwise. The findings indicate that basic technological access was widely available among respondents. Nevertheless, access alone does not establish effective or pedagogically appropriate AI integration. Consoli et al. (2023) emphasized the importance of integrating technological resources into meaningful educational practices. Thus, professional development should address not only technology availability but also teachers' abilities to select, evaluate, and use AI tools appropriately in TVE instruction.

3.2 Level of AI Competence Self-Efficacy

3.2.1 AI Knowledge

Respondents demonstrated a high level of AI Knowledge self-efficacy, with an overall mean of 3.93 (SD = 0.75), interpreted as Agree. The highest-rated indicator concerned explaining AI concepts (M = 3.98), followed by distinguishing AI-based tools (M = 3.96). Confidence in creating AI-generated content obtained a mean of 3.91, while selecting appropriate AI tools received the lowest mean of 3.89. These findings indicate that teachers generally perceived themselves as knowledgeable about AI concepts and applications, although selecting appropriate tools remained a comparatively weaker area. Chiu et al. (2024) emphasized that AI competence self-efficacy includes confidence in understanding and applying AI technologies. Consoli et al. (2023) highlighted the importance of purposeful technological integration, while Celik (2023) stressed that technological knowledge should be supported by pedagogical judgment. These findings suggest the relevance of training in AI tool selection and instructional application.

3.2.2 AI Pedagogy

AI Pedagogy obtained an overall mean of 4.01 (SD = 0.79), indicating a high level of self-efficacy. Teachers reported the greatest confidence in combining subject content, AI tools, and instructional approaches (M = 4.09). Selecting AI tools that enhance teaching and subject content both obtained means of 4.07, while helping colleagues coordinate AI-supported instruction received the lowest mean of 3.80. The results indicate that teachers were generally confident in incorporating AI into their instructional practices but were comparatively less confident in assisting colleagues with AI integration. This aligns with Mishra and Koehler's (2006) TPACK Framework, which emphasizes the integration of technological, pedagogical, and content knowledge. Celik (2023) emphasized the importance of pedagogically appropriate technology integration, while Yang et al. (2024) highlighted the role of professional learning experiences and collaboration in strengthening teachers' AI-related confidence.

3.2.3 AI Assessment

AI Assessment recorded an overall mean of 3.69 (SD = 0.76), interpreted as a high level of self-efficacy but the lowest among the six AI competence dimensions. Designing AI-supported assessment approaches obtained the highest mean of 3.87, followed by using AI for assessment for learning (M = 3.84). Selecting AI tools for student self-assessment received a mean of 3.62, while assessing student learning in AI-based environments obtained the lowest mean of 3.44. The findings indicate that teachers were comparatively less confident in evaluating student learning through AI-supported environments. Chiu et al. (2024) identified AI Assessment as an important dimension of teachers' AI competence self-efficacy. Bower et al. (2024) emphasized the importance of authentic assessment and higher-order thinking in AI-supported education, while Hao et al. (2024) discussed challenges associated with assessment practices involving generative AI. These findings support prioritizing AI-supported assessment design, evaluation, and student self-assessment in professional development.

3.2.4 AI Ethics

AI Ethics obtained an overall mean of 3.81 (SD = 0.84), indicating a high level of self-efficacy. Teachers reported the greatest confidence in teaching students to use AI safely and responsibly (M = 3.87). Protecting sensitive information received a mean of 3.80, while teaching ethical considerations and maintaining health and well-being during AI use both obtained means of 3.78. The findings indicate that teachers generally perceived themselves as capable of promoting responsible AI use, although further development in ethical awareness and information protection remains relevant. Bower et al. (2024) highlighted educators' concerns regarding ethical AI applications, while Hao et al. (2024) discussed the importance of addressing risks associated with generative AI. Celik (2023) likewise emphasized that ethical considerations must accompany teachers' technological and pedagogical knowledge.

