PANTAO
(International Journal of the Humanities and Social Sciences)
Volume 5, Issue 3
ISSN 3028-0877 | e-ISSN 3155-6043 | DOI 10.69651/2022PIJHSS

Artificial intelligence in personalized learning: Investigating teachers' perspectives on AI-driven adaptive educational strategies to enhance student outcomes

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative innovation in education, enabling teachers to personalize instruction, improve student engagement, and enhance learning outcomes through adaptive educational strategies. As educational institutions increasingly integrate AI into classroom instruction, understanding teachers' perspectives regarding its effectiveness and implementation has become essential in developing appropriate professional development initiatives and ensuring the responsible adoption of AI technologies. This study aimed to determine teachers' perspectives on the use of Artificial Intelligence (AI)-driven adaptive educational strategies in personalized learning within a public-school district in southern Arizona, USA, during the School Year 2025–2026. Specifically, it examined the respondents' profile, the perceived effectiveness of AI-driven adaptive educational strategies, the effects of AI-aided teaching strategies on instruction, the relationships between AI strategies and teaching outcomes, and the challenges encountered in AI implementation. The findings served as the basis for the proposed Project AI-READY (Adaptive Instruction and Research-driven Educational Advancement for District Yield) Professional Development Program. The study employed a descriptive-correlational quantitative research design. A total of 60 general education teachers were selected through purposive sampling based on their experience and familiarity with AI-assisted instructional practices. Data were gathered using a researcher-made, validated questionnaire utilizing a five-point Likert scale. Descriptive statistics, including frequency, percentage, weighted mean, standard deviation, and rank, were used to describe the respondents and summarize their responses, while inferential statistics at the 0.05 level of significance were employed to determine the relationships among the variables. The findings revealed that most respondents were female, aged 41–50 years, had 16–20 years of teaching experience, were teaching Mathematics, and had attended one to two AI-related or educational technology training programs. Teachers perceived AI-driven adaptive educational strategies as Very Effective in enhancing student engagement, improving learning comprehension and retention, supporting classroom management and workload, promoting personalization and adaptive learning, increasing instructional efficiency, facilitating content creation, supporting AI-assisted learning, and fostering ethical AI use. Likewise, the overall effect of AI-aided teaching strategies on classroom instruction was interpreted as Very Effective. Correlation analysis further revealed statistically significant positive relationships between AI-driven adaptive educational strategies and teaching effectiveness, particularly in the areas of personalization, automation, and instructional content creation, while ethical AI use demonstrated comparatively weaker but still significant

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DOI: http://doi.org/10.69651/PIJHSS05031392

Recommended citation:
Alvarado, J. R. (2026). Artificial intelligence in personalized learning: Investigating teachers' perspectives on AI-driven adaptive educational strategies to enhance student outcomes. Pantao (International Journal of the Humanities and Social Sciences) 5 (3), 2205-2238. http://doi.org/10.69651/PIJHSS05031392

relationships. Despite these favorable findings, respondents identified several implementation challenges, with lack of training or knowledge in AI integration emerging as the most significant concern, followed by additional workload, limited technological infrastructure, student resistance, data privacy concerns, and limited institutional support. The study concludes that teachers generally hold positive perspectives toward the integration of AI-driven adaptive educational strategies and recognize their potential to enhance teaching effectiveness and student learning outcomes. However, the successful implementation of AI in education requires sustained professional development, adequate technological infrastructure, institutional support, and responsible AI governance. Based on the findings, the study proposed Project AI-READY (Adaptive Instruction and Research-driven Educational Advancement for District Yield), a comprehensive professional development program designed to strengthen teachers' competencies in AI integration, promote ethical and responsible AI use, and improve both instructional practices and student learning outcomes.

Keywords: Artificial Intelligence, AI-driven adaptive educational strategies, personalized learning, teacher perspectives, professional development, descriptive-correlational research, Arizona, United States.

Date Submitted: July 2, 2026
Date Accepted: July 14, 2026
Date Published: July 21, 2026

INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative innovations in contemporary education, fundamentally reshaping instructional delivery, assessment, learner support, and educational management. Through intelligent tutoring systems, adaptive learning platforms, predictive analytics, and generative AI applications, educators are increasingly able to personalize instruction, automate routine teaching responsibilities, deliver immediate feedback, and enhance students' overall learning experiences. As AI technologies continue to evolve, educational institutions worldwide recognize their capacity to promote learner centered instruction, improve instructional efficiency, and expand equitable access to quality education. Nevertheless, the successful realization of these benefits depends not only on technological advancement but also on the educators who implement these tools within authentic classroom settings. Teachers remain the primary facilitators of technology integration, making their perceptions and experiences central to understanding the effectiveness of AI supported educational innovation (Holmes et al., 2022; UNESCO, 2023; Zawacki Richter et al., 2019).

Although AI powered educational technologies continue to expand in availability and sophistication, their effectiveness ultimately depends on teachers' acceptance, readiness, instructional competence, and professional judgment. Artificial Intelligence functions not as an independent instructional solution but as a complementary educational resource whose value is shaped by teachers' ability to evaluate, adapt, and integrate AI generated instructional materials responsibly and effectively. Educators determine whether AI applications are implemented ethically, aligned with instructional goals, and capable of improving student learning outcomes. Extensive research consistently demonstrates that teachers' beliefs, attitudes, and perceptions significantly influence their willingness to adopt educational innovations and sustain technology integration in classroom practice. The Technology Acceptance Model explains that teachers are more likely to adopt AI when they perceive it as useful and easy to use, while the Unified Theory of Acceptance and Use of Technology similarly emphasizes the influence of performance expectancy, effort expectancy, social influence, and facilitating conditions on technology adoption. Complementing these perspectives, Rogers' Diffusion of Innovations Theory proposes that educators evaluate innovations according to their relative advantage, compatibility, complexity, trialability, and observability before deciding whether to integrate them into instructional practice (Davis, 1989; Rogers, 2003; Teo, 2011; Venkatesh et al., 2003). Collectively, these theoretical perspectives establish that teachers' perspectives serve as a critical determinant of the long term success of AI implementation within educational environments.

Teachers' perspectives encompass their professional beliefs, experiences, attitudes, judgments, and perceptions regarding the usefulness, effectiveness, practicality, and challenges associated with AI driven adaptive educational strategies. Investigating these perspectives extends beyond measuring opinions because it provides meaningful evidence regarding instructional readiness, implementation barriers, technology acceptance, and professional development needs grounded in authentic classroom experiences. Such perspectives enable educational leaders to understand how teachers evaluate the instructional value of AI technologies, identify implementation challenges, and determine the extent to which AI contributes to improved teaching and learning. This understanding provides an empirical basis for designing institutional policies, instructional interventions, and professional development initiatives that support responsible and effective AI integration in schools (Ertmer & Ottenbreit Leftwich, 2013; Mishra & Koehler, 2006; Tondeur et al., 2017).

Guiding this investigation is Constructivist Learning Theory, originally advanced by Jean Piaget and further developed by Lev Vygotsky, which serves as the principal theoretical foundation of the study. Constructivism views learning as an active process through which learners construct knowledge by integrating new experiences with existing cognitive structures rather than passively receiving information. Meaningful learning occurs when students engage in authentic learning experiences, inquiry, reflection, collaboration, and problem solving within supportive instructional environments (Chuang, 2021). This learner centered orientation closely aligns with the educational capabilities of AI driven adaptive technologies, which facilitate differentiated instruction, individualized learning pathways, immediate feedback, and responsive instructional support while preserving the teacher's central role as facilitator of meaningful learning experiences (Mohammed & Kinyo, 2020). Rather than replacing educators, AI complements constructivist pedagogy by enabling teachers to create more personalized, engaging, and responsive instructional environments that foster deeper knowledge construction.

The constructivist perspective provides a comprehensive explanation for the major dimensions examined in the present study. Student engagement, for example, is strengthened when learners actively participate in meaningful educational experiences, and AI supports this process by generating interactive instructional materials, adapting learning activities according to individual progress, providing immediate feedback, and presenting authentic learning scenarios that sustain student motivation and participation (Marougkas et al., 2023). Similarly, learning comprehension and retention improve when learners actively construct understanding through adaptive explanations, personalized practice, differentiated instructional support, and continuous feedback. AI contributes to these processes by analyzing learner performance, identifying misconceptions, and modifying instructional content according to students' individual cognitive needs, thereby reinforcing the constructivist principle that meaningful learning develops when instruction responds to learners' developmental readiness rather than following uniform teaching approaches (Muhajirah, 2020).

Constructivist Learning Theory also provides a meaningful lens for understanding classroom management and instructional workload within AI supported learning environments.

