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Future-Proofing Foundational Reading Instruction: Unveiling Teachers' Experiences and Perspectives on AI Integration

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Abstract:
The integration of Artificial Intelligence (AI) into education is reshaping pedagogical practices and compelling teachers to adapt instruction to emerging technological demands. This study, Future-Proofing Foundational Reading Instruction: Unveiling Teachers' Experiences and Perspectives on AI Integration, explored how AI supports early literacy and influences teachers' perceptions, experiences, and classroom practices. Using a grounded theory design, nine purposively selected School Reading Coordinators and Key Stage 1 teachers from public elementary schools in Sorsogon City participated in structured focus group discussions. Data were thematically analyzed and triangulated to ensure credibility and trustworthiness.

Findings revealed a shift in teachers' orientations toward AI, from initial apprehension to informed appreciation of its pedagogical value. Teachers recognized AI's potential to enhance personalization, learner engagement, contextualized material development, differentiated instruction, and assessment efficiency. Despite these benefits, participants emphasized the need for rigorous verification to ensure accuracy, curricular alignment, and developmental appropriateness of AI-generated content, affirming that AI augments rather than replaces teacher expertise. Challenges included inadequate infrastructure, limited institutional support, insufficient localized training, unclear policy directions, and concerns about data privacy and ethics.

The study concludes that AI can undoubtedly strengthen foundational reading instruction when situated within robust professional, pedagogical, and ethical frameworks. To guide responsible integration, the C.A.R.E. Professional Development Framework, Contextualized Adoption, Adaptive Pedagogical Design, Reflective Practice and Growth, and Ethical and Relational Engagement, was proposed. Future-proofing early literacy requires sustained capacity-building, supportive systems, and equitable digital access to empower teachers and cultivate adaptive, proficient readers.

Keywords: Artificial Intelligence, foundational reading, literacy instruction, teacher experiences, professional development, C.A.R.E. Framework

I. INTRODUCTION

The advent of advanced technology has significantly transformed human routines, rendering daily life less conventional while enhancing the immediacy and efficiency of work-related tasks. This is particularly evident in the field of educational development, where technology has profoundly influenced how

educators and learners conceptualize knowledge, access information, and articulate their ideas. One significant technological evolution is artificial intelligence (AI), a pivotal technological advancement that has reshaped the trajectory of human progress. Beyond enhancing the efficiency of task execution, it offers immediate access to information with unprecedented ease and speed.

The International Business Machines Corporation (IBM) defines AI as "a technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity, and autonomy." It feigns and processes information, including learning, reasoning, and even self-correction, similar to our human brains in an instant. Moreover, AI can gather information, compare, and produce an almost perfect idea from a simple command input through a computer system. Also, the National Aeronautics and Space Administration (NASA) refers to "Artificial intelligence in computer systems that can perform complex tasks normally done by human reasoning, decision making, creating, etc." For NASA, AI is a computer system that can promptly perform tasks that humans cannot accomplish in a matter of time, especially in data collecting and collating, and decision-making. There is no simple and single definition of AI. Its definition varies depending on the range of tasks and output that the artificial intelligence provides. Hence, artificial intelligence also varies in its types depending on the purpose and utilization.

In the field of education, artificial intelligence is making a buzz as an innovative tool or application to aid learning. Its purpose also varies in the field of education, subject to the limitations of the skill, facility, and research and development. In 2020, the World Economic Forum identified eight pivotal transformations needed to enhance education quality in the age of the Fourth Industrial Revolution – Education 4.0 Framework. As AI emerges as the defining technology of this era, we can accelerate the adoption of Education 4.0 by using this technology and ensuring learners are equipped to thrive with it. It emphasizes four (4) key promises that have emerged for AI to enable Education 4.0 on its report - Shaping the Future of Learning: The Role of AI in Education 4.0, namely: i. Supporting teachers' roles through augmentation and automation; ii. Refining assessment and analytics in education; iii. Supporting AI and digital literacy; and iv. Personalizing learning content and experience. Similarly, AI has been a center of debate across the globe in reference to its utilization in the delivery of the teaching-learning process. Thus, the United Nations General Assembly has adopted a landmark resolution on promoting safe and ethical standards on the use of Artificial Intelligence for the benefit of the Sustainable Development Goals. The UN General Assembly last April, 2019, drafted approaches that lay out commitments to promote system-wide action on: i. AI-related capacity-building for developing countries with a focus on the "bottom billion; ii. Supporting broader stakeholder engagement and knowledge exchange within and outside the United Nations system on AI; iii. and Promoting the ethical development and application of AI technologies for the public good. This policy has become the standard in academe to craft an inclusive, safe, and relevant use of AI in education.

Various international institutions are shifting their goals to integrate AI to harmonize existing policies and practices to shape the future of education. The International Conference on Artificial Intelligence (AI) and Education promulgated the Beijing Consensus on Artificial Intelligence and Education last May 2029. It reaffirmed the commitment made in the 2030 Agenda for Sustainable Development, particularly Sustainable Development Goal (SDG) 4 and its targets, and discussed the challenges faced by education and training systems in achieving SDG 4. This commitment leads to appropriate policy responses aimed at the systematic integration of AI and education to innovate education, teaching, and learning, and at leveraging AI to accelerate the delivery of open and flexible education systems that enable equitable,

relevant, and quality lifelong learning opportunities for all, which will contribute to achieving the SDGs and the shared future for mankind.

Moreover, teachers must be the first to adopt AI as a tool in education. UNESCO has drafted the AI competency framework for teachers, focused on lifelong professional development for teachers, offering a reference framework for national competency development and training programs. It aims to ensure that teachers are equipped to use AI responsibly and effectively while minimizing potential risks to students and society. Further, the framework emphasizes that AI tools should complement, not replace, the vital roles and responsibilities of teachers in education. Accordingly, this framework will help to bridge the generational gap between students and teachers by meeting halfway on the utilization of technological trends.

In the national setting, the Philippines has continuously been grappling to at least narrow the gap both on policies and utilization of artificial intelligence as a supplement in providing quality, relevant, and accessible education. Various international standard assessment and evaluation organizations constantly tag the country as behind in expected literacy skills based on their grade level. It must be noted that during the pandemic, the use of technological information and communication has been at the forefront, justifying the continuity of education. As a consequence, the learning gap has widened because of a lack of educational preparation to use the available technology. Thus, the digital gap has resulted in a learning gap among learners, especially in the rural areas of the country. The Philippines, as a tech-savvy country, has been actively embracing AI, with a focus on leveraging its potential for economic growth, national development, and improving various aspects of daily life. The country is also taking steps to address the ethical and societal implications of AI through regulatory frameworks and initiatives. Asia Business Law Journal reported that the Philippines edged up the rankings, from 65th to 56th, in the latest Government AI Readiness Index 2024, which assesses the readiness of artificial intelligence (AI) in 188 countries. The index, published by Oxford Insights, is based on 40 indicators spread across 10 dimensions and three core pillars, namely, government, technology sector, as well as data and infrastructure. Consequently, the result attests that while the Philippines is adapting to AI integration, especially teachers in preparing their lessons and materials, little has been done to upskill teachers in using AI as an integrative part of teaching.

Teachers need support from the department to constantly upskill and ethically utilize AI tools. In the study of Rodrigo & Felipe (2024, among the 48 teachers interviewed, a total of 40 reported having ancillary task assignments or non-teaching responsibilities. When the teachers were asked if they used any AI applications, it was found that teachers have adopted a strategy that is found in wider contexts locally and internationally: Bring Your Own Artificial Intelligence (BYOAI). BYOAI refers to corporate employees' use of AI to complete their tasks on an individual basis and without institutional support. Following the same practice, almost half (45 percent) of the teachers we interviewed mentioned that they had explored or used ChatGPT at least once, mainly to draft lesson plans, design activities, design assessments, or generate ideas about topics that were new to them. Other popular applications they mentioned were Grammarly and Quillbot, both considered AI-based writing assistants. They used these applications to correct grammar and to help them rephrase narratives in their lesson plans and reports. Some teachers also used Canva to prepare visual aids. Thus, the use of AI by teachers is not new; however, no significant scaffolding has been provided for teachers, resulting in various AI tools and applications depending on what AI tools and applications are available to them. The researcher assumed that the absence of standard AI tools and applications for teachers might become a problem in the future, both ethically and effectively, as they may be prey to the misinformation available on the internet.

The Department of Education (DepEd) is quick in outlining programs and policies to resolve the widening digital and generational gap among teachers and students. The Department has launched the Education Center for AI Research (E-CAIR), aiming to drive innovation in Philippine education through AI-powered solutions aligned with its 5-Point Reform Agenda. "As the first-ever hub for AI research in education in the Philippines, E-CAIR will focus on revitalizing basic education by developing AI-driven tools that enhance teaching, learning, and school administration". The said program hopes for effective AI solutions for educators and students across the nation, such as refining education voucher allocation, employing computer vision to identify stunted and wasted students, improving detection and assessment of learners with disabilities, mapping natural hazards for both public and private schools, strengthening public-private partnerships via Adopt-A-School, and advancing the skills of school leaders.

Access to the internet is the main consideration in the integration of AI into the school teaching-learning process. In the news article published by The Filipino Times' article Unrestricted use of internet makes Filipino children vulnerable - studies, dated August 3, 2021, stated that, One out of two children use the Internet for schoolwork at least every week, and more girls compared to boys go for regular use of the Internet for schoolwork. Also, in 2020, UNICEF reported that children (in the Philippines) most commonly access the Internet on their smartphone, while at home, but many also frequent both libraries and Pisonet cafés to go online, which together account for the second and third most common places of access. This means that Filipino children have wide access to the internet, including access to gadgets.

Regionally, the Bicol region lags in the physical computer tools and their utilization. DepEd's Data Bits: Functional Computers and Internet Connectivity 2021 report posted a low computer ratio and accessibility for the Bicol Region. While the average ratio is 1:19, Region V has a 1:21 ratio of functional computers for the elementary level. In internet connectivity, Bicol ranked at the bottom of all regions with less than half of the percentage, or 46.4% in internet connectivity for the elementary level. The computer ratio and internet connectivity are two basic tools needed in order to integrate AI in the teaching-learning process. Without these, teachers will revert to the traditional way of teaching, far from the reality of the DepEd's 10-point agenda for the promotion of information and communications technology (ICT) -assisted learning and the learners' improved competence in ICT.

In the Province of Sorsogon, the use of artificial intelligence has focused on school operations. This is also mostly on the higher institutions' operational tasks, such as the Learning Management System. In the study of Belisano and Sarmiento (2025) they found that students and staff acknowledge the effectiveness of AI chatbots in handling school inquiries and support services, particularly appreciating their quick responses and accessibility. Concerns regarding the contextual accuracy and reliability of the information provided highlight the need for further improvements to ensure their full potential is realized in educational settings. In the teaching-learning process, there are programs that link to the use of electronic means to bolster the effectiveness of the curricula. The study of Daradar & Atutubo (2023) revealed that the e-government programs implemented under the e-participation in the teaching-learning process (TLP): Virtual Brigada Pagbasa Program, Radio-Based Instruction (RBI), DepEd TV, Educational Blog, Educational Live Stream on Social Media, Online Quiz Applications, Learning Resource Management and Development System (LRMDS), DepEd Commons, DepEd TV, and DepEd ETUlay Tutorial. The study also implies that there is a need to strengthen the utilization of these primary e-sources, platforms of learning, and supplementary materials by conducting training orientation for the stakeholders to be oriented on how to operate, manipulate and utilize the learning tools as well as to establish the monitoring and evaluation to determine strengths and weaknesses of the e-government programs under participation

in the TLP. However, none of these programs mentioned the integration of AI to optimize the utilization of the program; more so, none has dared to harmonize AI tools to improve the teaching-learning programs for the schools.