3.2.5 Human-Centered Education

Human-Centered Education recorded an overall mean of 3.97 (SD = 0.68), interpreted as a high level of self-efficacy. Recognizing human responsibility for AI bias obtained the highest mean of 4.07, followed by evaluating AI-related risks (M = 3.98) and benefits (M = 3.93). Explaining AI's societal implications received the lowest mean of 3.89. These findings suggest that teachers generally recognized the importance of human responsibility and critical evaluation in AI-supported education. Nguyen et al. (2023) emphasized the importance of human-centered approaches that prioritize educational values and learner welfare. Nguyen et al. (2023) also highlighted ethical principles associated with AI, including transparency, accountability, fairness, privacy, and human agency. These perspectives reinforce the importance of maintaining human oversight and ethical judgment when integrating AI into instruction.

3.2.6 Professional Engagement

Professional Engagement obtained an overall mean of 3.94 (SD = 0.60), indicating a high level of self-efficacy. Seeking continuous professional development opportunities received the highest mean of 4.04, followed by sharing AI-related teaching experiences with colleagues (M = 3.93). Searching for suitable AI tools and assisting colleagues in designing AI-supported learning activities both obtained means of 3.89. The findings demonstrate teachers' favorable perceptions of their ability to participate in professional learning and collaboration. Chiu et al. (2024) recognized professional engagement as an important component of AI competence self-

efficacy. Yang et al. (2024) emphasized the contribution of collaborative professional development to teachers' confidence, while Ding et al. (2024) highlighted the value of practice-oriented learning experiences. These findings support peer mentoring, resource sharing, and collaborative instructional planning.

3.2.7 Overall AI Competence Self-Efficacy

All six dimensions of AI Competence Self-Efficacy received Agree ratings, indicating consistently high perceived confidence among respondents. AI Pedagogy obtained the highest mean (M = 4.01, SD = 0.79), followed by Human-Centered Education (M = 3.97, SD = 0.68), Professional Engagement (M = 3.94, SD = 0.60), AI Knowledge (M = 3.93, SD = 0.75), AI Ethics (M = 3.81, SD = 0.84), and AI Assessment (M = 3.69, SD = 0.76). The findings indicate that teachers perceived themselves as most confident in AI-supported instructional practices and least confident in AI-based assessment. Chiu et al. (2024) emphasized the multidimensional nature of teachers' AI competence self-efficacy, while Yang et al. (2024) highlighted the importance of professional development in strengthening AI-related instructional confidence. Consequently, the proposed Professional Development Plan may prioritize assessment-related competencies while maintaining teachers' strengths in pedagogy, ethical practice, and professional engagement.

3.3 Level of Attitudes Toward Artificial Intelligence

3.3.1 Interest

Interest in AI obtained an overall mean of 4.03 (SD = 0.59), interpreted as Agree. Respondents expressed the strongest agreement with their willingness to use new technologies after receiving training (M = 4.31). Their motivation to explore AI's potential and evaluate its applications in curriculum development both obtained means of 4.00. Interest in AI as an important field of study received a mean of 3.93.The findings indicate that respondents generally demonstrated favorable interest in AI and willingness to engage in technology-related professional learning. Uygun (2024) emphasized the importance of teachers' interest and readiness in adopting AI technologies. These findings suggest that structured training opportunities may help translate teachers' interest into practical instructional applications.

3.3.2 Intention to Use

Intention to Use AI obtained an overall mean of 3.99 (SD = 0.65), indicating a favorable attitude. Using AI for instructional warm-up activities received the highest mean of 4.09, followed by employing AI-supported systems to evaluate educational materials (M = 4.07). Using AI tutoring systems for post-teaching activities obtained a mean of 3.98, while adaptive learning applications and AI-powered tutoring platforms received means of 3.93 and 3.87, respectively. The results suggest that respondents were generally willing to incorporate AI into different instructional activities. Kong et al. (2024) identified perceived usefulness, self-efficacy, and attitudes as important considerations influencing teachers' intentions to use generative AI. Velli and Zafiropoulos (2024) likewise emphasized the role of perceived usefulness in technology acceptance. These findings support providing practical opportunities for teachers to apply AI in lesson preparation, instructional delivery, and learning activities.