While the theory emphasizes teachers as facilitators rather than transmitters of knowledge, AI enables educators to devote greater attention to facilitation by automating repetitive administrative responsibilities such as lesson preparation, grading objective assessments, organizing instructional resources, and monitoring student progress. Consequently, teachers gain additional opportunities to facilitate classroom discussions, encourage collaboration, provide individualized guidance, and cultivate higher order thinking skills. Rather than diminishing the teacher's instructional role, AI enhances instructional effectiveness by reducing routine workload and allowing educators to concentrate on meaningful instructional interactions that support learner centered education.

The study further investigates teachers' perceptions regarding the effects of AI aided teaching strategies through several interconnected dimensions that collectively reflect AI integration in instructional practice. Personalization and adaptive learning operationalize constructivist principles by continuously adjusting instructional content according to learners' strengths, weaknesses, developmental readiness, and academic progress, thereby enabling differentiated learning pathways that respond to individual differences (Marougkas et al., 2023). Automation and instructional efficiency strengthen teachers' capacity to facilitate inquiry, reflection, individualized feedback, and active participation by streamlining routine instructional tasks. AI supported content creation likewise expands teachers' instructional creativity through applications such as ChatGPT, Google Gemini, Microsoft Copilot, MagicSchool AI, and Canva AI, which assist in developing differentiated lesson plans, authentic assessments, multimedia resources, and engaging instructional materials without replacing teachers' professional expertise. Furthermore, AI functions as a learning tool by providing individualized explanations, adaptive feedback, guided practice, problem solving assistance, and continuous learning opportunities that extend learning beyond the classroom while supporting independent inquiry and reflective knowledge construction. Equally important, ethical AI use reinforces constructivist principles by encouraging critical evaluation of AI generated information, responsible digital citizenship, data privacy protection, academic integrity, and informed decision making. Teachers therefore remain essential in guiding students to use AI responsibly while ensuring that technology serves as a complementary educational resource rather than a substitute for human judgment.

The integration of Constructivist Learning Theory with the Technology Acceptance Model and Diffusion of Innovations Theory provides a comprehensive conceptual foundation for understanding teachers' perspectives regarding AI driven adaptive educational strategies. Together, these theories explain how educators develop perceptions about AI technologies, how these perceptions influence instructional decision making and technology adoption, and how AI supported instruction contributes to student engagement, comprehension, retention, personalization, instructional efficiency, content creation, ethical technology use, and ultimately improved learning outcomes. The theoretical framework further illustrates this relationship by positioning Constructivist Learning Theory as the central foundation from which five essential constructs emerge: active learning, scaffolding through the Zone of Proximal Development, learner autonomy, continuous formative assessment, and social interaction and collaboration. AI technologies support each construct by promoting interactive learning experiences, adapting instructional difficulty based on learner progress, enabling individualized learning pathways, generating continuous assessment data with immediate feedback, and facilitating collaborative learning experiences enriched through intelligent support systems. Collectively, these interconnected constructs culminate in AI driven personalized learning strategies that integrate constructivist principles with emerging technologies to create dynamic, learner centered educational environments.

The theoretical framework is particularly relevant within the context of a public school district in southern Arizona, United States of America, during School Year 2025 to 2026, where

AI supported instructional practices have become increasingly integrated into classroom instruction through adaptive learning technologies, digital instructional resources, and AI assisted teaching strategies. Conducting the investigation in an educational environment where AI implementation is already actively practiced enables teachers to provide informed perspectives grounded in authentic classroom experiences rather than hypothetical assumptions. Although the study is situated outside the Philippines, its findings remain highly significant because Philippine educational institutions are likewise beginning to integrate AI into teaching, assessment, and instructional management. Consequently, the experiences, opportunities, implementation challenges, and professional development needs identified among educators in southern Arizona offer valuable insights for educators, school administrators, curriculum developers, and policymakers seeking to strengthen responsible AI integration within comparable educational contexts.

Despite substantial advances in AI technologies and an expanding body of literature examining their instructional capabilities and impact on student achievement, important gaps remain regarding teachers' perspectives on AI integration. Existing studies frequently emphasize technological innovation, system performance, or student learning outcomes while giving comparatively less attention to educators' readiness, instructional experiences, implementation challenges, and professional development needs. Since teachers continue to serve as the primary agents responsible for translating technological innovation into effective classroom practice, understanding their perspectives is essential for identifying institutional strengths, competency gaps, implementation barriers, and conditions necessary for sustainable AI adoption. Addressing this gap contributes to the growing body of knowledge concerning Artificial Intelligence in education while generating evidence based recommendations that strengthen teacher preparedness, instructional innovation, and responsible technology integration (Holmes et al., 2022; UNESCO, 2023; Luckin & Cukurova, 2019).

In response to these identified needs, the present study comprehensively examines teachers' perspectives by investigating perceptions of AI effectiveness in enhancing student engagement, improving learning comprehension and retention, supporting classroom management and workload, facilitating personalization and adaptive learning, increasing instructional efficiency, enhancing instructional content creation, functioning as a learning tool, promoting ethical AI use, and identifying implementation challenges experienced by educators. Examining these dimensions simultaneously provides a holistic understanding of both the instructional benefits and practical limitations of AI integration, thereby generating evidence that informs institutional planning and professional development.

Ultimately, the significance of the study extends beyond understanding teachers' perspectives by providing the empirical foundation for Project AI READY, or Adaptive Instruction and Research driven Educational Advancement for District Yield. This comprehensive professional development initiative is designed to strengthen teachers' competencies in integrating AI driven adaptive educational strategies through competency based training, practical workshops, prompt engineering, AI assisted lesson planning, ethical AI implementation, collaborative professional learning communities, classroom coaching, and continuous monitoring and evaluation. By directly addressing the implementation challenges and professional development needs identified through the investigation, Project AI READY seeks to improve teachers' AI literacy, strengthen instructional effectiveness, promote responsible AI use, enhance student engagement and personalized learning, and support the sustainable integration of Artificial Intelligence within contemporary educational practice. Through this integrated theoretical, conceptual, and empirical foundation, the study contributes meaningful evidence regarding how teachers' perspectives shape the effective implementation of AI driven adaptive educational strategies and their potential to enhance student outcomes within increasingly technology enriched learning environments.

Statement of the problem

This study aims to determine teachers' perspectives on the use of Artificial Intelligence (AI) driven adaptive educational strategies in personalized learning within a public school district in southern Arizona, USA, during the School Year 2025 to 2026, as the basis for the proposed Project AI READY (Adaptive Instruction and Research driven Educational Advancement for District Yield) Professional Development Program.

1. What is the profile of the respondents in terms of age and gender, years of teaching experience, subjects taught, and related training on Artificial Intelligence (AI) or educational technology?
2. Based on the teachers' perceptions, what is the level of effectiveness of AI driven adaptive educational strategies in supporting instructional practices in terms of enhancing student engagement, improving learning comprehension and retention, and supporting classroom management and workload?
3. Based on the teachers' classroom experiences, what is the extent of the effects of AI aided teaching strategies on instructional delivery and learning processes in terms of personalization and adaptive learning, automation and instructional efficiency, enhanced instructional content creation, AI as a learning tool, and fostering ethical AI use?
4. Is there a significant relationship between the perceived effectiveness of AI driven adaptive educational strategies and the observed effects of AI aided teaching strategies?
5. What challenges do teachers encounter in implementing AI driven adaptive educational strategies?
6. Based on the findings of the study, what Professional Development Program (Project AI READY) may be proposed to strengthen teachers' competencies in integrating Artificial Intelligence driven adaptive educational strategies into classroom instruction?

METHODOLOGY

This chapter presented the research methodology that was utilized to investigate teachers' perspectives on AI driven adaptive educational strategies within one of the southern public school districts in Arizona, USA. It outlined the systematic procedures and technical framework employed to gather and analyze data concerning the integration of artificial intelligence in personalized learning environments. The discussion encompassed the specific research design, the identification of the respondents, the description of the research environment, and the details of the instrument used for data collection. Furthermore, it detailed the steps taken to ensure the validity and reliability of the tools, the actual data collection procedure followed, and the statistical treatments applied to the results.

This study adopted a descriptive quantitative research design to evaluate teacher perspectives on AI driven adaptive educational strategies and their perceived impact on student outcomes within one of the public school districts in Southern Arizona, United States of America. By utilizing a structured survey methodology, this approach captured an objective, numerical snapshot of the educational landscape without manipulating variables or establishing definitive cause and effect relationships (Thomas & Zubkov, 2023). This design proved effective for identifying broad patterns and trends, allowing for a comprehensive understanding of the attitudes and behaviors of the participant group. The quantitative framework facilitated the identification of correlations between key variables, including teacher demographics,

ISSN 3028-0877 | e-ISSN 3155-6043 | DOI 10.69651/2022PIJHSS

frequency of AI trainings, and perceived improvements in student performance. By collecting large scale data from a diverse sample, the study produced results that were statistically robust and generalizable to the target population of educators. This methodology ensured that the final findings provided a data driven foundation for analyzing how AI integration influenced classroom strategies and student achievements.

