

Evaluating Teachers' Competency to Incorporate Artificial Intelligence in Developing Educational Materials

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Abstract

This study evaluated teachers' competency in incorporating Artificial Intelligence (AI) in developing educational materials at Saint Estandislaos Kostka College Incorporated. Anchored on the Technology Acceptance Model (TAM), Shulman's Pedagogical Content Knowledge (PCK), and Continuous Professional Development (CPD), the study examined teachers' professional engagement, instructional support, content choices across disciplines, and students' learning competencies in AI-assisted instructional material development. A descriptive-quantitative research design was employed using purposive sampling among teacher-respondents during the Academic Year 2023–2024. Data were collected through an adapted questionnaire utilizing a five-point Likert scale and analyzed using frequency count, percentage, weighted mean, and Factorial Multivariate Analysis of Variance (MANOVA). The findings revealed that teachers demonstrated a very competent level of AI competency across all assessed dimensions, indicating strong professional engagement, effective instructional support, appropriate content selection across disciplines, and the ability to promote students' learning competencies through AI-assisted educational materials. The analysis further showed no significant differences in competency when grouped according to sex and educational attainment. Overall, the study concludes that teachers possess the competencies necessary to integrate AI responsibly, ethically, and effectively in instructional material development. It recommends strengthening continuous professional development, implementing systematic review processes for AI-generated instructional materials, enhancing institutional support, and expanding future studies through larger populations and additional variables. The study aligns primarily with Sustainable Development Goal (SDG) 4 – Quality Education by supporting teacher competency and instructional quality, while also contributing to SDG 9 – Industry, Innovation and Infrastructure, SDG 10 – Reduced Inequalities, and SDG 17 – Partnerships for the Goals through responsible AI integration and collaborative educational innovation. By strengthening teachers' AI competencies, the study contributes to educational, institutional, technological, and community sustainability through the responsible and ethical use of AI in teaching and learning.

Keywords: Artificial Intelligence, Educational Materials, Instructional Support, Professional Engagement, Students' Learning Competencies, Teacher Competency, Technology Acceptance Model (TAM), Technological Pedagogical Content Knowledge (TPACK)

1. Introduction

Artificial Intelligence (AI) has emerged as a transformative technology that is reshaping educational practices, particularly in the design and development of instructional materials. AI enables teachers to personalize instruction, improve learning accessibility, generate instructional resources efficiently, and provide timely feedback to learners. As AI applications continue to evolve, teachers are expected not only to use these technologies but also to evaluate their outputs critically, align them with curriculum standards, and ensure ethical, accurate, and learner-centered implementation. Consequently, teachers' competency in incorporating AI into educational material development has become an important concern for educational institutions and policymakers (Luckin et al., 2016; UNESCO, 2023). Despite the increasing availability of AI tools in education, effective integration depends largely on teachers' professional competencies, including technological knowledge, pedagogical expertise, ethical awareness, and continuous professional learning. Understanding these competencies is essential for ensuring that AI supports rather than replaces sound instructional practices. This study therefore evaluates teachers' competency to incorporate Artificial Intelligence in developing educational materials to identify existing strengths, competency gaps, and areas for professional development that can support responsible, innovative, and sustainable educational practices.

1.1 Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials

Artificial Intelligence has significantly transformed educational environments by supporting instructional planning, content creation, assessment, adaptive learning, and personalized instruction. Rather than functioning solely as an emerging

technology, AI has become an instructional support system capable of improving accessibility, flexibility, efficiency, and learner engagement. AI-powered educational systems can generate personalized learning experiences, provide immediate feedback, and assist teachers in producing data-informed instructional materials that accommodate diverse learning needs (Luckin et al., 2016; Holmes et al., 2019). The effectiveness of AI integration, however, depends primarily on teachers' competencies rather than on the technology itself. Teachers must understand AI applications, evaluate AI-generated outputs for curriculum alignment, modify instructional materials according to learner needs, and ensure ethical practices involving fairness, privacy, academic integrity, and responsible AI use. UNESCO (2023) emphasized that generative AI should promote learner agency, equity, and human-centered education while preserving the professional role of teachers. Consequently, AI serves as an instructional support tool that complements rather than replaces teachers' pedagogical expertise. Successful technology integration has consistently been associated with teachers' beliefs, attitudes, knowledge, and instructional practices. Earlier studies emphasized that technology adoption requires positive beliefs alongside appropriate pedagogical practices and institutional support. Similarly, teachers' pedagogical beliefs substantially influence successful technology integration (Tondeur et al., 2017). The emergence of AI extends these requirements by demanding competencies in AI-assisted content generation, instructional decision-making, data interpretation, ethical evaluation, and instructional design. Although studies have extensively examined educational technology integration, relatively limited evidence exists regarding teachers' preparedness and competency to incorporate AI specifically in developing educational materials. This gap is particularly significant because instructional materials directly influence curriculum implementation and student learning. Inadequate AI competency may result in inaccurate, biased, or contextually inappropriate educational resources that fail to meet curriculum objectives and learners' needs. Consequently, assessing teachers' competency in AI integration is necessary to support effective instructional practice, guide professional development initiatives, and strengthen responsible AI implementation within educational settings.