3.3.3 Ethical Concern

Ethical Concern obtained an overall mean of 4.07 (SD = 0.69), interpreted as Agree. The strongest agreement concerned the belief that AI would not replace teachers (M = 4.62). Respondents also

agreed that AI could improve evaluation efficiency (M = 4.18), that AI was not a threat to TVE education (M = 4.16), and that appropriate standards could reduce AI-related risks (M = 4.04). The lowest means concerned AI-supported plagiarism detection (M = 3.69) and the effects of AI on learners' critical thinking (M = 3.73). The findings reflect generally favorable perceptions of AI's role in education while recognizing concerns involving academic integrity and learner development. Yim and Wegerif (2024) emphasized the importance of considering AI's educational implications and its relationship with human learning. These findings reinforce the need to address responsible AI use, academic integrity, and critical thinking within professional development activities.

3.3.4 Usefulness for Teachers

Usefulness for Teachers obtained the highest overall attitude score (M = 4.21, SD = 0.59), interpreted as Strongly Agree. Respondents strongly agreed that AI could support multimedia content presentation (M = 4.29), meaningful learning activities (M = 4.27), effective teaching strategies (M = 4.24), and access to updated instructional information (M = 4.24). Providing real-time feedback received the lowest mean of 4.00, although it remained within the Agree category. The findings indicate that respondents strongly recognized AI's potential benefits for instructional preparation and delivery. Davis (1989) identified perceived usefulness as a central factor influencing technology acceptance. Similarly, Kong et al. (2024) emphasized the relationship between perceived usefulness and teachers' intentions to adopt generative AI. These findings suggest that teachers' favorable perceptions of AI's instructional value provide a foundation for further professional learning.

3.3.5 Usefulness for Learners

Usefulness for Learners recorded an overall mean of 3.62 (SD = 0.63), interpreted as Agree but representing the lowest-rated attitude dimension. Respondents agreed that technological advancements could support personalized instruction (M = 4.09), motivate learners to improve their knowledge and skills (M = 3.84), facilitate self-paced learning (M = 3.80), and enable progress monitoring (M = 3.78). However, negatively worded statements concerning AI's ability to meet diverse learning needs (M = 3.24) and its use as a supplementary learning tool (M = 2.98) received Undecided ratings. The findings indicate that respondents recognized several potential learner-centered benefits of AI but expressed less certainty regarding its applicability to diverse learning needs and supplementary instruction. Ng et al. (2024) emphasized the importance of learning experiences that support students' educational development. These findings suggest that professional development should strengthen teachers' understanding of how AI can support personalized, inclusive, and competency-based learning in TVE.

3.3.6 Overall Attitudes Toward AI

Respondents generally demonstrated favorable Attitudes Toward Artificial Intelligence across all five dimensions. Usefulness for Teachers received the highest mean (M = 4.21, SD = 0.59), followed by Ethical Concern (M = 4.07, SD = 0.69), Interest (M = 4.03, SD = 0.59), Intention to Use (M = 3.99, SD = 0.65), and Usefulness for Learners (M = 3.62, SD = 0.63). Four dimensions were rated Agree, while Usefulness for Teachers was rated Strongly Agree. The findings suggest that respondents perceived AI as particularly beneficial for their professional responsibilities, although its learner-centered applications were comparatively less established. These results are consistent with Davis (1989), whose Technology Acceptance Model emphasizes perceived

usefulness in technology adoption, and Venkatesh et al. (2003), whose Unified Theory of Acceptance and Use of Technology recognizes factors influencing technology acceptance. Velli and Zafiropoulos (2024) likewise emphasized perceived usefulness as an important determinant of favorable Attitudes Toward AI. These findings support professional development emphasizing the practical benefits of AI for both teachers and learners.