This study utilized the Input Process Output (IPO) model as a structural framework to examine the interaction between teacher perspectives and the implementation of AI driven adaptive educational strategies. This model facilitated a clear flow of information, tracing the sequence of events from the introduction of AI technologies in the classroom to the emergence of measurable student outcomes. By applying this framework, the study systematically explored how various foundational factors interconnected to influence the personalized learning process. The input phase encompassed the demographic profiles and professional backgrounds of the participating teachers, including variables such as age, gender, years of teaching experience, and prior familiarity with AI technology. These inputs were gathered through a structured survey designed to assess teachers' attitudes, skills, and levels of exposure to AI tools. This baseline data provided the necessary context to analyze how individual teacher characteristics influenced their engagement with AI and their perceptions of its effectiveness in the classroom. The process phase involved the execution of descriptive quantitative data gathering procedures. A structured questionnaire was administered to a sample of educators to collect empirical data regarding their specific views on AI driven adaptive strategies. Through this systematic collection, the study moved from raw input data toward the output, which focused on the quantified impact of these strategies on student performance and the overall effectiveness of AI integration as perceived by the practitioners. The output of the study is a professional developmental program to enhance teachers' perspectives on AI driven adaptive learning strategies and the resulting student outcomes. This included a systematic assessment of how teachers' attitudes and understanding of AI influenced their classroom implementation and the perceived effects on student learning. The final stage of the IPO model incorporated a feedback loop where conclusions drawn from the interpreted data provided specific recommendations for future educational practices, policy development, and AI tool integration in schools. Ultimately, these findings offered crucial insights for educators and administrators while serving to guide the development of AI technologies tailored to maximize impact across diverse educational settings.

The study was conducted among general education teachers employed in a public school district in southern Arizona, United States of America, during the School Year 2025 to 2026. Southern Arizona was selected because the participating school district has demonstrated increasing utilization of Artificial Intelligence supported instructional technologies, adaptive learning platforms, and digital educational resources within classroom instruction. The district has likewise implemented various technology integration initiatives and professional development activities that encourage teachers to incorporate AI assisted instructional strategies into lesson planning, classroom assessment, personalized learning, and instructional management. These conditions provided an appropriate educational environment for examining teachers' perspectives regarding the effectiveness and implementation of AI driven adaptive educational strategies. The selection of southern Arizona was also influenced by the accessibility of qualified participants who possessed actual experience in utilizing AI supported instructional practices. Since the primary objective of the study was to investigate teachers' perceptions based on authentic classroom implementation rather than theoretical understanding, conducting the investigation in an educational setting where AI integration was already being practiced increased the relevance and credibility of the collected data. The respondents were therefore capable of providing informed evaluations regarding the benefits, challenges, and practical applications of AI driven adaptive educational strategies. Although the dissertation was defended in the Philippines, the researcher intentionally selected an educational setting in the United States because AI integration within American schools has progressed more rapidly compared with many developing educational systems. Examining teachers' experiences from a technologically advanced educational environment provided valuable insights into best practices, implementation challenges, and professional development needs that may serve as useful references for educational institutions seeking to strengthen AI integration. The study therefore contributes not only to understanding AI implementation within the selected Arizona school district but also to providing evidence based recommendations that may inform educational innovation in similar educational contexts. Nevertheless, the researcher acknowledges several contextual limitations associated with conducting the study in Arizona while presenting the dissertation within the Philippine educational context. Differences in curriculum standards, educational policies, technological infrastructure, funding mechanisms, teacher preparation programs, and institutional support systems may influence the transferability of the findings. Public schools in southern Arizona generally possess greater access to digital infrastructure, educational technologies, and AI supported learning platforms than many public schools in developing countries. Consequently, the findings should not be generalized directly to Philippine schools without considering contextual differences in educational resources, policy environments, and technological readiness. Despite these contextual differences, the findings remain highly relevant to Philippine education because many schools are likewise beginning to integrate Artificial Intelligence into teaching, learning, assessment, and instructional management. The challenges identified in the present study, including inadequate teacher training, technological limitations, ethical concerns, workload adaptation, and institutional readiness, are likewise emerging concerns within Philippine educational institutions. Therefore, the findings may serve as valuable references for policymakers, school administrators, curriculum developers, and teacher educators seeking to establish effective AI integration programs that respond to local educational needs while drawing upon international best practices.

The study was conducted with a focus on the research respondents, who consisted of 60 professional educators from one of the public school districts in southern Arizona, USA. These participants represented a diverse group of teaching professionals characterized by their varied educational backgrounds, instructional specializations, and years of classroom experience. The respondent pool was intentionally inclusive, capturing the perspectives of teachers across the K to 12 spectrum, from those providing foundational primary instruction to those leading specialized secondary courses. A total of 100 survey invitations were distributed to a selected group of potential participants across the district's school sites. From this initial outreach, 60 valid responses were successfully collected and utilized for the final analysis. These educators provided valuable insights into the potential benefits and challenges of AI integration, representing a broad perspective on the effectiveness and applicability of AI strategies in diverse educational contexts. Among the 60 valid responses, 20 respondents, or 33.33%, were Elementary Level teachers, 20 respondents, or 33.33%, were Middle School Level teachers, and 20 respondents, or 33.33%, were High School Level teachers, for a total of 60 respondents comprising 100.00% of the sample. To ensure a representative analysis of the district's diverse academic landscape, the study achieved a perfectly balanced distribution across different grade levels. The respondent pool was equally divided among Elementary, Middle, and High School levels, with each group contributing 20 participants, or exactly 33.33% of the total sample. This stratified approach ensured that the findings incorporated a comprehensive range of professional perspectives, reflecting the unique curricular demands and student demographics present across the district.

The study employed purposive sampling, a non-probability sampling technique in which participants are deliberately selected based on predetermined characteristics that are directly relevant to the objectives of the study. Purposive sampling was deemed appropriate because the investigation specifically sought the perspectives of teachers who had actual experience, exposure, or familiarity with the implementation of Artificial Intelligence (AI) driven adaptive educational strategies in classroom instruction. Since not all teachers utilize AI technologies in their instructional practices, selecting participants who possessed firsthand knowledge of AI integration ensured that the data collected were rich, relevant, and capable of addressing the research questions. This sampling technique is widely accepted in educational research where participants are intentionally selected because they possess specialized knowledge, experiences, or competencies related to the phenomenon being investigated. The respondents consisted of 60 general education teachers employed within a public school district in southern Arizona, USA during the School Year 2025 to 2026. The sample size was considered appropriate because the study adopted a descriptive correlational research design, wherein the objective was to describe teachers' perceptions and examine the relationships among selected variables rather than estimate national population parameters. Educational research literature indicates that descriptive and correlational studies commonly utilize sample sizes ranging from 30 to 500 respondents, depending on the accessibility of the target population and the objectives of the investigation. Creswell and Creswell (2018) emphasized that descriptive studies require a sufficient number of respondents to obtain stable estimates of group characteristics, while Gay, Mills, and Airasian (2019) noted that a minimum of 30 participants is generally acceptable for quantitative descriptive analyses, provided that the sample adequately represents the population being studied. Furthermore, the sample size of 60 respondents was considered sufficient because the target population consisted only of teachers who met the predetermined inclusion criteria established by the researcher. Specifically, participants were required to be currently employed as general education teachers within the selected public school district, actively engaged in classroom instruction during the School Year 2025 to 2026, and have experience or familiarity with AI assisted instructional practices. Since the study focused on a specific educational setting rather than attempting to generalize findings to all teachers in Arizona or the United States, purposive sampling enabled the researcher to obtain information rich cases that directly contributed to achieving the objectives of the study. The use of purposive sampling is further supported by Patton (2015), who explained that information rich participants provide in depth and meaningful insights because they possess direct experience with the phenomenon being studied. Likewise, Etikan, Musa, and Alkassim (2016) emphasized that purposive sampling is appropriate when researchers intentionally select respondents who can provide relevant and reliable information that cannot be obtained from randomly selected participants lacking the necessary experience. Considering the specialized nature of AI integration in education, purposive sampling allowed the researcher to collect valid and meaningful data from teachers who were capable of evaluating AI driven adaptive educational strategies based on actual classroom practice. Although purposive sampling limits the statistical generalizability of the findings, it substantially strengthens the internal validity of the study because the selected respondents possessed the knowledge, experience, and instructional background necessary to provide informed responses. Consequently, the findings should be interpreted within the context of the participating school district and may serve as valuable evidence for educational institutions with similar characteristics seeking to integrate AI driven adaptive educational strategies into classroom instruction.