1.2 Related Literature on Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials

The literature consistently identifies AI as a transformative force that enhances teaching effectiveness through adaptive instruction, personalized learning, intelligent tutoring, automated assessment, and data-driven instructional support. AI systems utilize machine learning, data analytics, and natural language processing to identify learner needs and create adaptive learning environments that improve educational experiences (Siemens, 2013; Luckin et al., 2016). Ouyang and Jiao (2021) further explained that AI in education has evolved through distinct paradigms, progressing from AI-directed learning to AI-supported learning and ultimately toward AI-empowered learning, where teachers and learners collaborate with AI to enhance educational outcomes. AI also supports inclusive and flexible learning by responding to diverse learner characteristics while extending opportunities for individualized instruction (Johnson et al., 2020). Researchers emphasize that the educational value of AI depends largely on teachers' competencies rather than the technology itself. Effective AI integration requires teachers to combine technological knowledge with sound pedagogical and content expertise. The TPACK framework highlights the importance of integrating technology, pedagogy, and content knowledge to maximize instructional effectiveness (Koehler and Mishra, 2009). Likewise, teachers must continually adapt their instructional practices to keep pace with evolving AI technologies (Ertmer et al., 2012). Continuous professional development is repeatedly identified as a critical requirement for successful AI implementation. Teachers are encouraged to engage in lifelong learning, participate in professional training, and develop adaptive mindsets that enable them to respond to emerging technological innovations (Gulbahar, 2018; Johnson et al., 2020; Smith and Brown, 2019). Beyond technical proficiency, AI literacy requires teachers to understand AI capabilities, evaluate AI-generated content critically, apply ethical principles, and integrate AI meaningfully into teaching and learning (Holstein et al., 2019). Several theoretical and practical frameworks further explain teachers' AI competency. The TPACK framework provides a comprehensive basis for evaluating teachers' ability to integrate technology, pedagogy, and content knowledge when using AI (Koehler & Mishra, 2009). Together, these frameworks emphasize that meaningful AI integration extends beyond technological adoption toward pedagogically informed instructional innovation. The literature further demonstrates that AI competency includes the ability to design personalized learning experiences, develop adaptive instructional resources, evaluate AI-generated materials, and modify content according to learners' diverse needs. Teachers must also integrate ethical considerations, promote digital literacy, and ensure that AI-supported learning materials remain inclusive, culturally appropriate, and aligned with curriculum standards (Vlasova et al., 2019; UNESCO, 2023). Professional learning experiences significantly strengthen teachers' readiness for AI integration. Continuous learning opportunities, collaborative professional communities, reflective practice, and institutional support enable teachers to adapt to rapidly changing AI technologies while maintaining effective pedagogical practices (Markauskaite et al., 2022). Furthermore, studies indicate that successful AI implementation requires balancing technological innovation with meaningful learner-instructor interactions, collaborative learning environments, and human-centered instructional approaches (Seo et al., 2016; Dillenbourg, 1999; Anderson & Dron, 2011). The Community of Inquiry perspective emphasizes that effective online and technology-enhanced learning depends on the meaningful interaction of cognitive, social, and teaching presence, highlighting the continuing importance of human engagement in AI-supported educational environments (Anderson & Dron, 2011). Overall, the reviewed literature consistently indicates that effective AI integration depends on teachers' professional engagement, instructional competence, pedagogical knowledge, ethical decision-making, continuous

professional development, and the ability to design learner-centered educational materials. These findings provide a strong foundation for evaluating teachers' competency to incorporate Artificial Intelligence in developing educational materials and identifying areas requiring further professional support.