The integration of artificial intelligence into the teaching-learning process is essential in preparing students to become future-ready. AI is poised to remain a permanent fixture in daily human life, shaping the way individuals interact, work, and learn. For today's learners, this technological shift is not merely an innovation; it is becoming the new norm. At the same time, reading remains a foundational skill that enables learners to make sense of their environment. Without the ability to read, students are unable to decode the abstract concepts that underpin much of human knowledge and communication. Thus, fostering strong reading skills alongside AI integration is critical in equipping learners for the demands of a rapidly evolving world. This is why this study is essential. The demand for more tech literacy must begin now.

The rapid advancement of technology has transformed education, reshaping how teachers and learners' access, process, and apply knowledge. Among these innovations, artificial intelligence (AI) has emerged as a defining force, offering tools that can personalize learning, streamline assessment, and augment instructional practices. While AI is increasingly recognized as a catalyst for Education 4.0, its integration into foundational literacy instruction remains underexplored, particularly in developing contexts. Global organizations such as UNESCO and the World Economic Forum emphasize the potential of AI to support teachers, refine assessment, and personalize learning experiences. At the same time, they caution that AI must complement, not replace, the professional expertise of educators. Nationally, the Philippines has begun initiatives to harness AI for education, yet challenges persist: limited infrastructure, uneven access, and insufficient teacher training hinder effective adoption. These gaps are especially evident in the Bicol region, where connectivity and resources remain below national averages.

Foundational reading instruction is a critical area where AI integration could have transformative impact. Reading is the gateway to all learning, and early literacy lays the groundwork for lifelong educational success. However, despite the growing presence of AI tools in classrooms, little is known about how teachers perceive and experience their use in supporting early literacy. Existing studies highlight teachers' informal adoption of AI applications, but institutional support, ethical safeguards, and professional development remain inadequate. This study addresses that gap by exploring teachers' experiences and perspectives on AI integration in foundational reading instruction. Using a grounded theory approach, it seeks to uncover how educators navigate opportunities and challenges, filter AI-generated content, and envision professional development needs. In doing so, the study contributes to the discourse on responsible AI use in education and proposes the C.A.R.E. Framework- Contextualized Adoption, Adaptive Pedagogical Design, Reflective Practice and Growth, and Ethical and Relational Engagement, a guide for future practice. By situating teacher voices within global and national policy discourses, this research not only advances theoretical understanding of AI in literacy education but also provides actionable insights for curriculum design, professional development, and equitable digital transformation in developing contexts.

Statement of the Problem

This study aimed to unveil Teachers' Experiences and Perspectives on Artificial Intelligence Integration for a Future-Proofing Foundational Reading Instruction, particularly in the following:

1. What are the teachers' experiences and perspectives on foundational reading instruction with AI in the classroom?

2. How is AI perceived to be a teaching support for foundational reading instruction based on teachers' experiences, in terms of:
    2.1.Reading Instructional Materials Development
    2.2.Teaching-Learning Process
    2.3.Reading assessment and feedback
3. How do teachers filter the information provided by AI tools and applications in the preparation of foundational reading instructions?
4. What are the limitations and challenges that teachers experience in integrating AI tools effectively, along with:
    4.1.Reading Instructional Materials Development
    4.2.Teaching-Learning Process
    4.3.Reading assessment and feedback
5. What possible Professional Development Program can be proposed to support foundational reading teachers in effectively integrating AI into foundational reading instruction?

Research Assumptions

The following are the assumptions of this research:

1. Teachers have varying levels of experience and familiarity with integrating AI tools into foundational reading instruction.
2. AI tools are perceived by teachers to offer both benefits and limitations in supporting foundational reading instruction.
3. Teachers apply personal judgment and pedagogical knowledge when filtering and utilizing AI-generated content for reading instruction.
4. The integration of AI in foundational reading instruction presents practical and contextual challenges across different instructional components.
5. A well-designed professional development program can enhance teachers' capacity to integrate AI effectively into foundational reading instruction.

II. METHODS AND PROCEDURES

Research Design

Artificial Intelligence in Education has been recognized as a transformative force, often described as the future of teaching and learning. This study aimed to delve into the experiences and perspectives of teachers on AI integration in foundational reading instruction through a qualitative lens. A grounded theory design was employed to develop a framework based on participants' lived experiences rather than imposed from existing models. Grounded theory is particularly suited to complex and under-researched topics, as it allows themes and patterns to emerge inductively from data (Charmaz, 2014; Stough & Lee, 2021; Paapa & Kambona, 2025). This ensured that the framework was authentic, contextually relevant, and reflective of teachers' actual practices.

The Participants

The study involved nine (9) purposively selected teachers from public elementary schools in the Sorsogon City Division. Participants were chosen based on their direct involvement in foundational reading instruction and their specialized roles in implementing reading programs. The group consisted of four (4) School Reading Coordinators and five (5) Key Stage 1 teachers, all actively engaged in designing or delivering literacy instruction in the early grades. Their experiences and perspectives were deemed

essential in understanding the realities, challenges, and practices related to enhancing foundational reading in the context of emerging educational shifts (Etikan & Bala, 2017; Palinkas et al., 2015).

Instrumentality

To capture the depth and breadth of teachers' experiences with AI integration in foundational reading instruction, the study employed a combination of structured interview guides and focus group discussions (FGDs). The interview guide was carefully designed to elicit detailed accounts of teachers' practices, challenges, and strategies, while ensuring consistency across sessions. Structured questions provided a framework for discussion, but the format also allowed participants to elaborate freely, ensuring that nuanced perspectives were not lost. FGDs were chosen because they encourage interaction among participants, enabling collective reflection and the surfacing of shared experiences (Krueger & Casey, 2020). Beyond interviews, triangulation was applied as a methodological instrument to validate findings. This involved cross-verifying insights from multiple sources, participant responses, researcher observations, and relevant documents, to minimize bias and strengthen the credibility of emerging themes (Denzin, 2012; Noble & Smith, 2020). Triangulation was particularly valuable in this study, as it ensured that conclusions were not drawn from a single viewpoint but reflected a more comprehensive understanding of teachers' realities.

To further enhance rigor, the interview guide underwent pilot testing with a small group of teachers not included in the final sample. This step allowed the researcher to identify ambiguous questions and refine the instrument for clarity and relevance. Additionally, expert review was sought from specialists in literacy instruction and qualitative research, who provided feedback on the content and structure of the instruments. Such validation processes are increasingly emphasized in qualitative research to ensure that instruments are both contextually appropriate and methodologically sound (Stough & Lee, 2021). Together, these instruments provided a robust mechanism for gathering data. The structured interviews ensured coverage of all key areas, FGDs facilitated dynamic exchanges of ideas, triangulation strengthened validity, and pilot testing plus expert review enhanced reliability. This multi-layered approach ensured that the study captured a comprehensive and trustworthy account of teachers' experiences and perspectives on AI integration in foundational reading instruction.

Data Collection Procedures

The data collection process for this study emphasized both ethical safeguards and methodological thoroughness. Before initiating any contact with participants, the researcher obtained formal authorization from the Schools Division Superintendent, Education Program Specialist in English, Division Reading Coordinator, and the relevant school principals. This step underscored the study's commitment to institutional protocols and transparency, ensuring that the research was conducted with full awareness and approval of educational authorities.Once permissions were granted, the researcher conducted in-depth focus group discussions (FGDs) with the selected teachers. FGDs were scheduled at times most convenient for participants and held in private settings to maintain confidentiality and encourage open dialogue. Structured interview guides were used to ensure consistency across sessions, but the format allowed participants to elaborate freely, fostering rich and nuanced accounts of their experiences. This approach aligns with best practices in qualitative research, where FGDs are recognized as effective for capturing collective perspectives and dynamic interactions among participants (Krueger & Casey, 2020).

Each session was audio-recorded with participants' consent and later transcribed verbatim to ensure accuracy and completeness of the data. The researcher also maintained field notes and observational records to capture non-verbal cues, contextual factors, and group dynamics that enriched the interpretation

of findings. Such triangulation of data sources, combining transcripts, observations, and documents, helped strengthen credibility and reduce bias (Noble & Smith, 2020).To further enhance rigor, the researcher employed pilot testing of the interview guide with a small group of teachers not included in the final sample. This step allowed refinement of questions for clarity, relevance, and cultural appropriateness. Additionally, expert review was sought from specialists in literacy instruction and qualitative methodology, ensuring that the instruments were aligned with both educational and research standards (Stough & Lee, 2021).

Throughout the data collection process, the researcher prioritized ethical considerations. Participants were fully informed about the study's purpose, procedures, and their rights, and they provided written informed consent. Anonymity was maintained by assigning codes instead of real names, and all data were stored securely with access restricted to the research team. Participation was voluntary, with the right to withdraw at any stage. These practices reflect contemporary ethical guidance in qualitative research, emphasizing respect, beneficence, and justice (McLeod, 2024).By combining structured FGDs, careful scheduling, triangulation of sources, pilot testing, and expert validation, the data collection procedures ensured that the study gathered comprehensive, credible, and ethically sound insights into teachers' experiences and perspectives on AI integration in foundational reading instruction.

Data Analysis

The study employed thematic analysis to interpret the qualitative data gathered from focus group discussions. This analytic approach was chosen for its flexibility and capacity to uncover patterns of meaning across participants' narratives, making it particularly suitable for exploring complex and under-researched topics such as AI integration in foundational reading instruction (Braun & Clarke, 2006; Kushnir, 2025).The analysis began with familiarization, where transcripts of the FGDs were read and re-read to gain a holistic understanding of the data. During this stage, the researcher also reviewed field notes and observational records to capture non-verbal cues and contextual details that enriched interpretation.

The next phase involved initial coding, in which significant statements were highlighted and assigned codes representing the core ideas expressed. For example, teachers' accounts of their "first encounters with AI" were coded with descriptors such as exciting or impactful, while references to "frequency of AI usage" were coded as regular integration or daily use. This systematic coding process broke down large volumes of text into manageable units, laying the foundation for deeper analysis (Stough & Lee, 2021).

Following coding, the researcher engaged in categorization, grouping related codes into broader categories based on similarities. Categories such as teacher challenges, pedagogical adaptations, and ethical concerns began to emerge, reflecting recurring issues across participants' accounts. This stage helped organize the data into meaningful clusters that pointed toward overarching patterns. The process then advanced to theme development, where categories were synthesized into higher-order themes that captured the essence of teachers' experiences and perspectives. Themes such as navigating opportunities and challenges of AI, filtering and adapting AI-generated content, and professional development needs were identified. These themes provided a nuanced understanding of the dynamics at play in foundational reading instruction, moving beyond surface-level issues to uncover root causes and implications (Paapa & Kambona, 2025).