The study utilized a researcher developed survey instrument, adapted from existing literature on educational technology and artificial intelligence, to gather quantitative and qualitative data. The instrument was designed to align with the Input Process Output (IPO) framework, ensuring that every question contributed to understanding the relationship between teacher perspectives and student outcomes. To ensure the tool's reliability and validity, it underwent a pilot testing phase and professional review before being administered to the 60 respondents within the chosen southern Arizona School District. The first section of the instrument focused on the demographic and professional profiles of the educators. It collected essential data such as the participants' years of teaching experience, primary subject areas, and the extent of their prior training in AI or educational technology. This allowed for a stratified analysis of the data, ensuring that the study could identify if factors like teaching longevity or specific subject expertise influenced a teacher's openness to AI driven adaptive strategies. The core of the instrument consisted of a multi-dimensional Likert scale, which required respondents to rate the effectiveness of AI tools across three primary domains, namely Student Engagement, Comprehension and Retention, and Academic Performance. Using a five point scale ranging from 5 (Highly Effective) to 1 (Not Effective), the researcher was able to quantify the perceived impact of AI on classroom dynamics. This section allowed for the statistical identification of patterns, such as whether teachers viewed AI as more effective for increasing student motivation versus providing timely feedback for learning retention. Within this Likert scale, a rating of 1, corresponding to the range 1.00 to 1.50, was interpreted as Not Effective, described qualitatively as Very Poor, meaning not perceived as beneficial or effective. A rating of 2, corresponding to the range 1.51 to 2.50, was interpreted as Partially Effective, described qualitatively as Poor, meaning perceived as having limited benefits. A rating of 3, corresponding to the range 2.51 to 3.50, was interpreted as Moderately Effective, described qualitatively as Fair, meaning perceived as moderately beneficial. A rating of 4, corresponding to the range 3.51 to 4.49, was interpreted as Very Effective, described qualitatively as Good, meaning generally perceived as beneficial. A rating of 5, corresponding to the range 4.50 to 5.00, was interpreted as Highly Effective, described qualitatively as Excellent, meaning highly perceived as beneficial and effective. The final component of the instrument included a multiple response checklist and open ended qualitative questions. The checklist was used to identify prevalent barriers to AI integration, such as infrastructure limitations, data privacy concerns, or lack of administrative support. Meanwhile, the open ended items invited teachers to provide nuanced descriptions of how specific AI strategies, like personalized learning paths or gamified adaptive platforms, fostered metacognition in their students. By combining these structured and unstructured elements, the instrument captured a holistic view of the current state of AI in the district's classrooms.

The research instrument was subjected to a rigorous validation and reliability testing process to ensure that the data collected from the chosen Southern Arizona School District were both accurate and consistent. To establish content validity, the survey was submitted to a panel of experts in the fields of Educational Technology and Research Methodology, who evaluated each indicator for its clarity, relevance, and alignment with the study's objectives. Based on their professional feedback, the instrument was refined to better reflect the specific pedagogical context of K to 12 educators. Furthermore, face validity was confirmed through a preliminary review by a group of teaching professionals to ensure that the questionnaire was understandable and appropriately structured for the target respondents. To verify the reliability of the instrument, a pilot test was conducted with a small group of educators who shared similar demographic characteristics with the actual participants but were not included in the final sample. The internal consistency of the Likert scale items was measured using Cronbach's Alpha, which assessed the degree to which the indicators within each domain provided stable and consistent results. The resulting alpha coefficients surpassed the standard academic threshold of 0.70, indicating that the instrument was a reliable tool for measuring teacher perspectives. This dual layered verification ensured that the survey was statistically sound and capable of producing dependable findings for the final analysis.

The data collection process was conducted with strict adherence to ethical standards and organized logistical procedures within the southern Arizona public School District. After the research instrument was validated and proven reliable, the researcher secured the necessary approvals from the relevant authorities to conduct the study. A structured survey was then distributed to a target group of 100 educators across the district's elementary, middle, and high school levels. To facilitate ease of access and ensure a high response rate, the survey was administered electronically, allowing participants to provide their insights at their convenience while ensuring the anonymity of their responses. Throughout the collection phase, the researcher monitored the incoming data to ensure that the sample remained balanced across the different academic tiers. Out of the 100 invitations sent, 60 valid responses were successfully gathered, meeting the requirements for a stratified representation of the district's faculty. Once the collection window closed, the raw data were exported from the survey platform and cleaned to remove any incomplete or duplicate entries. These finalized data were then tabulated and prepared for statistical analysis using the designated software, ensuring that the transition from raw feedback to quantifiable results was systematic and accurate.

The study was conducted with a firm commitment to ethical research practices, ensuring the protection and dignity of all participants within the chosen southern Arizona public School District. Prior to the commencement of data collection, the researcher secured formal approval from the relevant institutional authorities and school administrators. Every respondent was provided with an informed consent form that explicitly detailed the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any stage without penalty. To maintain strict confidentiality, all collected data were anonymized, ensuring that no individual names or identifying professional details were linked to specific responses in the final report. Data security was prioritized throughout the research process, with all electronic survey responses stored in a password protected environment accessible only to the researcher. Participants were assured that their feedback would be used exclusively for academic purposes and that any shared qualitative insights would be reported in a manner that prevented the identification of specific school sites or personnel. Furthermore, the researcher ensured that the study posed no physical, psychological, or professional risk to the educators involved. By adhering to these ethical guidelines, the study maintained high standards of integrity and fostered a transparent relationship between the researcher and the professional community of the chosen southern Arizona public School District.

The data collected from the survey were systematically organized, tabulated, and subjected to several statistical treatments to address the specific objectives of the study. To establish the demographic profile of the respondents within the chosen southern Arizona public School District, Frequency and Percentage Distribution were utilized. These descriptive statistics provided a clear breakdown of the participants based on their years of experience, and prior AI training. To evaluate the teachers' perspectives on AI driven adaptive educational strategies, the Weighted Mean and Standard Deviation were calculated for each indicator. These measures allowed for an objective assessment of the perceived effectiveness of AI tools in terms of student engagement, comprehension, and classroom efficiency. The weighted means were interpreted using a five point Likert scale to determine the consensus among the 60 participating educators. The relationship between teacher perspectives and perceived student outcomes was analyzed using the Pearson Product Moment Correlation (Pearson's r). This inferential statistical tool was employed to determine the strength and direction of the association between these two key variables. Furthermore, a One Way Analysis of Variance (ANOVA) was conducted to identify any significant differences in teacher perspectives when participants were categorized according to their professional profiles, such as their number of years of teaching, subjects taught, age and AI trainings or workshops. Finally, qualitative data gathered from the open ended survey items were processed through thematic analysis. The insights, challenges, and recommendations shared by the respondents were categorized into recurring themes, which served as the empirical basis for the final research output. This comprehensive statistical approach ensured that the study's findings were robust and that the resulting intervention program was directly aligned with the specific needs identified by the district's faculty.