1.3 Global, National, and Local Context of Artificial Intelligence Integration in Developing Educational Materials

The integration of Artificial Intelligence (AI) in education has become a global priority as educational institutions seek innovative approaches to improve teaching, learning, and instructional resource development. Internationally, AI has transformed education by supporting adaptive learning, personalized instruction, automated assessment, intelligent tutoring systems, and data-informed decision-making, enabling more responsive and learner-centered educational environments (Luckin et al., 2016; Johnson et al., 2020; Holstein et al., 2019). Global organizations likewise emphasize that AI should be implemented responsibly to promote equitable, ethical, and inclusive education while preserving teachers' central role in the teaching-learning process (UNESCO, 2023). At the national level, the rapid expansion of digital technologies has increased expectations for teachers to acquire competencies necessary for integrating AI into instructional planning and educational material development. Contemporary educational reforms encourage teachers to strengthen their technological, pedagogical, and ethical competencies through continuous professional development to ensure that AI applications enhance instructional quality rather than merely automate classroom tasks (Gulbahar, 2018; Johnson et al., 2020; Markauskaite et al., 2022). Within local educational institutions, AI integration presents opportunities to improve instructional delivery while simultaneously creating challenges related to teacher preparedness, resource availability, institutional support, and professional training. Teachers are expected to critically evaluate AI-generated instructional materials, adapt them to learners' diverse needs, and ensure curriculum alignment, inclusivity, and ethical use. Consequently, schools require evidence regarding teachers' competencies to guide institutional planning, professional development initiatives, and policy implementation that support responsible AI adoption. These global, national, and local developments demonstrate that effective AI integration depends not only on technological advancement but also on teachers' competencies, institutional readiness, and collaborative support systems capable of sustaining innovation in educational practice.

1.4 Theoretical and Conceptual Basis of Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials

The study is anchored on complementary theories and frameworks that explain teachers' competency in integrating Artificial Intelligence into the development of educational materials. The primary theoretical foundation is the Technology Acceptance Model (TAM), which proposes that individuals are more likely to adopt emerging technologies when they perceive them as useful and easy to use. In the context of AI integration, teachers' willingness to utilize AI depends on their perceptions of its instructional value, accessibility, and potential to improve educational outcomes. Accordingly, evaluating teachers' competency requires examining both their acceptance of AI technologies and their ability to apply these technologies effectively in instructional material development. The study also draws upon Shulman's Pedagogical Content Knowledge (PCK), which emphasizes the integration of pedagogical expertise and subject matter knowledge in designing meaningful learning experiences. Within AI-supported instruction, PCK highlights teachers' capacity to utilize AI tools in ways that enhance curriculum delivery, improve learner engagement, and address instructional needs while maintaining sound pedagogical principles. Continuous Professional Development (CPD) further strengthens this theoretical foundation by emphasizing lifelong learning as an essential component of AI competency. Because AI technologies evolve rapidly, teachers require ongoing professional learning through formal training, collaborative learning communities, reflective practice, and practical experiences that enable them to adapt confidently to emerging educational technologies. The conceptual framework of the study reflects these theoretical perspectives by examining teachers' competency across four interrelated dimensions: teachers' professional engagement, instructional support, content choices across disciplines, and students' learning competencies. These dimensions collectively represent teachers' readiness to integrate AI effectively, ethically, and pedagogically in developing educational materials while considering individual teacher characteristics such as sex and educational attainment.

1.5 Research Gaps on Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials

Existing literature consistently demonstrates the educational potential of Artificial Intelligence in improving personalized learning, instructional efficiency, adaptive teaching, and learner engagement (Luckin et al., 2016; Johnson et al., 2020; Holstein et al., 2019). Numerous studies have likewise examined technology integration frameworks, AI literacy, teacher professional development, and pedagogical approaches for AI-supported education (Koehler & Mishra, 2009). Despite these advances, limited empirical evidence specifically evaluates teachers' competency to incorporate AI in developing educational materials. Much of the existing literature focuses on technology adoption, AI applications, or instructional innovation rather than examining teachers' professional engagement, instructional support, content selection across disciplines, and promotion of students' learning competencies as integrated dimensions of AI competency. Furthermore, previous studies emphasize the importance of continuous professional development and institutional support but provide limited evidence regarding teachers' actual preparedness and competency in producing AI-assisted instructional resources (Gulbahar, 2018; Johnson et al., 2020; Markauskaite et al., 2022). The increasing reliance on AI-generated educational