To strengthen credibility, triangulation was employed by cross-verifying insights from FGDs with observational notes and relevant documents. This strategy reduced bias and ensured that findings were not based on a single source of evidence (Denzin, 2012; Noble & Smith, 2020). Additionally, reflexivity was maintained throughout the analysis, with the researcher critically reflecting on her own assumptions and positionality to ensure interpretations remained grounded in participants' voices. The final stage involved

reporting, where themes were articulated in a coherent narrative supported by direct participant quotations. This ensured that teachers' voices were authentically represented and that findings were both credible and contextually rich. Thematic analysis, as applied in this study, thus provided a systematic yet flexible framework for uncovering insights into how teachers experience and perceive AI integration in foundational reading instruction.

Ethical Standards in Conducting Qualitative Research

The study was guided by contemporary ethical principles to ensure integrity, transparency, and participant protection. Before data collection, formal authorization was obtained from the Schools Division Superintendent, Education Program Specialist in English, Division Reading Coordinator, and school principals. This step underscored the researcher's commitment to institutional protocols and accountability, ensuring that the study was conducted with full awareness and approval of educational authorities. Such adherence to institutional clearance reflects best practices in qualitative research, where respect for organizational structures is considered foundational to ethical inquiry (McLeod, 2024).

Participants were fully informed about the study's purpose, procedures, and their rights, and they provided written informed consent prior to participation. Confidentiality was maintained by assigning codes instead of real names, and all data were stored securely with access restricted to the research team. Participation was voluntary, with the right to withdraw at any stage without penalty. These safeguards ensured that participants were not only protected but also empowered to make informed decisions about their involvement. Ethical principles of beneficence, respect, and justice were upheld throughout, aligning with recent scholarship that emphasizes participant well-being and autonomy in qualitative research (Noble & Smith, 2020).

The researcher also prioritized minimizing risks and ensuring sensitivity to participants' professional and personal contexts. Focus group discussions were conducted in private settings to encourage openness and reduce potential discomfort. Reflexivity was maintained, with the researcher critically reflecting on her positionality and potential influence on the data collection process. This reflexive stance ensured that participants' voices were authentically represented and that interpretations remained grounded in their lived experiences. By integrating these ethical safeguards, the study not only complied with established standards but also demonstrated a proactive commitment to responsible and respectful qualitative inquiry (Paapa & Kambona, 2025).

Validity and Trustworthiness

In this study, credibility was ensured through triangulation and member checking. Triangulation involved comparing and cross-verifying insights from focus group discussions, researcher observations, and relevant documents. This process minimized bias and strengthened the reliability of the findings by ensuring that conclusions were not drawn from a single source of evidence. Member checking was also conducted by presenting preliminary interpretations to participants, allowing them to confirm or clarify the accuracy of the researcher's understanding. These strategies ensured that the findings authentically represented teachers' experiences and perspectives on AI integration in foundational reading instruction.

Dependability and confirmability were achieved through transparent documentation of research procedures and reflexivity. Dependability was ensured by maintaining clear records of data collection and analysis steps, creating an audit trail that allows others to trace the methodological decisions made throughout the study. Confirmability was strengthened by reflexivity, with the researcher critically reflecting on her positionality and potential influence on interpretations. This reflexive stance ensured that conclusions were grounded in participants' actual words rather than researcher bias. Together, these

strategies demonstrate adherence to Lincoln and Guba's (1985) classic criteria while aligning with recent discussions of rigor and trustworthiness in qualitative inquiry (Noble & Smith, 2020; Paapa & Kambona, 2025).

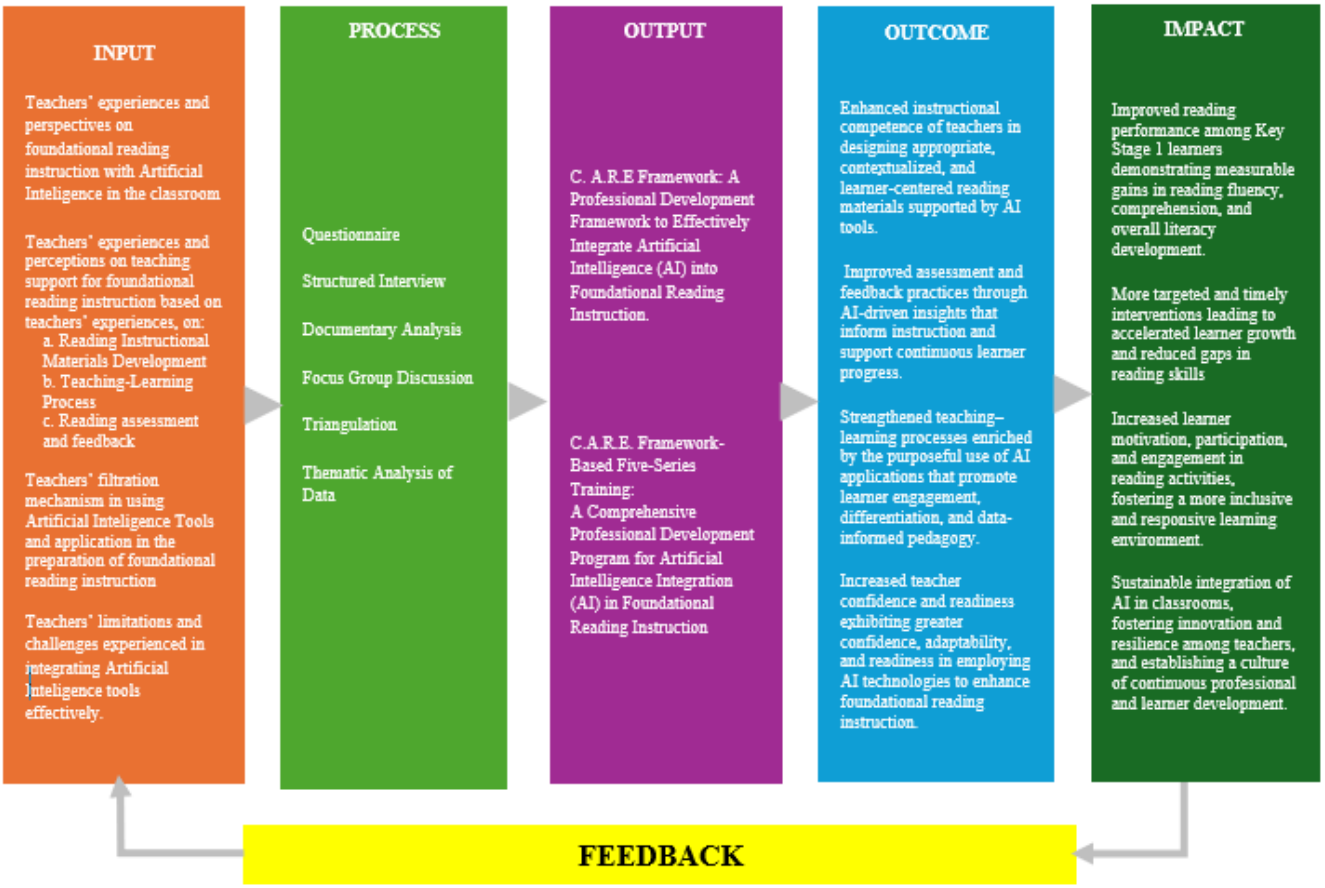
Conceptual Framework

This study is anchored on the Input-Process-Output-Outcome (IPOO) model, which illustrates the systematic flow of investigation and highlights how data are gathered, analyzed, and transformed into instructional and developmental outcomes related to the integration of Artificial Intelligence (AI) in foundational reading instruction. The input of the study centers on the experiences and perspectives of teachers who are integrating AI into foundational reading instruction, including their insights into the development of reading materials, the facilitation of the teaching, learning process, and the implementation of reading assessment and feedback. It also examines teachers' filtration mechanisms in evaluating and utilizing AI-generated content to ensure accuracy, contextual relevance, and curricular alignment, while identifying challenges such as inadequate infrastructure, limited institutional support, and insufficient professional training. To capture these inputs comprehensively, the study employed multiple qualitative instruments, questionnaires, structured interviews, documentary analysis, and focus group discussions, with triangulation enhancing credibility and trustworthiness.

The process involved the systematic collection, organization, and thematic analysis of qualitative data derived from teachers' experiences. Triangulated sources were analyzed to uncover lived experiences, adaptive strategies, and ethical considerations in AI integration. This ensured a robust understanding of how AI influences foundational reading instruction and provided the empirical basis for developing context-sensitive professional development frameworks. The output of the study consisted of two major components. The first was the C.A.R.E. Framework, a professional development framework for AI integration in foundational reading instruction, comprising four dimensions: Contextualized Adoption, which aligns AI tools with local realities and learner contexts; Adaptive Pedagogical Design, which emphasizes flexible, learner-centered instructional designs that support differentiation and engagement; Reflective Practice and Growth, which promotes continuous reflection and professional learning; and Ethical and Relational Engagement, which ensures responsible, equitable, and ethically sound integration of AI in literacy contexts. The second output was the C.A.R.E. Framework-Based Five-Series Training Program, a professional development initiative providing technical, pedagogical, and ethical competencies through workshops, collaborative learning, and reflective practice activities.

The outcomes of the study reflect enhanced teacher competence in designing contextualized, learner-centered reading materials, improved assessment and feedback practices through AI-driven insights, and strengthened teaching-learning processes characterized by purposeful AI integration. Teachers also demonstrated increased confidence and readiness in employing AI technologies, while learners showed measurable gains in reading fluency, comprehension, and motivation. Beyond these outcomes, the study anticipates long-term impacts such as equitable access to AI-supported literacy instruction, sustained teacher innovation and resilience, and a culture of continuous professional learning. Collectively, these contributions aim to future-proof foundational reading instruction by equipping teachers with the knowledge, skills, and ethical grounding necessary to harness AI as a transformative instructional tool.

Figure 1 ***Conceptual Paradigm***



III. RESULTS AND DISCUSSION

3.1 Teachers' Experiences and Perspectives on AI in Foundational Reading Instruction

3.1.1. First encounters using AI tools in your reading classes

Excitement and Curiosity in First Encounters

Teachers described their first use of AI tools in reading instruction as both exciting and impactful. Participant 3 shared, *"My first encounter with using AI tools in my reading class was both exciting and a little overwhelming… I was surprised that the tools could provide instant ideas and resources that I usually take time to prepare."* Participant 9 echoed, "*Using AI tools in my reading classes for the first time was both exciting and impactful."*

This enthusiasm reflects what Alexandrowicz (2024) identifies as transformative emotional responses that shape early adoption, while Holcombe and Wozniak (2024) emphasize relational and creative modes of AI integration that foster intrinsic motivation. Emotional engagement thus emerges as a catalyst for innovation, suggesting that early exposure programs can harness curiosity to sustain confidence and momentum in AI integration.