3.4 Relationship Between AI Competence Self-Efficacy and Attitudes Toward Artificial Intelligence

The Pearson Product-Moment Correlation analysis revealed a strong positive and statistically significant relationship between AI Competence Self-Efficacy and Attitudes Toward AI among the respondents ($r = 0.691$, $p < .001$). Since the obtained probability value was below the 0.05 significance level, the null hypothesis of no significant relationship was rejected. The findings indicate that teachers reporting higher confidence in performing AI-related tasks also tended to demonstrate more favorable Attitudes Toward AI. The findings are consistent with Chiu et al. (2025), who identified a positive relationship between teachers' AI self-efficacy and Attitudes Toward AI among 524 preschool and primary school educators. Similarly, Darko et al. (2026) reported a strong association between teachers' AI integration self-efficacy and favorable attitudes toward generative AI ($r = .75$, $p < .001$), alongside a positive relationship between AI competence and attitudes ($r = .69$, $p < .001$). Erol et al. (2025) also examined the relationship among teachers' AI attitudes, AI self-efficacy, and AI technological pedagogical content knowledge, providing additional research context for understanding the interconnected nature of these constructs in educational settings. Chiu et al. (2025) further emphasized the importance of AI knowledge, pedagogy, assessment, ethics, human-centered education, and professional engagement in understanding teachers' AI-related capabilities. The present findings therefore support the relevance of addressing both perceived competence and attitudes within professional development initiatives. Overall, the study demonstrated that TVE teachers at Abellana National School possessed high AI Competence Self-Efficacy and generally favorable Attitudes Toward AI. However, AI Assessment and Usefulness for Learners emerged as comparatively less developed dimensions. The statistically significant positive relationship between the principal variables provides an empirical basis for proposing a Professional Development Plan focused on AI-supported assessment, learner-centered applications, ethical and responsible AI use, and sustained professional engagement.

4. CONCLUSIONS AND RECOMMENDATIONS

The study concluded that Technology and Vocational Education (TVE) teachers at Abellana National School demonstrated high levels of Artificial Intelligence (AI) Competence Self-Efficacy across all six dimensions, with AI Pedagogy emerging as the strongest area and AI Assessment as the least developed. Respondents also exhibited favorable Attitudes Toward AI, particularly regarding its usefulness for teachers, while its usefulness for learners received the lowest rating. These findings indicate the need to strengthen teachers' understanding of AI-supported assessment, personalized learning, supplementary instruction, and learner progress monitoring. Furthermore, a strong positive and statistically significant relationship was established between AI Competence Self-Efficacy and Attitudes Toward AI, indicating that teachers with greater perceived confidence in performing AI-related tasks tended to demonstrate more favorable attitudes. However, this relationship does not establish causation. Overall, the findings support the development of a Professional Development Plan that builds on teachers' existing strengths while addressing identified competency gaps.

It is recommended that Abellana National School adopt the proposed Professional Development Plan for TVE teachers to strengthen their AI Competence Self-Efficacy and promote favorable Attitudes Toward AI integration in education. The plan should prioritize AI-supported assessment, learner-centered applications, personalized and self-paced learning, ethical and responsible AI use, and human-centered instructional practices while sustaining teachers' existing competencies. Through structured professional development, teachers may further enhance their ability to integrate AI appropriately into teaching, assessment, and learning activities.

The study was limited to TVE teachers at Abellana National School and employed a descriptive-correlational research design based on respondents' self-reported AI Competence Self-Efficacy and Attitudes Toward AI. Consequently, the findings describe perceived competence rather than objectively measured AI proficiency, and the observed relationship between the variables cannot establish causation. The findings should therefore be interpreted within the specific institutional context of the study.

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