The study utilized a five point Likert scale to measure teachers' perceptions regarding the effectiveness of AI driven adaptive educational strategies and the level of implementation of AI assisted teaching practices. The Likert scale was selected because it is one of the most widely accepted measurement instruments for assessing attitudes, perceptions, beliefs, and opinions in educational and social science research. Responses were treated as ordinal data and summarized using weighted means and corresponding verbal interpretations to facilitate meaningful analysis of teachers' perceptions. The numerical intervals and verbal interpretations were developed using the equal interval method, wherein the highest possible score (5.00) and the lowest possible score (1.00) were used to compute equal class intervals. The interval width was determined using the following formula: Class Interval equals (Highest Scale minus Lowest Scale) divided by Number of Categories. Class Interval equals (5 minus 1) divided by 5 equals 0.80. Accordingly, each response category covered an equal interval of 0.80, thereby ensuring that the verbal interpretations accurately reflected the numerical ratings while maintaining consistency in statistical interpretation. The use of equal intervals is a commonly accepted practice in educational research because it minimizes interpretation bias and allows for consistent categorization of weighted mean scores. The respondents were instructed to select the response that best represented the extent to which each statement described their actual classroom experiences and professional judgments regarding AI driven adaptive educational strategies. They were advised to answer each statement honestly based on their personal experiences rather than their expectations or desired outcomes. There were no right or wrong answers, and all responses were treated with strict confidentiality. In the scoring guide used, a score of 5 was to be chosen if the statement was consistently evident in the respondent's classroom practice or if the respondent strongly agreed that the AI strategy was highly effective and produced significant positive outcomes, and this was verbally interpreted as Highly Effective. A score of 4 was to be chosen if the statement was generally evident in the respondent's classroom practice or if the respondent agreed that the AI strategy was effective in most situations, and this was verbally interpreted as Very Effective. A score of 3 was to be chosen if the statement was sometimes evident or if the respondent believed the AI strategy was moderately effective but still required improvement or additional support, and this was verbally interpreted as Moderately Effective. A score of 2 was to be chosen if the statement was seldom evident or if the respondent believed the AI strategy was only partially effective in achieving the intended instructional outcomes, and this was verbally interpreted as Partially Effective. A score of 1 was to be chosen if the statement was not evident in the respondent's classroom practice or if the respondent believed the AI strategy was not effective in achieving its intended purpose, and this was verbally interpreted as Not Effective. The weighted mean scores were subsequently interpreted using the following equal interval scale: a weighted mean of 4.21 to 5.00 was interpreted as Highly Effective (HE), a weighted mean of 3.41 to 4.20 was interpreted as Very Effective (VE), a weighted mean of 2.61 to 3.40 was interpreted as Moderately Effective (ME), a weighted mean of 1.81 to 2.60 was interpreted as Partially Effective (PE), and a weighted mean of 1.00 to 1.80 was interpreted as Not Effective (NE). The equal interval classification adopted in this study ensured consistency in interpreting teachers' responses while allowing the researcher to compare the level of effectiveness across the different domains of AI driven adaptive educational strategies. Moreover, the behavioral descriptions provided for each response category enabled respondents to select answers that most accurately reflected their actual experiences, thereby improving the reliability and validity of the data collected.

RESULTS AND DISCUSSION

This chapter presents, analyzes, and interprets the data gathered from sixty respondents who participated in the study examining teachers' perspectives on the use of Artificial Intelligence (AI) driven adaptive educational strategies within personalized learning in a public school district in Arizona, USA, during the 2025 to 2026 school year. The study employed a descriptive correlational research design, utilizing a structured survey questionnaire as the primary data collection instrument, supplemented by qualitative interview responses from selected teacher participants to enrich and contextualize the quantitative findings. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe the demographic profile of the respondents and their perceived level of effectiveness of AI driven adaptive strategies, while Pearson correlation analysis was employed to examine the relationships between the dimensions of AI integration and the identified educational outcome variables. The discussion that follows is grounded entirely in the data gathered from the sixty respondents and is interpreted in direct relation to the objectives of the study, namely to determine the demographic profile of the respondents, to assess the perceived level of effectiveness of AI driven adaptive strategies in teaching, to determine the level of effectiveness of AI aided teaching strategies, to examine the relationship between these two sets of variables, and to identify the challenges encountered by teachers in implementing AI driven adaptive strategies in personalized learning.

With regard to the demographic profile of the respondents, the data revealed that the majority of participants were female, comprising 63.3 percent of the sample, while male respondents accounted for 36.7 percent. Across the sample of sixty teachers, the overall average age was 41.000 years, with a standard deviation of 10.32112, reflecting a moderate spread in ages among respondents. Age is recognized as a significant demographic variable in studies examining teachers' attitudes toward educational technology, including AI driven adaptive systems (Güneyli et al., 2024; Olaseni, 2024), since older teachers may have had less exposure to digital technologies during their formative professional years, potentially resulting in lower levels of digital literacy and greater resistance to technological change (Annuš, 2024; Olaseni, 2024), whereas younger teachers, who have grown up in digitally saturated environments, may be more predisposed to embracing AI driven tools as natural extensions of their pedagogical repertoire (Xing et al., 2025; Annuš, 2024). The predominance of middle aged teachers in the sample suggests that mid-career respondents, particularly those aged 41 to 50, may demonstrate more balanced openness toward AI adoption due to accumulated professional experience, while the higher proportion of female teachers indicates that gender responsive training and support mechanisms may be essential to ensure inclusive and equitable adoption of AI driven instructional practices, especially given female teachers' potential awareness of gender biases embedded in AI systems and their implications for teaching and learning (Arantes, 2022; Galés & Gallon, 2019; Luckin et al., 2024). These findings affirm that middle aged and predominantly female teachers can significantly influence the implementation of AI driven adaptive strategies, as practical knowledge, beliefs, and attitudes, rather than gender itself, are key determinants of AI integration in teaching (Güneyli et al., 2024; Karataş et al., 2024).

In terms of years of teaching experience, the results revealed that the majority of respondents possessed substantial classroom tenure, with 46.7 percent reporting 16 to 20 years of service, followed by 25.0 percent with 6 to 10 years, 16.7 percent with 1 to 5 years, and 11.7 percent falling within the 11 to 15 year bracket. The aggregate measure of teaching experience across respondents yielded an average of 12.4167 years, accompanied by a standard deviation of 5.90114 years, indicating a moderate dispersion around a central tendency that is skewed toward more seasoned educators. This finding supports Fatih et al. (2024), who demonstrated that teachers with sixteen to twenty years of experience are well positioned to apply a balanced approach in AI driven curriculum adaptation through extending, revising, and selectively omitting content, and further reinforces the likelihood of meaningful AI integration, as experienced teachers reported using AI tools such as ChatGPT to improve lesson relevance, personalize instruction, and better address students' learning needs.

With respect to the subjects taught by the respondents, mathematics emerged as the most frequently taught subject, accounting for 33.33 percent of the sample, followed by the sciences at 31.67 percent, English or Language Arts at 26.67 percent, Technology or ICT at 18.33 percent, and Social Studies at the lowest share of 15 percent. This distribution reveals a clear hierarchy in instructional focus, with mathematics occupying the largest share and Social Studies the smallest, suggesting implications for resource allocation, professional development priorities, and curriculum planning within the respondent cohort. These results align with McBean and McBean (2025), who emphasized that AI systems rely on algorithms and models that enable machines to learn from data, recognize patterns, and make decisions autonomously without direct human intervention, thereby supporting the use of AI driven personalized teaching strategies across various subject areas based on learners' needs, performance, and learning styles, consistent as well with Ertel (2024) and Holzinger, Langs, and Denk (2019), who noted that AI aims not only to replicate human cognitive processes but to surpass them in terms of speed, efficiency, and scalability.

Regarding related training on AI or educational technology, the majority of teachers reported limited exposure, with 46.7 percent having attended only one to two trainings, 18.3 percent having attended three to four trainings, 16.7 percent having attended more than four trainings, and 18.3 percent indicating no training attended at all. These findings imply that teachers' use of AI driven adaptive educational strategies in personalized learning may remain uneven, as limited training can constrain their ability to effectively integrate and maximize AI tools in instruction, a pattern supported by Howard et al. (2021), who emphasized that AI driven adaptive learning can enhance teacher effectiveness by automating routine tasks such as grading and lesson planning, thereby allowing teachers to allocate more time to higher order instructional practices, including building meaningful student relationships and addressing learners' social and emotional needs.

The perceived level of effectiveness of AI driven adaptive strategies in enhancing students' engagement yielded an overall mean of 3.43333 with a standard deviation of 0.736387, verbally interpreted as Very Effective. Among the three indicators, the statement that AI driven strategies encourage students to explore learning at their own pace obtained the highest mean of 3.4667 with a standard deviation of 0.72408, interpreted as Very Effective, followed by the statement that AI driven tools help increase student participation in class, which obtained a mean of 3.4333 and a standard deviation of 0.76727, also interpreted as Very Effective. The statement that AI tools motivate students to become more interested in lessons obtained the lowest mean of 3.4000 with a standard deviation of 0.71781, interpreted as Moderately Effective. The relatively low standard deviation across these indicators reflects a high level of agreement among respondents regarding the effectiveness of AI in promoting

PANTAO
(International Journal of the Humanities and Social Sciences)
Volume 5, Issue 3
ISSN 3028-0877 | e-ISSN 3155-6043 | DOI 10.69651/2022PIJHSS

student engagement, and these findings are consistent with Chen et al. (2022), who reported that teachers possessing higher AI readiness and stronger technological competence experienced greater teaching satisfaction and observed increased student engagement during lesson implementation. The qualitative accounts of the teacher participants reinforced these quantitative results. Elena Calalang explained that AI tools help her quickly see which students need support and give them more personalized practice, making her teaching more focused and responsive, while Reynalin Bitos shared that AI helps her quickly adjust the level of support each student needs by instantly utilizing scaffolds, visuals, or step by step guidance instead of giving everyone the same version of a task. Josalyn Sta. Maria likewise observed that AI driven adaptive tools provide immediate feedback, keep students engaged, and support their growth. These narratives illustrate that teachers already integrate applications such as ChatGPT, Google Gemini, Microsoft Copilot, MagicSchool AI, and Canva AI into differentiated instruction, formative assessment, and classroom interaction, functioning as instructional assistants rather than replacements for teachers. Nevertheless, the moderate rating obtained for AI's ability to sustain intrinsic motivation suggests that while AI substantially enhances participation and personalized pacing, genuine student motivation continues to depend largely on teachers' instructional creativity, classroom climate, and meaningful human interaction, indicating that AI should be regarded as a complementary instructional tool rather than a complete substitute for effective teacher facilitation.