Beyond sparking motivation, these initial encounters also highlight the potential of AI to reduce preparation anxiety, as teachers realized that tasks which normally consumed significant time could be completed more efficiently. This reduction in workload fosters a sense of relief and confidence, encouraging teachers to experiment further with technology. In addition, early excitement signals the importance of institutionalizing introductory training programs, since structured exposure can transform

curiosity into sustained adoption. By channeling teachers' initial enthusiasm into guided practice, schools can build momentum for responsible and consistent AI integration in foundational reading instruction.

AI as a Tool for Contextualized and Personalized Content

Educators valued AI's ability to generate materials tailored to learners' contexts. Participant 1 explained, *"I asked it to create a short story contextualized based on the children's experiences in their community or place."* Participant 5 added, *"It generated a short story that was appropriate for my pupils."* These accounts illustrate how AI supports culturally responsive teaching, making reading more relatable and meaningful. Tripathi et al. (2025) found that contextualization enhances engagement, while Gay (2018) emphasized that culturally responsive pedagogy is key to readiness. UNESCO (2022) and OECD (2023) further highlight that contextualized AI outputs strengthen motivation and comprehension while ensuring cultural relevance.

Apart from engagement, contextualization also promotes equity in instruction, as learners from diverse backgrounds see their realities reflected in classroom materials. This helps reduce cultural bias and fosters inclusivity in foundational reading instruction. In addition, personalized AI outputs encourage learner autonomy, as students interact with texts that resonate with their experiences and abilities, thereby cultivating confidence and ownership of learning. Together, these implications highlight that AI's contextualized and personalized content not only enhances comprehension but also supports equitable, learner-centered literacy development.

Enhanced Engagement and Interactivity

AI tools were credited with boosting engagement through interactive features and personalized support. Participant 4 shared, *"My first encounter using AI tools in reading really captivated the interest of my learners as it was more interactive and engaging."* Participant 6 added, *"The class became more engaged through interactive questions, and struggling learners got real-time help in pronunciation."* These narratives align with Xue, Zhang, and Chen (2025), who reported that adaptive AI feedback enhances learner motivation and participation. Interactive tools thus make reading instruction more dynamic and inclusive, fostering equitable learning environments when paired with supportive structures.

Moreover, these accounts suggest that AI-driven interactivity can strengthen learner confidence, particularly for struggling readers who benefit from immediate corrective feedback. This confidence-building effect is crucial in foundational literacy, where early success often determines long-term motivation. Black and Wiliam (2009) emphasized that formative assessment and timely feedback are central to learner growth, while Freeman et al. (2014) demonstrated that active, participatory learning significantly improves student performance. In addition, Hmelo-Silver (2004) highlighted that problem-based and interactive learning approaches foster deeper understanding and collaborative skills. Johnson and Johnson (1999) further showed that cooperative learning environments enhance motivation and peer support, reinforcing the value of AI-supported interactivity. Interactive AI tools also promote collaborative learning opportunities, as students engage with technology together, sharing responses and exploring content in more participatory ways. This collaborative dimension not only enhances peer learning but also helps cultivate a classroom culture where technology is seen as a shared resource rather than an individual tool.

Practical Support for Teachers

Teachers appreciated AI's ability to streamline lesson preparation and provide instant instructional resources. Participant 3 emphasized, *"AI could help me in simple but useful ways, like creating reading materials, generating short stories, or giving comprehension questions for my pupils."* This reflects

Davis's (1989) technology acceptance model, which highlights perceived usefulness as a driver of adoption. Similarly, Zhao and Frank (2018) noted that technology reduces workload by automating routine tasks, allowing teachers to focus on pedagogy. These findings suggest that AI serves as a practical teaching assistant, enabling educators to devote more time to direct instruction and individualized learner support. Furthermore, teachers' accounts imply that AI contributes to greater instructional flexibility, as it allows them to quickly adapt materials to different learner needs and classroom contexts without extensive preparation. This adaptability is particularly valuable in foundational reading instruction, where diverse proficiency levels require differentiated approaches. In addition, AI's practical support fosters professional confidence, as teachers feel more equipped to handle instructional demands and can rely on AI to supplement their creativity and resourcefulness. By reducing preparation burdens while enhancing adaptability and confidence, AI strengthens teachers' capacity to deliver responsive and learner-centered literacy instruction.

Initial Skepticism and Technical Challenges

While enthusiasm was common, some educators encountered doubts and barriers. Participant 7 admitted, *"Though I was initially skeptical, I found it helpful in identifying struggling readers and boosting engagement, especially among shy learners. Despite challenges like poor internet, the tool proved to be a valuable support in teaching foundational reading."* This aligns with Zhao and Frank (2018), who found that infrastructure limitations often hinder technology adoption, and Ertmer (1999) emphasized the importance of addressing both technical and attitudinal barriers to build trust in educational innovations. These insights highlight that while teachers recognize AI's benefits, institutional support and reliable connectivity are essential to sustain effective integration.

Moreover, these accounts suggest that initial skepticism can serve as a protective filter, prompting teachers to critically evaluate AI outputs before fully integrating them into instruction. This cautious stance ensures that technology is not adopted blindly but is instead assessed for accuracy, relevance, and appropriateness. In addition, the persistence of technical challenges underscores the need for systemic investment in infrastructure and training, as individual teacher efforts alone cannot overcome structural barriers. Addressing these challenges through policy support and professional development can transform skepticism into confidence, enabling teachers to embrace AI as a reliable partner in literacy instruction.

3.1.2. Frequency of AI Use in Day-to-Day Teaching

Occasional Use for Specific Needs

Participant 7 reflected, *"I only use AI when I need extra materials, like differentiated tasks or contextualized passages, it's not something I rely on every day."* Although teachers expressed enthusiasm for AI's potential, many revealed that their use remains occasional and purpose-specific. They described employing AI tools selectively to generate reading materials, scaffolded activities, or supplemental tasks when faced with particular instructional needs or resource limitations. Such engagements were pragmatic, driven by AI's immediate utility in simplifying preparation or enriching specific learning experiences, rather than making it a constant feature of practice. This measured approach resonates with Hidayat, Basthomi, and Afrilyasanti (2024), who found that teachers adopt technology cautiously when benefits outweigh risks, and aligns with Magallanes, Chung, and Lee (2022), who observed that intermittent use often signals cautious but growing confidence during reform contexts.

Participants also acknowledged contextual and infrastructural realities shaping this selective adoption. Weak internet connectivity, limited resources, and concerns over data privacy often impeded regular use, translating into episodic engagement , a balance between curiosity and caution. Zhao and Frank (2018)

emphasized that infrastructure and readiness are critical to sustained adoption, while OECD (2019) highlighted equity and access as prerequisites for consistent integration. Yet even minimal exposure, such as generating reading prompts or scaffolded group tasks, sparked new instructional insights and improved differentiation, nurturing confidence and reflective practice. For schools and policymakers, these findings highlight the importance of professional development, equitable access to reliable technologies, and institutional support that encourages experimentation without compromising ethical standards. With these conditions in place, occasional and need-based use can evolve into confident, sustained integration that enriches foundational reading instruction and strengthens innovation in schools.

Regular and Integrated Use

Other teachers reported frequent use of AI for lesson planning and personalized activities. Participant 3 explained, *"I use AI whenever I need to prepare reports and create example reading materials for my lessons… It has become a regular part of my work because it saves me time and gives me helpful ideas."* Participant 7 added, *"About two to three times a week, mostly for reading and creating personalized activities."* This reflects Zhao and Frank's (2018) observation that technology becomes embedded in professional practice when it consistently reduces workload and enhances instructional quality. It suggests that AI is gradually shifting from occasional support to an integrated component of teaching routines.

Moreover, regular use indicates that teachers are developing habitual reliance on AI tools, incorporating them into their professional workflow as trusted resources rather than experimental aids. This habitual integration strengthens efficiency and consistency in instructional delivery. In addition, frequent use highlights the potential for sustained pedagogical innovation, as teachers who regularly engage with AI are more likely to explore advanced applications, adapt strategies, and refine practices over time. Darling-Hammond, Flook, Cook-Harvey, Barron, and Osher (2020) emphasized that consistent use of learning technologies fosters continuous improvement in teaching approaches, positioning technology as a stable partner in literacy instruction.

High-Frequency and Daily Use

Some educators fully embraced AI as a daily teaching companion. Participant 6 stated, *"Almost every day,"* while Participant 9 affirmed, *"Often."* Such high-frequency use aligns with Hidayat, Basthomi, and Afrilyasanti (2024), who found that teachers with strong technological self-efficacy adopt digital tools more consistently. This indicates that for certain educators, AI has become indispensable, streamlining tasks and enhancing efficiency in day-to-day instruction.

Daily integration also suggests that AI is beginning to reshape teaching routines, becoming embedded in the natural flow of lesson preparation and delivery rather than serving as an occasional supplement. This habitual use reflects growing trust in AI's reliability and usefulness. In addition, high-frequency adoption points to the potential for deeper pedagogical transformation, as teachers who consistently rely on AI are more likely to experiment with advanced features, refine instructional strategies, and innovate in literacy practices. Zhou, Li, and Chen (2024) emphasized that teacher resilience and professional learning communities support sustained technology adoption, while Darling-Hammond, Flook, Cook-Harvey, Barron, and Osher (2020) highlighted that consistent use of learning technologies fosters continuous improvement in teaching approaches. Thus, daily use not only enhances efficiency but also signals a shift toward sustained, technology-supported pedagogy in foundational reading instruction.

Infrequent or Unspecified Use

A few responses were vague or indicated minimal engagement. Participant 8 responded, *"Sometimes,"* suggesting transitional phases or limited access. This reflects Magallanes, Chung, and Lee (2022), who

noted that uncertainty and lack of training often result in sporadic use. Such findings imply that institutional support and capacity-building are needed to move teachers from tentative experimentation toward consistent integration.

Additionally, infrequent use highlights the risk of uneven adoption, where some classrooms benefit from AI integration while others remain dependent on traditional methods, potentially widening instructional gaps. It also underscores the need for confidence-building measures, since teachers who are unsure of AI's reliability may hesitate to use it regularly. Structured training, peer sharing, and gradual exposure can help transform sporadic engagement into consistent practice, ensuring that AI becomes a stable and equitable support across diverse teaching contexts. Zhao and Frank (2018) emphasized that infrastructure and readiness are critical to sustained adoption, while OECD (2019) highlighted equity and access as prerequisites for consistent integration.

3.1.3. AI Tools with the Most Positive Impact on Reading Instruction

AI Tools for Generating Contextualized Reading Materials

Teachers emphasized the value of AI tools that generate short stories, passages, and comprehension questions aligned with learners' backgrounds. Participant 1 stated, *"The AI tools that helped me the most are those that can generate short stories and reading passages aligned with my students' backgrounds like Cici and ChatGPT."* Participant 3 added, *"These tools lessen my workload and allow me to focus more on guiding my pupils in actual reading practice."* This reflects Hidayat, Basthomi, and Afrilyasanti (2024), who found that differentiated and contextualized instruction enhances learner engagement by connecting content to lived experiences. Such tools reduce teacher workload while promoting culturally responsive instruction.