materials also raises concerns regarding instructional accuracy, curriculum alignment, ethical use, learner diversity, bias, privacy, and responsible implementation. Without adequate teacher competency, AI-generated materials may fail to address educational objectives or learners' contextual needs. Consequently, systematic evaluation of teachers' competencies is necessary to identify professional development needs, strengthen institutional support mechanisms, and promote responsible AI integration in educational practice. Addressing these gaps, the present study evaluates teachers' competency to incorporate Artificial Intelligence in developing educational materials by examining teachers' professional engagement, instructional support, content choices across disciplines, and students' learning competencies. The findings are expected to provide evidence that supports curriculum development, teacher capacity-building initiatives, institutional planning, and policy formulation for the responsible and sustainable integration of AI in education.

1.6 Alignment of Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials with the Sustainable Development Goals (SDGs)

This study aligns with several Sustainable Development Goals (SDGs) by examining teachers' competency to incorporate Artificial Intelligence (AI) in developing educational materials. The most direct alignment is with SDG 4 – Quality Education, which promotes inclusive, equitable, and quality education as well as lifelong learning opportunities for all. Evaluating teachers' competency in AI integration contributes to strengthening teacher preparedness, improving instructional quality, supporting learner-centered education, and enhancing access to quality educational resources through responsible AI implementation (United Nations, 2015; UNESCO, 2023; UNESCO, 2024). The study also supports SDG 9 – Industry, Innovation and Infrastructure by encouraging innovation in educational practice through the effective integration of AI into instructional design and curriculum development. Teachers who possess the competencies to evaluate, adapt, and responsibly utilize AI contribute to the development of innovative and resilient educational systems capable of responding to rapidly changing technological environments (United Nations, 2015; Vinuesa et al., 2020). In addition, the study relates to SDG 10 – Reduced Inequalities, as competent AI integration can promote equitable access to instructional resources that accommodate diverse learner needs while minimizing bias and improving accessibility. Teachers play a crucial role in ensuring that AI-generated educational materials remain inclusive, culturally appropriate, and responsive to varying learning contexts (UNESCO, 2023; UNESCO, 2024). Furthermore, the study supports SDG 17 – Partnerships for the Goals by recognizing that successful AI integration requires collaboration among teachers, school administrators, curriculum developers, policymakers, technology specialists, and other educational stakeholders. Strengthening teachers' AI competency therefore contributes to collaborative institutional efforts that promote sustainable educational innovation (United Nations, 2015; Vinuesa et al., 2020). Recent literature reinforces these SDG linkages by emphasizing that AI can enhance instructional planning, assessment, feedback, and professional development when teachers possess appropriate competencies and apply AI within ethical and pedagogically sound practices (Celik et al., 2022; Zawacki-Richter et al., 2019; Crompton and Burke, 2023).

1.7 Importance of Teachers' Competency in Incorporating Artificial Intelligence in Developing Educational Materials to Multidisciplinary Sustainability

The study contributes primarily to educational sustainability by strengthening teachers' competencies in integrating AI responsibly into instructional material development. Competent educators are better equipped to design learner-centered, curriculum-aligned, and inclusive educational resources that respond to diverse student needs while maintaining instructional quality and professional accountability. The study also contributes to technological and innovation sustainability by promoting teachers' capacity to adopt emerging AI technologies through continuous professional development, ethical decision-making, and evidence-based instructional practices. Enhancing AI competency enables educational institutions to adapt to technological advancements while ensuring that innovation supports meaningful teaching and learning rather than technology-driven instruction alone. From a socio-economic sustainability perspective, strengthening teachers' AI competencies supports workforce readiness by preparing learners with digital competencies required in increasingly technology-driven societies. Improving instructional quality through responsible AI integration contributes to developing graduates who possess the knowledge and skills necessary to participate effectively in the digital economy. The study likewise supports institutional and policy sustainability by providing evidence that may guide professional development programs, curriculum enhancement, institutional planning, and educational policies related to AI implementation. Identifying teachers' competency levels and areas requiring further support enables educational leaders to design targeted interventions that strengthen responsible AI integration across educational systems. Finally, the study contributes to community sustainability by promoting equitable, ethical, and inclusive educational practices that benefit teachers, learners, educational institutions, and the broader community. Responsible AI integration enhances teaching effectiveness while preserving the essential human role of educators in facilitating meaningful learning experiences. Through strengthened teacher competency, educational institutions become better positioned to sustain innovation, improve instructional quality, and respond effectively to the evolving demands of digital education.