In terms of improving learning comprehension and retention, the overall mean was 3.53333 with a standard deviation of 0.76646, interpreted as Very Effective. Among the indicators, the statement that AI driven adaptive strategies allow differentiation for diverse learners obtained the highest mean of 3.6500 with a standard deviation of 0.77733, interpreted as Very Effective, followed by the statement that AI tools provide timely feedback that enhances learning retention, which obtained a mean of 3.5667 and a standard deviation of 0.83090, also interpreted as Very Effective. The statement that AI assisted strategies improve students' understanding of lessons obtained the lowest mean of 3.3833, interpreted as Moderately Effective, although it recorded the lowest standard deviation of 0.69115 among the three indicators, indicating strong agreement that AI is supportive rather than independently responsible for improving comprehension. These findings are consistent with Chen et al. (2022), who observed that teachers with stronger AI readiness were better able to personalize instruction, resulting in higher student engagement and improved learning outcomes. Reynalin Bitos explained that AI helps her quickly adjust the level of support each student needs by instantly utilizing scaffolds, visuals, or step by step guidance so each student begins at a level they can handle, while Josalyn Sta. Maria shared that AI helps her personalize instruction by adjusting activities to each student's skill level and providing immediate feedback, which keeps students engaged and supports their growth, although she always reviews AI generated content to ensure accuracy and alignment with students' individualized educational goals. These accounts, together with the frequent use of ChatGPT, Gemini, MagicSchool AI, Canva AI, and adaptive learning platforms for simplifying complex concepts and generating differentiated materials, demonstrate that AI supports comprehension by expanding teachers' capacity to address diverse learning needs rather than by replacing instructional expertise.

With regard to classroom management and workload, the overall mean was 3.8722 with a standard deviation of 0.789907, interpreted as Very Effective. The indicator stating that AI assisted tools reduce workload in preparing lessons and assessments obtained the highest mean of 4.1833 with a standard deviation of 0.72467, interpreted as Very Effective and approaching the Highly Effective category, making it the strongest indicator recorded thus far in the study. The indicator stating that AI tools improve time management in classroom instruction obtained a mean of 3.7833 with a standard deviation of 0.82527, while the indicator stating that AI driven systems help in monitoring student progress effectively obtained a mean of 3.6500 with a standard deviation of 0.81978, both interpreted as Very Effective. These findings are consistent with Chen et al. (2022) and Adams et al. (2023), who emphasized that AI can be integrated into pedagogy to provide teachers with tools for preparing lessons, assessing student responses, and providing feedback, thereby reducing administrative workload. Raymark Cariquez explained that AI has made his life a lot easier since it saves him a lot of time from preparing learning activities and assessments, allowing more classroom time to be devoted to processing mathematics skills and concepts instead of copying notes. Jacqueline Hahn described AI as a powerful copilot that reclaims valuable planning time by performing the heavy lifting involved in lesson preparation, while Elena Calalang observed that AI has made planning much easier because she can create lessons faster, adjust instructional materials for different learners, and identify potential learning difficulties before class begins. However, several respondents also emphasized concerns regarding internet connectivity, inconsistent AI generated responses, software compatibility issues, formatting errors, and the continued need for human review before classroom implementation, indicating that AI functions most effectively as a collaborative instructional partner rather than an independent replacement for teachers' professional judgment.

Concerning personalization and adaptive learning, the overall mean was 3.61666 with a standard deviation of 0.750927, interpreted as Very Effective. Both the indicator on tailored content, stating that AI can analyze student performance data to identify learning gaps and adjust content accordingly, and the indicator on personalized feedback, stating that AI powered tools can offer individualized feedback on student work, obtained the highest mean of 3.6500, with respective standard deviations of 0.73242 and 0.70890, both interpreted as Very Effective. The indicator on adaptive assessments, stating that AI can generate assessments that adapt to student responses, obtained a slightly lower mean of 3.5500 with the highest standard deviation of 0.81146 among the three indicators, yet remained within the Very Effective category. These findings are consistent with Chen et al. (2022) and Celik (2023), who noted that teachers with technological knowledge of AI are better able to assess AI decisions and combine technological output with pedagogical knowledge to support delivery and deep learning. Reynalin Bitos, Josalyn Sta. Maria, and Elena Calalang each described how AI enables them to adjust support levels, utilize scaffolds and visuals, personalize activities according to skill level, and identify students needing support without relying on guesswork, illustrating the practical application of platforms such as ChatGPT, Gemini, MagicSchool AI, Khanmigo, and Canva AI in facilitating differentiated instruction, individualized feedback, and adaptive assessment across classroom practice.

For automation and efficiency, the overall mean was 3.88 with a standard deviation of 0.798, interpreted as Very Effective. The indicator on administrative task reduction obtained a mean of 3.88 with a standard deviation of 0.804, while the indicator on automated grading obtained a mean of 3.8667 with a standard deviation of 0.79119, both interpreted as Very Effective. These findings support Chen et al. (2022) and Mitra and Dangwal (2022), who observed that AI encompasses personalized learning systems, automated grading, virtual tutors, and data analytics that streamline both teaching and administrative processes. Raymark Cariquez, Jacqueline Hahn, Elena Calalang, and Cherry Avila each attested that AI has improved their efficiency in lesson planning, differentiation, and the creation of engaging learning activities, with Cherry Avila specifically stating that AI has improved her efficiency in lesson planning, differentiation, and creating engaging learning activities. Nevertheless, several participants acknowledged challenges involving inaccurate AI generated outputs, connectivity problems, and the continuing necessity of reviewing AI generated materials before classroom implementation, underscoring that automation should not be interpreted as eliminating teachers' professional responsibilities.

In terms of enhanced content creation, the overall mean was 4.08333 with a standard deviation of 0.678387, interpreted as Very Effective, representing the lowest variability recorded among the effectiveness domains examined in the study. The indicator on lesson plan generation, stating that AI can assist in generating lesson plan ideas, creating outlines, and suggesting resources, obtained the highest mean of 4.3333 with a standard deviation of 0.70511, interpreted as Highly Effective, marking the first indicator in the study to reach this category. The indicator on interactive content obtained a mean of 4.0167 with a standard deviation of 0.62414, interpreted as Very Effective, while the indicator on differentiated materials obtained the lowest mean of 3.9000 with a standard deviation of 0.70591, also interpreted as Very Effective. These findings are consistent with Chen et al. (2022), who observed that teachers with stronger AI readiness were able to integrate AI generated instructional resources more effectively into classroom practice. Jacqueline Hahn explained that AI rapidly handles the initial drafting of lesson plans, structured activities, and multi-tiered differentiated materials, describing AI as a powerful copilot that transforms her role from content creator to classroom facilitator, while Raymark Cariquez, Cherry Avila, and Marissa Yap similarly described AI as a helpful tool for lesson planning, differentiation, assessments, and generating student centered strategies that foster active learning.

Regarding AI as a learning tool, the overall mean was 3.62776 with a standard deviation of 0.696643, verbally interpreted as Very Effective. The indicator on personal tutor and the indicator on research and information gathering both obtained the highest mean of 3.6333, with respective standard deviations of 0.73569 and 0.68807, while the indicator on writing and editing support obtained a mean of 3.6167 with the lowest standard deviation of 0.66617 among the three indicators. These findings support Chen et al. (2022), who reported that teachers with stronger AI readiness observed greater learner engagement because AI enabled students to receive immediate assistance and personalized instructional support beyond regular classroom instruction. Cherry Avila explained that AI supports personalized learning by helping meet students at their individual learning levels and providing targeted support when needed, while Josalyn Sta. Maria stated that AI provides immediate feedback and helps students build confidence and make progress at their own pace, emphasizing that teachers should always review AI generated content to ensure its accuracy and appropriateness. Raymark Cariquez likewise observed that AI empowers student independent learning, although he cautioned that some learners become overly dependent on AI generated answers instead of mastering the lesson themselves, reinforcing the need for teacher supervision and responsible student use.