This further implies that contextualized AI materials foster greater learner relatability, as pupils see their own communities and experiences reflected in texts, which strengthens comprehension and motivation. Notably, these tools also support instructional efficiency, enabling teachers to redirect their time and energy from material creation toward interactive teaching and individualized support. UNESCO (2022) emphasized that culturally responsive and contextualized AI applications enrich literacy instruction by making it more inclusive, responsive, and learner-centered.

Multimedia and Video-Based AI Tools for Remediation

Some educators found multimedia platforms impactful for remediation. Participant 4 shared, *"The use of YouTube in reading remediation of my class made the most positive impact to my learners."* This aligns with Mayer (2021), who noted that multimodal learning tools foster differentiated instruction by catering to diverse learning needs. Video-based platforms complement text-based AI, making literacy instruction more engaging and accessible.

Equally important, multimedia tools provide alternative pathways for struggling learners, offering visual and auditory reinforcement that strengthens comprehension and retention. In addition, video-based AI platforms encourage self-paced learning, as students can revisit lessons, pause explanations, and practice independently, which supports remediation outside the classroom. OECD (2023) emphasized that digital and multimedia tools expand opportunities for differentiated and autonomous learning. Taken together, these benefits highlight that multimedia and video-based AI tools not only enhance engagement but also broaden access to equitable literacy development.

AI for Grammar and Writing Support

Participant 5 explained, *"ChatGPT (for different activities) and Grammarly (for editing and checking of grammar)."* Holcombe and Wozniak (2024) emphasized that AI enhances instructional quality by

reducing errors. Grammar support tools ensure accuracy and efficiency in material preparation. Additionally, these tools promote professional confidence, as teachers can rely on AI to refine their outputs and minimize mistakes before presenting materials to learners.

Equally important, grammar and writing support fosters modeling of good writing practices, since teachers who consistently use AI for editing are better positioned to demonstrate accuracy and clarity in classroom instruction. Xu, Wang, and Yu (2023) further highlighted that AI-assisted writing tools improve both teacher productivity and learner outcomes by reinforcing precision and effective communication. Taken together, these benefits show that AI grammar tools not only streamline preparation but also elevate instructional standards by reinforcing accuracy and clarity in literacy teaching.

Productivity and Instructional Planning Tools

Teachers in this study recognized the substantial role of Artificial Intelligence (AI) platforms such as Microsoft 365 Co-Pilot and ChatGPT in optimizing lesson planning and streamlining instructional tasks. Rather than functioning as external add-ons, these technologies were seamlessly integrated into teachers' professional routines, supporting planning, material development, and classroom organization. Participant 6 shared, *"Co-Pilot in Microsoft 365 and ChatGPT."* Zhao and Frank (2018) observed that technology embedded in productivity suites improves efficiency. Institutional adoption of such tools can reduce planning burdens and enhance learner-centered instruction.

By automating repetitive processes and offering instant access to instructional templates or activity suggestions, AI enabled educators to redirect their energy toward high-impact teaching interactions and the cultivation of meaningful learner relationships, core dimensions of effective literacy instruction. Consistent with these insights, UNESCO (2022) highlighted that AI-driven productivity tools substantially reduce workload while enhancing pedagogical design. Similarly, OECD (2023) emphasized that data-informed customization empowers teachers to create differentiated lesson plans, monitor learner progress, and make evidence-based instructional decisions, thereby reducing occupational stress and fostering more organized classroom practices.

The implications of these findings are significant. First, productivity-oriented AI tools function as enablers of pedagogical agility and teacher well-being, not replacements for professional judgment. Second, when institutions provide reliable infrastructure, technical support, and professional guidance, AI systems can transform instructional planning into a more creative, reflective, and learner-centered endeavor. Third, this alignment between technology and pedagogy underscores the evolving identity of teachers as adaptive designers of meaningful literacy experiences. Finally, the study points to the need for sustained institutional mechanisms, including policy frameworks, professional development, and ethical safeguards, that ensure AI integration remains anchored in human judgment, empathy, and the broader goal of nurturing inclusive literacy learning environments.

Assessment and Personalization Apps

Participant 7 explained, *"The most helpful AI tools in my reading instruction are apps that assess reading fluency and suggest personalized activities."* Educators in this study recognized the transformative role of such AI-powered assessment tools in strengthening foundational reading instruction. These technologies enhanced diagnostic precision and personalized the learning process by continuously tracking fluency, comprehension, and engagement. Teachers were able to identify learning gaps early and respond with differentiated strategies suited to each learner's developmental stage, a capability especially valuable in classrooms with diverse reading abilities.

In alignment with these observations, Xu, Wang, and Yu (2023) demonstrated how AI-assisted writing and assessment tools generate meaningful data to guide instruction, while UNESCO (2022) identified adaptive platforms such as Microsoft Reading Progress and Lexia Core5 as effective tools that provide guided feedback, leveled texts, and real-time tracking. Teachers in this study reported that such platforms enhanced their confidence in making informed pedagogical decisions and strengthened their ability to design targeted interventions based on learner analytics.

The implications are substantial. First, AI-supported assessment redefines literacy pedagogy from static evaluation to a dynamic process of continuous feedback and tailored support. Second, these tools enable early identification and equitable intervention, ensuring struggling readers receive timely, personalized assistance. Third, they enhance instructional precision and teacher confidence, as data-driven insights guide pedagogical decisions while reducing workload. Finally, the findings highlight the need for institutional frameworks and professional development that ensure responsible use, ethical data management, and equitable access. When supported by secure infrastructure and reflective practice, AI-based assessment systems can serve not merely as measures of learning but as catalysts for growth, inclusion, and literacy excellence.

Diverse AI Tools for Engagement and Exploration

Participant 8 shared, *"Game apps, ChatGPT, and Perplexity,"* while Participant 9 added, *"Google Gemini, ChatGPT, and CiCi."* This reflects Hidayat, Basthomi, and Afrilyasanti (2024), who noted that differentiated and diverse technology adoption fosters creativity and adaptability. Varied tools allow teachers to tailor instruction to different learner profiles.

Viewed from a broader perspective, the use of varied AI platforms highlights how flexibility and inclusivity in pedagogy allow teachers to adapt instruction to diverse learner preferences and abilities. Multimodal and gamified approaches foster creativity, persistence, and autonomy, qualities foundational to lifelong literacy development (Khalil & Er, 2023). At the same time, diverse adoption underscores the importance of teacher agency and adaptability, positioning educators as designers who strategically combine tools to maximize engagement and comprehension. For institutions, this points to the need for structured support and enabling policies that encourage creative digital pedagogy while safeguarding equitable access and ethical use. When thoughtfully integrated, diverse AI tools can evolve from isolated experimentation into sustainable practices that enrich literacy learning and empower students to co-construct meaning, explore independently, and take ownership of their literacy journey.

3.1.4. Influence of AI on Teacher–Student Interaction During Reading Sessions

Enhanced Engagement Through Contextualized and Relatable Materials

Participant 1 shared, *"AI-generated reading materials have improved the reading engagement of my learners because they can relate their personal experiences."* Teachers in this study observed that contextualized and relatable content transformed reading sessions into spaces of recognition and connection, allowing students to engage both cognitively and emotionally. When stories reflected children's realities, they became mirrors of self and community, fostering deeper comprehension and motivation. This reflects Tripathi, Singh, and Kumar (2025), who found that contextualized AI outputs enhance learner engagement by connecting content to lived experiences.

Viewed more broadly, personalization through AI fostered dynamic classroom interactions where learners demonstrated greater motivation, sustained focus, and improved comprehension. Teachers noted that culturally aligned reading activities bridged affective and academic engagement, particularly for multilingual and marginalized students, creating inclusive environments where learners felt represented

and valued. Gay (2018) emphasized that culturally responsive teaching strengthens both identity and literacy, while UNESCO (2022) underscored the importance of equitable access to AI platforms capable of generating culturally relevant materials. When embedded within institutional systems, contextualized AI instruction transforms reading into a culturally anchored, interactive process that strengthens literacy proficiency and affirms learner identity.

Increased Teacher Focus on Student Needs

Participant 3 emphasized, *"AI plays a paramount role… It should not replace teachers but serve as a tool to make learning better."* Teachers in this study observed that AI-generated reading materials enhanced student engagement, particularly when texts were culturally attuned and personally relevant. Learners became more eager participants when stories mirrored their experiences, values, and linguistic contexts, strengthening both comprehension and motivation. This reflects Tripathi, Singh, and Kumar (2025), who found that contextualized AI outputs enhance instructional quality and learner engagement by connecting content to lived experiences.

Seen more broadly, the integration of culturally responsive AI tools allowed teachers to devote more time to observing, supporting, and interacting with learners, creating classrooms that were more inclusive and responsive to diverse linguistic and cultural backgrounds. Bandura's (1997) notion of self-efficacy resonates here, as teachers reported greater confidence in prioritizing student growth when AI reduced routine burdens and provided actionable insights. Gay (2018) emphasized that culturally responsive teaching strengthens both identity and literacy, while UNESCO (2022) underscored the importance of equitable access to AI platforms and professional development that equips teachers to adapt outputs ethically and creatively. When embedded within institutional systems, AI becomes a catalyst for learner-centered pedagogy, ensuring that technology amplifies, rather than replaces, the human connections at the heart of literacy instruction.

Personalization and Differentiation of Instruction

Participant 6 shared, *"AI allows me to adjust reading levels based on performance, providing scaffolding that supports the process of learning to read."* Teachers in this study emphasized that AI tools enabled them to tailor reading instruction to individual learner needs, fostering inclusivity and responsiveness in classrooms with diverse literacy levels. By customizing materials and feedback, instruction became collaborative and engaging, accommodating distinct abilities and learning rhythms. This perspective aligns with Xue, Zhang, and Chen (2025), who demonstrated that adaptive AI feedback enhances learner motivation and participation by personalizing tasks to developmental needs.

Platforms such as Khan Academy's Khanmigo illustrate AI's capacity to adapt instruction in real time, supporting both advanced learners and English Language Learners through personalized grammar and reading tasks (Tripathi, Singh, & Kumar, 2025). Viewed more broadly, AI-supported differentiation reduced cognitive and logistical burdens on teachers while ensuring that all learners received instruction tailored to their developmental stage and competencies. Teachers reported greater confidence in managing heterogeneous groups and sustaining motivation, particularly in contexts such as DepEd Sorsogon City Elementary Schools where classrooms encompass a wide spectrum of literacy abilities.

For schools and policymakers, these findings highlight the importance of integrating AI tools that facilitate differentiated instruction and equipping teachers through training programs to design adaptive learning pathways while maintaining rigorous pedagogical standards. When embedded into everyday practice, AI becomes a critical enabler of equitable, flexible, and student-centered literacy instruction.