2. Material and methods

2.1 Research Design

The study employed a descriptive-quantitative research design to assess teachers' competency in incorporating Artificial Intelligence in developing educational materials. This design was appropriate because it allowed the collection, organization, analysis, and interpretation of numerical data to describe the current status of teachers' competencies. It also enabled the examination of relevant variables to provide an objective evaluation of teachers' preparedness and capabilities in integrating AI into instructional material development.

2.2 Locale of the Study

The study was conducted at Saint Estanislao Kostka College Incorporated in Manukan, Zamboanga del Norte. As the only private educational institution in the municipality, the college serves as an appropriate setting for evaluating teachers' competency in incorporating Artificial Intelligence into educational material development. Assessing teachers' competencies within this institution provides valuable information on the integration of AI in instructional practices and supports the enhancement of innovative teaching strategies that respond to the demands of digital education.

2.3 Respondents of the Study

The respondents were teachers of Saint Estanislao Kostka College Incorporated during the Academic Year 2023–2024. They were selected because they are directly involved in instructional planning, teaching, and the development of educational materials, making them appropriate participants for evaluating teachers' competency in incorporating Artificial Intelligence into instructional resource development.

2.4 Sample and Sampling Procedure

The study utilized purposive sampling in selecting the respondents. This sampling technique was employed to identify teachers who could provide relevant information regarding the integration of Artificial Intelligence in developing educational materials. By focusing on teachers from Saint Estanislao Kostka College Incorporated, the study obtained data from participants whose professional experiences and instructional responsibilities were directly related to the objectives of the research.

2.5 Research Instrument

The study utilized an adapted questionnaire as the primary research instrument. The instrument consisted of two parts. The first part gathered the respondents' demographic profile, while the second assessed teachers' competency in incorporating Artificial Intelligence in developing educational materials. The questionnaire employed a five-point Likert scale to measure respondents' perceptions. Before data collection, the instrument underwent consultation with the research adviser, and necessary revisions were made to improve its content validity and suitability for the study.

2.6 Data Gathering Procedure

Prior to data collection, the researcher secured approval from the Dean of the College of Education of Saint Estanislao Kostka College Incorporated. An endorsement letter accompanied the request for permission to conduct the study. Upon approval, the researcher personally administered the questionnaires to the teacher-respondents. After the respondents completed the instrument, the questionnaires were collected, and the responses were organized, tallied, computed, and interpreted for data analysis.

2.7 Data Analysis Techniques

The collected data were analyzed using appropriate descriptive and inferential statistical techniques. Frequency count and percentage were used to describe the respondents' characteristics in terms of sex and educational attainment. Weighted mean was employed to determine the level of teachers' competency in incorporating Artificial Intelligence in developing educational materials. Factorial Multivariate Analysis of Variance (MANOVA) was used to determine whether significant differences existed in teachers' competency levels when grouped according to their profile variables.

2.8 Ethical Considerations

The study adhered to ethical principles throughout the research process by protecting the confidentiality and privacy of all participants. Respondents were informed about the purpose of the study and were invited to participate voluntarily. They were assured that their identities and responses would remain confidential and would be used solely for research purposes. Participants were informed of their right to withdraw from the study at any stage without penalty. The researcher conducted the study with honesty, fairness, and respect while ensuring that all approved ethical procedures were observed during data collection, analysis, and reporting.

3. Results and Discussion

3.1 Main Findings

3.1.1 Teachers' Characteristics

The respondents consisted of 17 teachers, with female teachers slightly outnumbering male teachers. Most respondents were holders of a bachelor's degree, while a smaller proportion had completed a master's degree. No respondent held a doctorate degree. These findings indicate that the participants represented teachers with varying academic backgrounds, providing an appropriate basis for examining differences in AI competency according to sex and educational attainment. The respondents' profile suggests that teachers possess different levels of academic preparation that may influence their exposure to educational technology, research-based pedagogy, and digital competencies. Previous studies have emphasized that teachers' readiness to integrate technology may vary according to professional experiences and digital competence (Tondeur et al., 2017). Likewise, teachers' professional preparation supports the ethical and pedagogically appropriate use of AI in education (UNESCO, 2023).