With regard to fostering ethical AI use, the overall mean was 3.58 with a standard deviation of 0.805, verbally interpreted as Very Effective, although this domain recorded the lowest overall mean among the five dimensions examined under teachers' perceptions of AI aided teaching strategies. The indicator on prompt engineering obtained the highest mean of 3.62 with a standard deviation of 0.715, interpreted as Very Effective, followed by the indicator on transparency and reflection, which obtained a mean of 3.6000 with the highest standard deviation of 0.86749 among the three indicators. The indicator on critical evaluation obtained the lowest mean of 3.5333 with a standard deviation of 0.83294. These findings are consistent with the ethical framework articulated by UNESCO (n.d.), which emphasizes fairness, transparency, accountability, security, and respect for human rights and privacy in the deployment of AI systems, requiring the mitigation of algorithmic bias, the assurance of human oversight, and the protection of data privacy to prevent harm and societal inequities. Annamae Jorda emphasized that she supports AI integration but with accountability and responsible use, explaining that she discourages AI use if there are no more inputs from the teacher and everything relies on the use of AI, while Josalyn Sta. Maria stressed that AI is most effective when combined with teacher expertise and that teachers should review and verify AI generated content to ensure it is accurate, appropriate, and aligned with reliable sources. Cherry Avila and Jacqueline Hahn similarly identified the need for professional development focusing on ethical AI use, data privacy, evaluating AI generated content, and protecting student privacy, indicating that the long term success of AI integration depends upon cultivating ethical awareness, critical thinking, and informed professional judgment among both teachers and students.

The relationship between the perception on level of effectiveness and the level of effect upon using AI aided teaching strategies was examined using Pearson correlation coefficients across five AI integration dimensions, namely Personalization and Adaptive Learning, Automation and Efficiency, Enhanced Content Creation, AI as a Learning Tool, and Fostering Ethical AI Use, in relation to three outcome variables, namely Student Engagement, Comprehension and Retention, and Teacher Support. The dimension of Personalization and Adaptive Learning demonstrated statistically significant positive correlations with all three outcome variables, with Student Engagement yielding a Pearson correlation of .365 and a significance value of .004, Comprehension and Retention yielding a Pearson correlation of .270 and a significance value of .037, and Teacher Support yielding a Pearson correlation of .378 and a significance value of .003, all significant at the 0.05 level or better, indicating rejection of the null hypothesis of no significant relationship for these pairs. These findings are consistent with Das and Das (2023), who noted that AI driven personalization tailors educational content to each student's needs, thereby improving both engagement and comprehension, and with Mehboob (2023) and Abgaryan et al. (2023), who found that adaptive learning systems that modify content dynamically based on individual progress maximize engagement and comprehension while also supporting educators in designing more effective instructional strategies, particularly in large classrooms where personalized attention is difficult to sustain without technological assistance (Young, 2024; Lim et al., 2023).

The Automation and Efficiency dimension likewise exhibited statistically significant positive correlations with all three outcome variables, with Student Engagement yielding a Pearson correlation of .320 and a significance value of .013, Comprehension and Retention yielding a Pearson correlation of .374 and a significance value of .003, and Teacher Support yielding a Pearson correlation of .457 and a significance value of .000, representing the strongest correlation with Teacher Support among all five AI dimensions examined. The null hypothesis of no significant relationship is rejected for all three pairs within this dimension. These results are supported by Das and Das (2023), who explained that AI tools automating administrative tasks such as grading allow educators to focus on innovative teaching methods and student mentoring, and by Abgaryan et al. (2023) and Mehboob (2023), who observed that the automation of administrative tasks reduces teacher workload and enables better time and effort management, a contribution that is well documented in the literature showing that AI powered tools reduce the time and resources required to develop materials and manage assessments (Young, 2024).

The Enhanced Content Creation dimension presented a mixed pattern of correlations, with statistically significant positive correlations recorded for Student Engagement, yielding a Pearson correlation of .355 and a significance value of .005, and for Teacher Support, yielding a Pearson correlation of .575 and a significance value of .000, the highest correlation coefficient in the entire table, thereby rejecting the null hypothesis for these two pairs. However, the correlation with Comprehension and Retention was non-significant, yielding a Pearson correlation of .220 and a significance value of .091, resulting in the failure to reject the null hypothesis of no significant relationship for this particular pair. This non-significant finding suggests that the mere creation of AI generated content does not automatically translate into deeper learning or improved retention, a nuance consistent with Patil et al. (2025), who cautioned that AI should complement rather than replace pedagogically sound instructional design, implying that the quality and pedagogical alignment of AI generated content, rather than its mere existence, may be the critical factor determining its impact on comprehension. The strong correlation with Teacher Support is supported by Young (2024), who noted that Natural Language Processing algorithms can generate content, quizzes, and assessments, and by Das and Das (2023) and Patil et al. (2025), who observed that AI powered teaching tools can create and curate real time adaptive content based on student feedback, unlocking new possibilities for instructional design, assessment, and feedback.

The AI as a Learning Tool dimension showed statistically significant positive correlations with Student Engagement, yielding a Pearson correlation of .346 and a significance value of .007, and with Teacher Support, yielding a Pearson correlation of .351 and a significance value of .006, both leading to rejection of the null hypothesis, while the correlation with Comprehension and Retention was non-significant, yielding a Pearson correlation of .248 and a significance value of .056, approaching but not reaching the conventional significance threshold, resulting in failure to reject the null hypothesis for this pair. These findings are consistent with Das and Das (2023) and Bal et al. (2024), who reported that AI powered virtual assistants provide students with instant answers, homework advice, and even emotional support, fostering a more learner centered and personalized learning experience, while Kamalov et al. (2021) cautioned that the impact of AI tools on comprehension and retention may depend on how they are integrated into the curriculum and the extent to which they promote active rather than passive engagement, with the risk of over reliance on AI generated information posing a concern for deeper cognitive processing (Patil et al., 2025).

The Fostering Ethical AI Use dimension presented the weakest and most selective pattern of correlations in the table, with non-significant correlations recorded for Student Engagement, yielding a Pearson correlation of .163 and a significance value of .213, and for Comprehension and Retention, yielding a Pearson correlation of .204 and a significance value of .119, resulting in the failure to reject the null hypothesis for both pairs, while a significant but modest positive correlation was recorded for Teacher Support, yielding a Pearson correlation of .307 and a significance value of .017, leading to rejection of the null hypothesis for this pair. This pattern suggests that fostering ethical AI use is a more abstract and systemic concern that operates at a different level from day to day learning experiences, though its significant relationship with Teacher Support aligns with Young (2024) and Mehboob (2023), who emphasized that ethical AI use involves transparency, accountability, and safeguarding student privacy, concerns that are particularly salient for educators who bear responsibility for the learning environment and must navigate algorithmic bias and data privacy issues in their professional practice, as well as ethical debates surrounding the use of AI in assessment and grading (Lim et al., 2023; Patil et al., 2025).

Across all five AI dimensions, Teacher Support consistently showed the highest correlation coefficients, with all five correlations reaching statistical significance, ranging from .307 to .575, suggesting that AI integration in education is most strongly associated with supporting teachers' professional practice rather than directly impacting student level outcomes. Student Engagement showed significant positive correlations with four of the five AI dimensions, all except Fostering Ethical AI Use, with correlation coefficients ranging from .320 to .365, while Comprehension and Retention showed the most selective pattern, with only two of the five dimensions, namely Personalization and Adaptive Learning and Automation and Efficiency, reaching statistical significance. All statistically significant correlations in the table were positive and fell within the weak to moderate range, from .270 to .575, indicating that while AI integration dimensions are meaningfully associated with educational outcomes, they are not the sole determinants of these outcomes, consistent with Kamalov et al. (2021) and Patil et al. (2025), who recognized that AI should complement rather than replace traditional teaching practices.

With respect to the challenges encountered by teachers in implementing AI driven adaptive strategies in personalized learning, lack of training or knowledge in AI integration ranked first, reported by 55 out of 60 respondents, equivalent to 91.67 percent, making it the most significant barrier identified in the study. This finding indicates that despite generally positive perceptions regarding AI's instructional effectiveness, many educators remain inadequately prepared to integrate AI confidently into their practices, a conclusion consistent with Ng et al. (2025) and prior literature emphasizing that comprehensive AI related professional development strengthens teacher confidence and technological competence. Teacher A expressed a preference for comprehensive training addressing the complexity of AI, particularly for teachers experiencing technical anxieties, while Teacher B emphasized the need for practical, hands on training that demonstrates how AI fits into everyday teaching rather than theoretical discussion alone. Teacher C similarly stressed that teachers need hands on training showing exactly how to construct effective prompts to generate lesson plans and leveled activities quickly, along with guidance on verifying AI generated information and protecting student privacy.