Mixed Impact on Independent Reading Skills

Participant 2 observed, *"YouTube videos capture my learners' interest, but some pupils tend to memorize the words rather than understanding them."* Teachers acknowledged that multimedia AI tools such as YouTube were highly effective in capturing student interest and enhancing engagement, yet they also raised concerns about comprehension and independent reading. Some learners focused on memorization rather than interpretation, underscoring the challenge of balancing motivation with cognitive depth. Ahmad, Shafie, and Jan (2020) cautioned that while interactive multimedia can boost engagement, careful design is necessary to strengthen decoding and comprehension, especially for struggling readers.

At the same time, these findings illustrate that multimedia tools are not neutral; their educational value depends on deliberate integration into pedagogy. Tripathi, Singh, and Kumar (2025) emphasized that AI-supported platforms, though effective for fluency and scaffolding, must be paired with teacher-led guidance to cultivate interpretive skills and critical thinking. Teachers in this study stressed that multimedia works best as part of a scaffolded literacy framework, combined with guided instruction, reflective questioning, and opportunities for independent reading. For schools and policymakers, this signals the importance of professional development that equips teachers with strategies to integrate multimedia AI tools strategically, ensuring they foster meaningful, independent, and sustainable literacy growth.

Simplification and Enrichment of Reading Activities

Participant 5 shared, *"AI helps me make reading sessions easier and more meaningful because it provides engaging activities with comprehension questions."* Teachers in this study valued how AI tools streamlined lesson delivery and enriched the reading experience. AI-generated activities and comprehension questions allowed educators to focus more on guiding and engaging learners, while providing structured, leveled, and interactive materials that supported both teacher goals and student needs. This perspective aligns with Xue, Zhang, and Chen (2025), who demonstrated that adaptive AI feedback enhances learner motivation and participation by tailoring literacy tasks to student levels. Teachers also highlighted that AI platforms can provide multimodal support, such as read-aloud audio, vocabulary scaffolds, and comprehension quizzes, that make reading activities more accessible and engaging. Tripathi, Singh, and Kumar (2025) emphasized that AI-supported classrooms benefit from instructional efficiency, as automated content generation and adaptive feedback reduce teacher workload while sustaining student engagement.

Taken together, the findings show that AI supports both instructional efficiency and student engagement. Automated content generation, adaptive feedback, and multimodal support fostered a more responsive and interactive learning environment, enabling teachers to personalize instruction and address diverse classroom needs. While multimedia tools like YouTube were praised for capturing interest, concerns remained about their impact on independent reading skills, underscoring the need for balanced integration. For schools and policymakers, this highlights the importance of supporting teachers with training programs that emphasize best practices for AI use, balancing engagement with comprehension, ensuring inclusivity, and fostering independent reading skills. When strategically embedded, AI becomes not just a convenience but a means of elevating instructional quality and creating responsive, learner-centered literacy environments.

3.1.5. The Role of AI in Foundational Reading Instruction

AI as a Supportive and Complementary Tool

Teachers in this study consistently viewed AI as an enabling tool rather than a substitute for human

teaching. Participant 1 explained, *"AI can help the teachers in generating contextualized stories… but it should not replace teachers,"* while Participant 8 emphasized that AI should support, not replace, foundational reading instruction. This perspective reflects recognition of the teacher's unique role in fostering relationships, guiding creativity, and supporting critical thinking. Holcombe and Wozniak (2024) similarly argued that AI fosters engagement but must remain complementary to human expertise, while Tripathi, Singh, and Kumar (2025) highlighted that AI can ease instructional burdens and personalize learning without replicating the relational and ethical dimensions of teaching.

More broadly, scholars and policymakers stress that AI integration must be deliberate and balanced. Gay (2018) underscored that culturally responsive pedagogy requires human judgment and empathy, while UNESCO (2022) cautioned against over-reliance on AI, noting risks to creativity and inclusivity. Taken together, these insights highlight the importance of professional development that equips teachers to use AI effectively, positioning it as a supportive assistant rather than a replacement. When embedded thoughtfully, AI strengthens instructional delivery and learner engagement while safeguarding the centrality of teacher-student relationships, particularly in communities where these connections are pivotal for literacy outcomes.

Personalization and Differentiation of Learning

Teachers in this study emphasized AI's capacity to tailor instruction to individual learner needs, accommodating diverse reading abilities and learning styles. Participant 6 reflected, *"AI allows me to adjust reading levels based on performance, providing scaffolding that supports the process of learning to read."* By enabling students to progress at their own pace, AI-supported instruction fostered inclusive and responsive learning experiences. Educators reported that AI tools adjusted reading levels and scaffolded tasks, making learning more enjoyable while supporting academic, linguistic, and emotional development. Evidence of this can be seen in platforms such as Khan Academy's Khanmigo, which adapts grammar and reading lessons in real time for both advanced learners and English Language Learners, providing immediate, personalized feedback (Tripathi, Singh, & Kumar, 2025; Xue, Zhang, & Chen, 2025).

These insights underscore that personalization is not merely an instructional preference but a critical component of effective foundational literacy teaching. Adaptive AI feedback has been shown to enhance learner motivation and participation by tailoring tasks to developmental needs (Xue et al., 2025), while AI-supported classrooms improve instructional quality and reduce teacher workload (Tripathi et al., 2025). Teachers in this study observed that learners responded positively to materials reflecting their personal experiences and developmental stages. For schools and policymakers, the findings highlight AI as a powerful enabler of inclusive and adaptive literacy instruction. Professional development and thoughtful integration of AI tools can enhance teacher effectiveness, strengthen instructional design, and cultivate equitable, student-centered reading experiences, particularly in multilingual and multi-level classrooms such as those in many Philippine barangays.

Resource Creation and Instructional Efficiency

Participant 2 stated, *"The role of AI in foundational reading instruction is to give support in creating reading materials to enhance interaction."* Educators in this study recognized AI as a practical, time-saving tool for streamlining lesson preparation and generating high-quality instructional materials. Teachers noted how AI helped them create targeted resources, such as phonics-based sentence pyramids, which enhanced learner interaction and engagement. This growing appreciation reflects AI's ability to support instructional design, allowing teachers to focus more on facilitation and learner-centered strategies

while maintaining rigor and relevance. Tripathi, Singh, and Kumar (2025) similarly found that AI improves instructional efficiency while maintaining teacher oversight, underscoring that deliberate tool selection allows technology to complement rather than replace traditional reading instruction.

Additional support comes from AI-enabled educator platforms that provide training and tools to help teachers save time and personalize instruction. These resources empower educators to design flexible, engaging, and standards-aligned content with minimal effort, reducing the burden of manual preparation while preserving instructional quality. In contexts such as Sorsogon City, where teachers often juggle multiple roles, AI-supported planning offered a sustainable pathway to effective and inclusive literacy instruction. For schools and policymakers, these findings highlight the importance of professional development programs focused on AI integration, equitable access to technology, and frameworks that reinforce the teacher's central role. When strategically embedded, AI serves as a supportive partner that enhances instructional efficiency, facilitates personalized learning, and promotes inclusive literacy practices while safeguarding the relational and ethical aspects of teaching.

3.2. Teachers' Perceptions of AI as a Support Tool in Foundational Reading Instruction

3.2.1. Strategies for Integrating AI in Lesson Delivery

Content Generation and Differentiation

Teachers in this study increasingly relied on AI to generate contextualized and differentiated reading materials, enabling instruction to be tailored to diverse learner profiles. Participant 1 shared, *"I use AI to create short stories, reading passages, and vocabulary activities that reflect students' real-life contexts,"* while Participant 3 added, *"I use AI to make reading materials, questions, and activities that match my pupils' level, and to help me save time in lesson planning."* AI-supported content allowed educators to design lessons that reflected students' experiences, making reading tasks more engaging and relatable. It also facilitated leveled worksheets and activities, providing simplified content for struggling readers and more challenging tasks for advanced learners. Research confirms that adaptive AI feedback enhances learner motivation and participation by tailoring tasks to developmental needs (Xue, Zhang, & Chen, 2025), while AI-supported classrooms improve instructional quality and reduce teacher workload (Tripathi, Singh, & Kumar, 2025).

More broadly, these findings illustrate that AI empowers teachers to deliver personalized instruction while maintaining control over content relevance and academic rigor. Teachers observed that learners responded positively to materials reflecting their personal experiences and developmental stages, which boosted motivation and comprehension. For schools and policymakers, this underscores the importance of integrating AI-based differentiation into teacher training and classroom practice. Providing professional support and equitable access to AI tools ensures that personalization strengthens inclusive literacy instruction while safeguarding the teacher's professional judgment. When strategically embedded, AI becomes a powerful enabler of equitable, flexible, and student-centered literacy instruction.

Multimedia and Interactive Tools

Teachers in this study reported that AI-powered multimedia resources enhanced learner engagement and supported oral language development. Participant 2 explained, *"I use videos like songs for motivation and games to integrate AI in lesson delivery, but I don't frequently use it because of limited resources and unstable internet connection,"* while Participant 4 added, *"In our read-aloud activity, I use AI to improve pronunciation and fluency."* Videos, songs, interactive games, and AI-supported read-aloud activities were used to strengthen vocabulary, comprehension, and fluency, reflecting a broader shift toward

multimodal literacy practices. Plata et al. (2024) found that interactive e-books and gamified platforms enhance foundational literacy by addressing diverse learning styles, while Tripathi, Singh, and Kumar (2025) emphasized that AI-supported tools such as Reading Progress and intelligent tutoring systems provide real-time feedback and adapt to learner pace.

Educators observed that multimedia tools sustained learner attention and reinforced literacy concepts through multiple modalities, with features such as text-to-speech, animations, and gamified apps increasing motivation and comprehension. Despite challenges related to unstable connectivity and limited resources, teachers valued how even occasional integration of multimedia enriched classroom interaction and made reading instruction more dynamic and participatory. Collectively, these findings illustrate that AI-driven multimedia tools foster differentiated instruction and inclusive literacy practices. For schools and policymakers, this underscores the importance of providing training and equitable access to technology so teachers can integrate multimedia effectively, cultivating independent reading skills and ensuring learners benefit from rich, multisensory literacy experiences.

Skill-Based Alignment

Teachers in this study emphasized the deliberate alignment of AI tools with specific reading competencies, ensuring that technology supported targeted instructional goals rather than functioning as a generic aid. Participant 1 explained, *"I align AI tools with my teaching objectives… For comprehension, I use AI to generate questions; for vocabulary, I use contextualized word activities,"* while Participant 6 added, *"For decoding, fluency, comprehension, and vocabulary building, I use AI tools that match these domains."* By mapping AI use to domains such as decoding, fluency, comprehension, and vocabulary, educators maintained instructional relevance while enhancing learner engagement. This purposeful integration reflects Davis's (1989) technology acceptance model, which highlights perceived usefulness as central to adoption, and Bandura's (1997) emphasis on confidence in applying tools effectively.