3.1.2 Teachers' Professional Engagement in Incorporating Artificial Intelligence

The findings revealed that teachers demonstrated a very competent level of professional engagement in incorporating Artificial Intelligence in developing educational materials. Respondents consistently reported participating in professional development activities, engaging in professional learning communities, following ethical guidelines, reflecting on AI's influence on teaching, remaining updated on AI developments, advocating responsible AI use, collaborating with colleagues, and utilizing AI for continuous professional growth. Overall, the results indicate that teachers actively engage in professional practices that strengthen their competency in AI integration. The findings suggest that teachers recognize the importance of continuous professional learning and responsible AI implementation in improving instructional practices. This result supports the study of Celik et al. (2022), which found that AI enhances teachers' professional roles by supporting curriculum development, instructional innovation, and professional growth. These findings indicate that sustained professional engagement strengthens teachers' ability to integrate AI effectively while supporting continuous instructional development.

3.1.3 Instructional Support for Artificial Intelligence Integration

The findings indicated that teachers demonstrated a very competent level of instructional support in incorporating Artificial Intelligence into developing educational materials. Respondents reported effectively using AI to provide personalized learning experiences, identify instructional needs through AI analytics, align AI tools with pedagogical objectives, deliver immediate feedback, support inclusive learning environments, facilitate collaborative learning, evaluate the effectiveness of AI applications, encourage independent learning, and promote equitable access to AI-supported instructional resources. Overall, the results show that teachers are capable of utilizing AI to enhance instructional delivery and learner support. These findings suggest that teachers recognize AI as an instructional tool that improves teaching effectiveness while supporting learner-centered education. These findings suggest that teachers recognize AI as an instructional tool that improves teaching effectiveness while supporting learner-centered education.

3.1.4 Content Choices Across Disciplines in Artificial Intelligence-Supported Educational Materials

The findings revealed that teachers exhibited a very competent level of competency in selecting and developing AI-supported instructional content across disciplines. Respondents indicated that they consistently evaluated AI-generated content for accuracy, authenticity, and potential bias; integrated AI resources to address curricular needs; selected engaging instructional materials; adapted AI-generated content to learners' diverse needs and cultural contexts; promoted interdisciplinary learning; utilized AI resources appropriate to their subject areas; incorporated ethical discussions regarding AI; and supported the development of students' digital literacy. These findings demonstrate teachers' ability to make informed and responsible decisions when utilizing AI-generated educational materials across different learning areas. The results indicate that teachers understand the importance of critically evaluating AI-generated instructional resources before classroom implementation. Their ability to adapt AI-generated materials according to curriculum requirements and learner diversity reflects the growing emphasis on ethical, learner-centered, and pedagogically appropriate AI integration. These findings are consistent with the literature emphasizing that successful AI integration requires teachers to possess technological, pedagogical, and content knowledge while ensuring that AI-generated materials remain accurate, relevant, inclusive, and ethically appropriate (UNESCO, 2023).

3.1.5 Students' Learning Competencies Supported by Artificial Intelligence

The findings showed that teachers demonstrated a very competent level in utilizing Artificial Intelligence to promote students' learning competencies. Teachers indicated that AI-supported educational materials enhanced students' engagement, encouraged independent learning, strengthened critical thinking, facilitated personalized instruction, improved digital literacy, and supported the development of knowledge and skills required for contemporary learning environments. Overall, the results suggest that teachers effectively employ AI to foster meaningful student learning experiences while addressing diverse learner needs. The findings imply that teachers recognize the potential of AI to

improve learner outcomes when integrated within sound pedagogical practices. Effective AI implementation enables teachers to personalize instruction, respond to individual learning differences, and enhance student participation in the learning process. These findings support previous studies emphasizing that AI-assisted instructional strategies improve learner engagement, adaptive learning, and educational effectiveness when teachers possess the necessary competencies to integrate AI responsibly and meaningfully (Johnson et al. (2020); Holstein et al. (2019); Hwang, 2020).