Additional workload in adapting to AI systems ranked second, reported by 39 out of 60 respondents, equivalent to 65.00 percent. This finding indicates that AI adoption often requires teachers to invest considerable additional time in learning new technologies, refining prompts, and verifying AI generated outputs before these efficiency benefits are fully realized, a pattern consistent with research on digital transformation in education showing an initial increase in workload before efficiency gains become evident. Teacher C described AI hallucinations, where the tool confidently invents incorrect scientific data, as among the biggest technical challenges, requiring additional time for correction, while Teacher E explained that she always reviews and adjusts AI generated content to ensure it is accurate, appropriate, and aligned with her students' individualized education program goals and instructional needs.

Limited access to technology or digital infrastructure ranked third, reported by 38 out of 60 respondents, equivalent to 63.33 percent. Teacher D explained that issues with internet connection and device compatibility sometimes force reliance on traditional PowerPoint presentations instead of more interactive AI assisted instructional strategies, while Teacher B shared that when the internet drops or devices are limited, it becomes difficult to rely on AI tools, occasionally requiring a return to traditional teaching methods. These accounts are consistent with prior research identifying insufficient internet connectivity, limited access to digital devices, and inadequate technological infrastructure as significant hindrances to the effective implementation of AI powered instructional systems.

Resistance from students in using AI tools ranked fourth, reported by 36 out of 60 respondents, equivalent to 60.00 percent. Teacher D observed that while AI is a strong support tool that empowers student independent learning, some students abuse the tool by heavily relying on it for answers without learning the materials, while Teacher A expressed support for AI integration but with accountability and responsible use, discouraging its use when there are no further inputs from the teacher and everything relies on AI. These findings are consistent with technology acceptance literature indicating that learners are more likely to embrace new instructional technologies when they perceive them as useful, easy to use, and directly beneficial to academic performance.

Concerns about data privacy and security ranked fifth, reported by 30 out of 60 respondents, equivalent to 50.00 percent. Teacher G emphasized that teachers require

ISSN 3028-0877 | e-ISSN 3155-6043 | DOI 10.69651/2022PIJHSS

professional development focusing on practical classroom applications, ethical AI use, data privacy, and evaluating AI generated content, while Teacher C explained that effective AI training should teach educators how to double check AI for scientific accuracy, protect student privacy, and identify biased information. These findings align with prior research identifying concerns regarding unauthorized access, data misuse, algorithmic transparency, and cybersecurity as influential factors in teachers' willingness to integrate AI into classroom instruction.

Lack of administrative or institutional support ranked sixth and lowest among the identified challenges, reported by 16 out of 60 respondents, equivalent to 26.67 percent. Although the lowest ranked challenge, its influence extends across all other implementation barriers identified in the study, as administrative leadership is responsible for establishing institutional policies, allocating resources, and maintaining technological infrastructure. Teacher A explained that if AI use is required for teachers, institutions should provide all necessary resources, otherwise it becomes burdensome, while Teacher C stressed that schools should allocate regular time for teachers to collaborate and share their best AI shortcuts.

Taken together, the findings of this chapter demonstrate that the sixty teacher respondents, predominantly female, averaging 41.000 years of age, and possessing an average of 12.4167 years of teaching experience, generally perceive AI driven adaptive educational strategies as Very Effective across multiple instructional domains, ranging from enhancing student engagement, with an overall mean of 3.43333, to improving learning comprehension and retention, with an overall mean of 3.53333, supporting classroom management and reducing workload, with an overall mean of 3.8722, promoting personalization and adaptive learning, with an overall mean of 3.61666, enabling automation and efficiency, with an overall mean of 3.88, enhancing content creation, with an overall mean of 4.08333, functioning as a learning tool, with an overall mean of 3.62776, and fostering ethical AI use, with an overall mean of 3.58. The Pearson correlation analysis further revealed that Teacher Support consistently exhibited the strongest and most statistically significant associations across all five AI dimensions, while Student Engagement and, to a more limited extent, Comprehension and Retention were also positively and significantly associated with several dimensions, most notably Personalization and Adaptive Learning and Automation and Efficiency. At the same time, the identification of lack of training or knowledge in AI integration as the foremost challenge, affecting 91.67 percent of respondents, alongside additional workload, limited technological infrastructure, student resistance, data privacy concerns, and administrative support gaps, underscores that the successful and sustainable integration of AI driven adaptive strategies into personalized learning depends not solely on the perceived effectiveness of the technology itself but equally on systemic investments in teacher training, infrastructure, ethical governance, and institutional leadership. These findings collectively address the objectives of the study by establishing both the promise and the practical constraints of AI integration within the selected public school district in southern Arizona, and they provide the empirical foundation for the recommendations and proposed AI Ready Professional Development Program to be discussed in the succeeding chapter.

CONCLUSION

The study concludes that teachers in the public-school district in southern Arizona generally hold positive perspectives on the use of Artificial Intelligence driven adaptive educational strategies in personalized learning, perceiving them as very effective in enhancing student engagement, improving comprehension and retention, and supporting teacher related tasks such as classroom management and workload. This favorable outlook is further reinforced by the demographic profile of the respondents, most of whom were between 41 and 50 years old, predominantly female, possessed sixteen to twenty years of teaching experience in public schools, and were largely engaged in teaching Mathematics. Despite having attended only one to two related trainings on AI or educational technology, these teachers demonstrated a strong appreciation for the potential of AI aided strategies, suggesting that positive perceptions can develop even in the absence of extensive formal preparation, though such limited exposure simultaneously points to an underlying gap that warrants attention.

Moreover, the significant relationships identified between AI aided strategies and key learning outcomes, particularly in the areas of personalization, automation, and content creation, affirm the potential of AI to strengthen instructional practices and validate the perceived effectiveness reported by the respondents. The comparatively weaker and more limited relationship observed in relation to fostering ethical AI use, however, indicates that while teachers recognize the instructional benefits of AI, their capacity to consistently model and reinforce ethical considerations in its application remains an area requiring further development. This distinction between strong instructional gains and modest ethical grounding underscores that effectiveness alone is insufficient without a parallel emphasis on responsible use.

Nevertheless, the study also reveals those existing challenges, most notably the lack of training and knowledge in AI integration, continue to hinder teachers from maximizing the benefits of these strategies. This finding highlights the need for a structured and targeted professional development program to ensure effective and ethical implementation, and it directly informed the formulation of Project AI READY, the proposed Adaptive Instruction and Research driven Educational Advancement for District Yield. In light of these conclusions, it is recommended that teachers continuously enhance their competencies in integrating AI driven adaptive strategies through active participation in workshops, seminars, webinars, and certification courses, while familiarizing themselves with applications such as ChatGPT, Google Gemini, Microsoft Copilot, MagicSchool AI, Canva AI, and Khanmigo, and strengthening their skills in prompt engineering, AI assisted lesson planning, differentiated instruction, and critical evaluation of AI generated content, always ensuring that such tools supplement rather than replace sound pedagogical practice and meaningful teacher-student interaction.

Correspondingly, school administrators and educational leaders are encouraged to institutionalize sustained training, coaching, and technical assistance, allocate adequate resources for infrastructure and connectivity, and establish clear policies on data privacy, cybersecurity, and ethical technology integration, alongside the formation of professional learning communities and AI innovation teams that support collaborative and continuous improvement. Policy makers and educational authorities, in turn, should formulate comprehensive frameworks and standardized AI competency guidelines, integrate AI literacy into teacher education programs, and ensure equitable funding to minimize disparities in access to AI technologies across schools. Technology developers and educational technology providers are likewise urged to collaborate closely with educators to design AI applications that are user friendly, curriculum aligned, and equipped with robust data privacy protections, while continuously reducing inaccuracies and algorithmic bias to support sound instructional decision making. Higher education institutions and teacher education programs should similarly integrate AI, digital pedagogy, and AI ethics into pre-service curricula to adequately prepare future educators for the demands of technology enhanced classrooms.

Taken together, these conclusions and recommendations underscore that the effective and ethical integration of AI driven adaptive educational strategies is a shared responsibility that extends beyond individual teachers to encompass administrators, policymakers,

ISSN 3028-0877 | e-ISSN 3155-6043 | DOI 10.69651/2022PIJHSS

technology developers, and teacher education institutions alike. Future researchers are therefore encouraged to expand this line of inquiry through larger and more diverse populations, longitudinal and experimental designs, and investigations into variables such as digital literacy, AI self-efficacy, and organizational readiness, as well as to evaluate the eventual implementation of Project AI READY in order to determine its long-term impact on teachers' professional competencies, classroom practices, and student learning outcomes.

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