Platforms such as Lexia Core5 provide adaptive exercises that respond to learner performance, balancing scaffolding and challenge while reinforcing discrete literacy skills (Hurwitz, Elliott, & Wolf, 2022; RAND Corporation, 2023). Complementary evidence from differentiated instruction practices demonstrates measurable improvements in comprehension when AI is strategically aligned with objectives (Hidayat, Basthomi, & Afrilyasanti, 2024). In practice, teachers reported that skill-based alignment allowed them to scaffold tasks more precisely, generate leveled comprehension questions, and design vocabulary activities that reflected students' contexts. Collectively, these findings illustrate that AI functions as a precision tool in literacy instruction, facilitating deliberate skill development, supporting differentiated learning pathways, and ensuring coherence with curriculum standards. For schools and policymakers, this underscores the importance of professional development and equitable access to validated AI platforms, enabling teachers to integrate AI thoughtfully while safeguarding instructional rigor and teacher-led oversight.

3.2.2. Aligning AI Tools with Teaching Objectives in Reading

Skill-Based Alignment

Teachers in this study emphasized the deliberate alignment of AI tools with specific reading competencies, ensuring that technology supported targeted instructional goals rather than functioning as a generic aid. Participant 1 explained, *"I align AI tools with my teaching objectives… For comprehension, I use AI to generate questions; for vocabulary, I use contextualized word activities,"* while Participant 6 added, *"For decoding, fluency, comprehension, and vocabulary building, I use AI tools that match these domains."* By mapping AI use to domains such as decoding, fluency, comprehension, and vocabulary, educators

maintained instructional relevance while enhancing learner engagement. This purposeful integration reflects Davis's (1989) technology acceptance model, which highlights perceived usefulness as central to adoption, and Bandura's (1997) emphasis on confidence in applying tools effectively.

Platforms such as Lexia Core5 provide adaptive exercises that respond to learner performance, balancing scaffolding and challenge while reinforcing discrete literacy skills (Hurwitz, Elliott, & Wolf, 2022; RAND Corporation, 2023). Complementary evidence from personalized AI reading platforms demonstrates measurable improvements in comprehension when AI is strategically aligned with objectives (Hidayat, Basthomi, & Afrilyasanti, 2024). In practice, teachers reported that skill-based alignment allowed them to scaffold tasks more precisely, generate leveled comprehension questions, and design vocabulary activities that reflected students' contexts. Collectively, these findings illustrate that AI functions as a precision tool in literacy instruction, facilitating deliberate skill development, supporting differentiated learning pathways, and ensuring coherence with curriculum standards. For schools and policymakers, this underscores the importance of professional development and equitable access to validated AI platforms, enabling teachers to integrate AI thoughtfully while safeguarding instructional rigor and teacher-led oversight.

Contextualization and Relevance

Teachers in this study consistently emphasized the importance of adapting AI-generated content to learners' cultural backgrounds, interests, and daily experiences. Participant 2 shared, *"I align AI tools in my teaching objectives in reading by contextualizing text based on my learners' needs,"* while Participant 5 added, *"I make sure that the reading activities I provide from AI tools will help achieve the objectives or goals I have set for the day."* By modifying texts and activities to make them more relatable, educators ensured that lessons connected with students' lived realities while still meeting grade-level standards. Research confirms that contextualization enhances engagement and relevance fosters meaningful learning (Tripathi, Singh, & Kumar, 2025; Hidayat, Basthomi, & Afrilyasanti, 2024). Teachers observed that contextualized AI materials increased motivation, improved comprehension, and encouraged active participation in reading tasks.

Broader studies reinforce these findings, showing that culturally responsive approaches in AI integration enhance ethical awareness and deeper learning. Eguchi, Okada, and Muto (2021) highlighted that tools aligned with students' social and cultural realities foster inclusivity, while Wu (2024) emphasized that adaptive AI technologies are most effective when embedded within curricula that reflect learners' real-life experiences. Collectively, these insights underscore that contextualization is critical for meaningful and equitable AI-supported literacy instruction. For schools and policymakers, this calls for professional development that equips teachers with strategies for contextualized AI use and frameworks that ensure inclusive access to adaptive technologies. Thoughtful implementation allows AI to serve as a complementary resource that honors learners' experiences, strengthens comprehension, and fosters equitable literacy outcomes across diverse classroom settings.

Instructional Planning and Monitoring

Teachers in this study emphasized the importance of strategically integrating AI into lesson planning and progress monitoring to align instruction with clearly defined objectives and curriculum standards. Participant 9 explained, *"We need to start with clear objectives. Match the AI tool to the skills. Embed AI activities in the lesson plan. Encourage Higher Order Thinking Skills (HOTs) and monitor,"* while Participant 4 added, *"I make it sure that technology supports rather than distracts. Before I use AI, I have first to identify the teaching objectives and select the AI tool that is appropriate."* Educators adopted

structured approaches, beginning with explicit goals, embedding AI-supported activities, and fostering higher-order thinking skills while ensuring technology reinforced rather than detracted from lesson quality. Research shows that adaptive AI assessments provide data-driven insights, supporting differentiated instruction and enabling teachers to adjust strategies in real time (Xue, Zhang, & Chen, 2025).

Broader studies echo these findings, noting that AI reduces teacher workload and allows educators to redirect time from administrative tasks toward creative, student-centered instruction (Belloula, 2025). Main (2025) conceptualized AI as a "thinking partner" in instructional planning, aiding teachers in designing curriculum-aligned content, formative assessments, and differentiated activities. Similarly, evidence highlights the importance of clear objectives, pedagogical alignment, and content customization when integrating AI into lesson delivery (Tripathi et al., 2025). Teachers in this study reported leveraging AI to target specific reading skills, comprehension, vocabulary, fluency, and decoding, while adapting materials to suit learners' contexts and instructional goals. Collectively, these insights highlight that deliberate AI integration strengthens instructional planning, facilitates continuous monitoring, and enhances foundational literacy outcomes. For schools and policymakers, this underscores the need for professional development that equips teachers to align AI activities with curriculum goals, select appropriate tools, and monitor learner progress effectively, ensuring responsive and equitable literacy instruction.

3.2.3. AI as a Complement to Traditional Teaching Approaches

Efficiency and Customization

Teachers in this study emphasized that AI tools significantly streamline lesson preparation while enabling the creation of personalized reading materials. Participant 1 explained, *"When my objective is comprehension, I use AI to generate questions… For vocabulary enrichment, I generate contextual word activities,"* while Participant 7 added, *"I choose AI tools that match my goals, like improving fluency, comprehension, and vocabulary. I use them to support my lessons, track progress, and give activities that fit each learner's level."* By generating contextualized stories, vocabulary tasks, and comprehension questions tailored to learner needs, educators were able to plan more efficiently and devote greater attention to facilitation and individualized support. Zhao (2025) similarly noted that AI enhances instructional efficiency while maintaining focus on targeted learning outcomes, underscoring that deliberate tool selection allows technology to complement rather than replace traditional reading instruction.

Empirical evidence reinforces these observations. Hidayat (2024) demonstrated that students using AI-based personalized reading platforms achieved significantly higher comprehension scores than control groups, showing that personalization made efficient through AI can yield measurable improvements in literacy outcomes. Consequently, practitioners are urged to embed AI tools strategically into planning workflows, using automation not merely to expedite preparation but to create differentiated, learner-tailored experiences. At the policy level, educational leaders must ensure equitable access to validated AI platforms and provide professional development that equips teachers to redeploy saved time into richer student-teacher interaction. In this way, efficiency is transformed into higher quality, personalized reading instruction that better meets diverse student needs, thereby advancing inclusive and responsive literacy practices.

Multimedia Integration and Interactive Learning

Teachers in this study highlighted how AI introduced multimedia elements that enriched traditional

methods, shifting from static print visuals to dynamic presentations, read-aloud activities, and interactive fluency drills. Participant 2 explained, *"AI tools complement my teaching approaches… by using PowerPoint presentations instead of printing all the visual aids, and by playing songs for motivation,"* while Participant 4 added, *"With AI, I can make instructional materials in an instant and more engaging."* These practices made foundational reading instruction more engaging and responsive to diverse learning styles. Research supports this perspective, showing that AI-enabled creativity fosters multisensory learning and sustains learner engagement (Holcombe & Wozniak, 2024). Shafiee Rad (2025) further found that AI interventions supporting second language reading comprehension significantly improved learner engagement and self-regulated reading behaviors, underscoring the value of interactive and adaptive features.

The integration of multimedia through AI carries important implications for practice. By embedding audio, visual, and interactive scaffolding into lessons, educators can foster deeper learner involvement and sustain motivation, particularly in early literacy contexts. Consequently, instructional leaders must invest in infrastructure, devices, connectivity, and software licenses, and provide training that equips teachers to harness multimedia features effectively. In doing so, schools can transform reading instruction into a dynamic, multi-sensory process that sustains attention while strengthening comprehension and fluency. Ultimately, thoughtful adoption of AI-enabled multimedia ensures that efficiency translates into inclusivity, allowing teachers to meet diverse cognitive and sensory needs while maintaining pedagogical coherence.

Shift Toward Learner-Centered Instruction

Teachers in this study observed that AI contributed to a notable shift from teacher-centered to learner-centered literacy instruction. Participant 1 explained, *"AI tools complement my traditional teaching approaches by helping me prepare customized stories, comprehension questions, and vocabulary tasks more efficiently,"* while Participant 9 added, *"AI promotes personalization of learning and increased learners' engagement."* By enabling students to work at their own pace, select leveled materials, and engage in self-guided exploration, AI fostered autonomy and collaborative engagement. Research supports this perspective, noting that affective investment drives adoption (Alexandrowicz, 2024) and confidence is critical in fostering innovation (Bandura, 1997). A recent meta-analysis further demonstrated that AI-assisted personalized learning has moderately positive effects on student outcomes, showing that technology tailored to individual learner profiles enhances both autonomy and engagement (Ma & Chen, 2024).

This shift carries significant implications for practice and policy. Teachers are encouraged to position AI tools as enablers of student agency rather than mere content delivery mechanisms, facilitating pathways where learners self-monitor progress and reflect on growth. Consequently, curricula, grouping practices, and assessment schedules must evolve to support flexible, learner-driven literacy experiences. At the institutional level, educational leaders should endorse frameworks that integrate AI into learner-centered pedagogies while ensuring equitable access and professional development. Ultimately, thoughtful adoption of AI transforms reading instruction into a dynamic, inclusive process centered on student choice, growth, and engagement, thereby strengthening both personalization and instructional quality.

3.2.4. Scaffolding AI-Supported Activities Across Reading Levels

Differentiation Based on Reading Proficiency

Teachers in this study consistently emphasized modifying AI-generated materials to suit learners' proficiency levels, ensuring that all students engage meaningfully with core content. Participant 1

explained, *"For struggling readers, I simplify AI-generated texts and add visuals. For advanced readers, I extend tasks with higher-order questions,"* while Participant 5 added, *"I scaffold AI-supported activities by ensuring they are suited for my Grade 2 pupils, modifying them according to their levels."* Struggling readers benefited from simplified texts and visual scaffolds, average learners worked with grade-level materials, and advanced students tackled higher-order comprehension tasks. Research confirms that differentiated AI use supports inclusivity and equity, reinforcing the importance of scaffolding to promote individualized growth (Ch'ng, 2024).