3.2 Differences in Teachers' Competency According to Profile Variables

3.2.1 Differences According to Sex

The analysis revealed that there was no significant difference in teachers' competency to incorporate Artificial Intelligence in developing educational materials when respondents were grouped according to sex. Both male and female teachers demonstrated comparable levels of competency across the assessed dimensions, indicating that AI competency was not influenced by gender. This finding suggests that opportunities for developing AI-related competencies are accessible to both male and female teachers, resulting in similar levels of preparedness for AI integration. The result supports previous studies emphasizing that effective technology integration depends more on professional learning, digital competence, and instructional experience than on gender differences (Guillén-Gámez et al., 2021; Tondeur et al., 2017).

3.2.2 Differences According to Educational Attainment

The findings likewise indicated no significant difference in teachers' competency to incorporate Artificial Intelligence in developing educational materials when respondents were grouped according to educational attainment. Teachers with bachelor's and master's degrees demonstrated comparable competency levels in integrating AI into instructional material development. The results imply that although academic qualifications contribute to teachers' professional preparation, competency in AI integration is also influenced by continuous professional development, practical experience, and institutional support. This finding is consistent with UNESCO (2023), which emphasizes that teachers require ongoing learning opportunities to develop ethical, pedagogical, and technological competencies necessary for responsible AI integration in education.

3.3 Overall Discussion of the Findings

The findings indicate that teachers possess a generally high level of competency in incorporating Artificial Intelligence in developing educational materials. They demonstrated strong professional engagement, provided effective instructional support, selected appropriate AI-assisted content across disciplines, and utilized AI to enhance students' learning competencies. Collectively, these findings suggest that teachers are prepared to integrate AI into instructional practices while maintaining learner-centered and ethically responsible approaches. The discussion affirms that effective AI integration extends beyond technological proficiency and requires a balanced combination of pedagogical knowledge, ethical awareness, instructional decision-making, and continuous professional learning. The findings are consistent with literature emphasizing that successful AI implementation depends on teachers' competencies in technology integration, instructional design, and lifelong professional development (Celik et al., 2022; UNESCO, 2023; UNESCO, 2024). The results further support the view that AI serves as a valuable instructional tool when teachers possess the competencies needed to evaluate, adapt, and apply AI-generated educational resources responsibly and effectively.

4. Conclusion & Recommendations

The study concluded that teachers of Saint Estanislao Kostka College Incorporated demonstrated a high level of competency in incorporating Artificial Intelligence (AI) in developing educational materials, particularly in professional engagement, instructional support, content choices across disciplines, and students' learning competencies. The findings also revealed that most respondents were female and bachelor's degree holders, and that teachers effectively utilized AI to support instructional planning and learner development. Furthermore, a significant difference was found in teachers' AI competency when grouped according to their characteristics, indicating that respondent characteristics influenced competency levels. Overall, the study highlights that responsible AI integration contributes to improving instructional quality, promoting innovation, supporting inclusive education, and advancing sustainable educational development.

The study recommends strengthening teachers' AI competency through continuous professional development programs that emphasize ethical AI use, curriculum alignment, instructional design, data privacy, and inclusive teaching practices. Schools are encouraged to establish AI training programs, implement systematic review processes for AI-generated instructional materials, and strengthen partnerships with higher education institutions, curriculum specialists, technology experts, and professional organizations to support responsible AI integration. Future researchers are likewise encouraged to involve larger populations and examine additional variables related to teachers' AI competency to further strengthen evidence on AI integration in education.

The study was limited to teachers of Saint Estanislao Kostka College Incorporated during the Academic Year 2023–2024

using a descriptive-quantitative design and purposive sampling. The respondents represented a relatively small population, and the investigation focused primarily on teachers' competency in incorporating Artificial Intelligence in developing educational materials based on selected profile variables. Consequently, the findings are limited to the context of the participating institution and may not be generalized to other educational settings without further investigation involving larger populations and additional variables.

Compliance with ethical standards

This study was conducted in accordance with established ethical principles. The confidentiality and privacy of all participants were protected throughout the research process. Participation was voluntary, and respondents were informed of the purpose of the study, the confidentiality of their responses, and their right to withdraw at any time without penalty. The research was conducted with honesty, fairness, and respect, and ethical procedures were observed during data collection, analysis, and reporting.

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