Empirical evidence further demonstrates the effectiveness of AI in facilitating differentiated literacy instruction. Ch'ng (2024) highlighted that AI enhances instructional planning by enabling teachers to design tasks responsive to diverse needs, track progress, and adapt instruction in real time. Collectively, these findings underscore that thoughtful AI integration, combined with teacher-led scaffolding—ensures differentiation remains pedagogically intentional, fostering equity, engagement, and measurable improvements in literacy development.

Contextualization and Relevance in Scaffolding

Teachers in this study emphasized that effective AI integration extends beyond differentiation; it requires contextualization to ensure that reading materials reflect learners' cultural, linguistic, and cognitive backgrounds. Participant 2 shared, *"I scaffold AI-supported activities by contextualizing the texts or stories to make them suitable to the reading level of my learners,"* while Participant 4 added, *"I make it sure that it is leveled to the different learning abilities of the children."* By tailoring AI-generated content to students' lived experiences, readiness, and interests, educators created activities that were meaningful and relevant, thereby promoting engagement and accessibility. Research confirms that contextualization fosters stronger connections between learners and content, strengthening instructional quality and learner motivation (Tripathi, Singh, & Kumar, 2025).

Further evidence shows that adaptive AI technologies are most effective when embedded within curricula that reflect learners' real-life experiences. Wu (2024) demonstrated that contextualized integration of AI in literacy instruction enhances inclusivity, comprehension, and learner engagement. Collectively, these findings affirm that situating AI content within learners' social, linguistic, and developmental realities promotes equity and accessibility. Consequently, teachers must actively modify AI-generated resources to ensure alignment with students' cultural and cognitive contexts. At the institutional level, professional development should include training in culturally responsive AI practices, emphasizing personalization without sacrificing academic rigor. By intentionally contextualizing AI-supported literacy activities, schools can leverage technology to bridge learning gaps, foster engagement, and cultivate inclusive learning environments that support all learners.

Grouping and Instructional Design

Teachers in this study emphasized that scaffolding AI-supported activities often involves grouping learners according to proficiency and embedding AI tasks purposefully within lesson design. Participant 7 explained, *"I group students by reading ability and use AI tools to give each group tasks suited to their level,"* while Participant 6 added, *"In pre-reading, I use AI to build background knowledge and spark curiosity."* This structured approach ensured that AI complemented developmental stages, supported differentiated instruction, and maximized learning outcomes. Research confirms that structured grouping enhances differentiated instruction and that careful planning ensures AI activities remain aligned with objectives rather than serving as distractions (Xue, Zhang, & Chen, 2025).

Broader studies corroborate AI's role in reshaping instructional design and classroom organization. Ch'ng

(2024) highlighted that AI facilitates differentiated learning paths, real-time progress tracking, and adaptive instruction aligned with curricular goals. Shafiee Rad (2025) demonstrated that AI promotes self-regulated learning by supporting goal setting, monitoring, and reflective feedback. Collectively, these insights encourage educators to view AI as a collaborative partner in instructional planning, informing grouping strategies, identifying skill gaps, and supporting adaptive learning. At the institutional level, leaders must provide validated AI platforms and professional development in evidence-based instructional design. Thoughtful integration of AI enhances both efficiency and pedagogical quality, fostering equitable, responsive, and data-driven reading instruction for all learners.

3.2.5. Key benefits teachers' observed from integrating AI into instructional design

Time Efficiency and Reduced Workload

Teachers in this study consistently emphasized that one of the most significant benefits of AI integration is the substantial reduction in preparation time. Participant 1 explained, *"Integrating AI in my instruction helps me prepare materials easily. I can allot saved time for other teaching tasks,"* while Participant 5 added, *"It reduces the time I spend creating worksheets because with just one prompt, it can already provide differentiated activities."* By simplifying the creation of teaching materials and streamlining lesson planning, AI allowed educators to redirect their energy toward direct student support and individualized engagement. Participant 6 described this capability as *"time-saving automation,"* underscoring how efficiency gains enable teachers to maintain instructional rigor while focusing on learner-centered practices. Research confirms that automation reduces workload and enhances instructional efficiency, reinforcing teachers' perceptions of AI as a supportive partner in instructional design (Zhao, 2025).

Empirical evidence corroborates these qualitative insights. Belloula (2025) further confirmed that AI enhances instructional quality while freeing educators to engage in creative, student-centered teaching practices. Collectively, these findings underscore the importance of professional development initiatives that equip teachers with the skills to use AI responsibly and effectively, while ensuring equitable access to validated platforms. By embedding AI strategically, schools can reduce administrative burdens, foster reflective and individualized literacy instruction, and ultimately enhance engagement, fluency, and comprehension across diverse classroom contexts.

Personalization and Differentiated Instruction

Participant 3 observed, *"The key benefits I've observed are time saved in planning, materials that fit my pupils' levels, and more engaging activities."* Participant 7 added, *"AI helps me create reading materials faster, adjust lessons to fit different levels, and give instant feedback."* Similarly, Participant 9 emphasized that AI provides simplified texts for struggling readers, underscoring its adaptability in meeting diverse learner needs. Collectively, these insights reveal that AI enables teachers to personalize instruction by tailoring materials to varying proficiency levels, delivering immediate feedback, and fostering inclusive and equitable learning environments. Holcombe and Wozniak (2024) highlighted that relational AI fosters motivation, while Bandura (1997) emphasized confidence as central to innovation, both of which align with teachers' observations that personalization enhances engagement and builds learner confidence.

These findings are reinforced by existing literature. Professional development initiatives in blended learning increasingly support the creation of leveled texts, vocabulary exercises, and structured worksheets aligned with students' abilities. However, participants stressed that the benefits of AI-driven differentiation depend on strategic integration within structured instructional frameworks. Effective implementation requires educators to analyze AI-generated data, make evidence-based instructional

decisions, and scaffold support tailored to individual learner needs. Consequently, schools must prioritize professional development that equips teachers with competencies in adaptive instruction and data interpretation, while policymakers ensure equitable access to validated AI platforms. By embedding AI thoughtfully, educational stakeholders can foster inclusive, mastery-oriented literacy environments that strengthen confidence, motivation, and sustainable improvements in reading outcomes.

3.3.Teachers' filtration mechanism on the information provided by AI tools and applications in the preparation of foundational reading instruction

3.3.1. Aspects Considered by Teachers in Evaluating AI-Generated Reading Materials

Accuracy and Content Quality

Participant 1 explained, *"When reviewing AI-generated reading materials, I look for the accuracy of the content, appropriateness of the text to the level of the child, clarity of the content, structure, and the educational value."* Participant 6 added, *"The content quality, accuracy, authenticity, relevance, and legitimacy"* are key considerations, while Participants 2 and 9 stressed the importance of scrutinizing AI outputs for reliability, especially in curriculum-specific or nuanced topics. These insights reveal that teachers act as gatekeepers of instructional integrity, ensuring that AI-generated materials are factually correct, pedagogically sound, and aligned with learners' developmental needs. Zhao (2025) similarly emphasized that accuracy is central to teacher readiness.

Empirical evidence reinforces these practices. Huang, Lv, Lu, and Tu (2025) identified accuracy, authenticity, and legitimacy as critical indicators for evaluating AI-generated educational resources, warning that errors or misaligned content can compromise literacy outcomes. Đerić (2025) further highlighted that trust in generative AI depends heavily on perceived accuracy and relevance. These findings suggest that schools must integrate structured evaluation protocols into AI use, such as teacher-developed checklists for accuracy, authenticity, and relevance. Professional development should also strengthen teachers' evaluative skills, enabling them to combine AI's efficiency with human oversight. At the policy level, institutions must establish clear standards for AI adoption, ensuring that content quality is safeguarded while leveraging AI's adaptability. By embedding these safeguards, educators can maintain high instructional standards, foster trust in AI integration, and ensure that foundational literacy instruction remains both rigorous and reliable.

Appropriateness to Learner Level and Curriculum

Participant 3 stated, *"I check if the AI-generated reading materials are accurate, age-appropriate, aligned with my lesson goals and competencies, and with the pupils' reading ability."* Participant 7 added, *"I check if the content matches my pupils' reading levels, is age-appropriate, and fits our curriculum."* Similarly, Participant 5 emphasized adjusting materials for Grade 2 learners to ensure developmental fit. These insights reveal that teachers consistently evaluate AI outputs not only for efficiency but also for appropriateness to learner readiness and curricular coherence. Such practices reflect a deep awareness that AI-generated content must be adapted to support scaffolding, differentiated instruction, and alignment with instructional objectives. Tripathi et al. (2025) likewise emphasized that contextualization and curricular alignment foster meaningful learning, reinforcing the importance of teacher oversight in maintaining instructional integrity.

Research further validates this emphasis. Lee et al. (2024) found that successful AI tools in K–12 classrooms must align with student cognitive levels, curricular frameworks, and instructional design principles. Policy guidance from the U.S. Department of Education (2023) similarly underscores that

AI-infused tools should adapt to learner ability and curriculum standards to promote accessibility and instructional relevance. These findings suggest that educators should not deploy AI-generated materials "as is" but must systematically review and adjust them to ensure text complexity, vocabulary, and tasks align with learner profiles and curricular demands. Schools and districts should provide professional development and frameworks that equip teachers with competencies in adapting AI outputs, while policymakers must ensure equitable access to validated platforms. By embedding AI within structured instructional design, educators can blend efficiency with pedagogical precision, ensuring that literacy instruction remains developmentally appropriate, curriculum-aligned, and inclusive.

Clarity, Structure, and Educational Value

Participant 4 explained, *"I evaluate its relevance, accuracy, and the reading level appropriateness."* Participant 8 added, *"I evaluate the context and appropriateness of it to my learners. I see to it that the material is aligned with the learning objectives."* Similarly, Participant 1 highlighted the necessity of well-structured content, noting that organized materials facilitate easier navigation and comprehension for both teachers and students. These insights reveal that teachers place significant emphasis on clarity, organization, and educational value when reviewing AI-generated reading materials, ensuring that outputs are pedagogically sound, accessible, and aligned with instructional goals. Holcombe and Wozniak (2024) noted that relational and creative AI integration sustains engagement, but teachers emphasized that clarity and structure are indispensable for comprehension and instructional efficacy.

Research substantiates these practices. He (2022) found that well-structured AI materials enhance comprehension, foster independent learning, and support differentiated instruction. Broader evidence from Huang, Lv, Lu, and Tu (2025) stresses the necessity of human review to detect inconsistencies, irrelevant information, or poorly organized content that may undermine learning outcomes. These findings underscore that while AI can generate materials efficiently, its effectiveness depends on teacher oversight. Consequently, schools should implement structured evaluation protocols guiding teachers in assessing clarity, coherence, and instructional value, while professional development programs must equip educators with strategies for refining AI outputs. By combining AI's efficiency with rigorous teacher judgment, literacy instruction can maintain high pedagogical standards, ensuring accessibility, comprehension, and meaningful engagement for all learners.

3.3.2. Teachers' Processes for verifying the Appropriateness and Accuracy of AI- Generated Content

Cross-Checking with Reliable Sources

Participant 1 described a thorough review process that includes evaluating tone, cultural sensitivity, and audience fit, while verifying accuracy by cross-checking with reliable sources. Participant 6 added, *"I cross-check with trusted sources, evaluate context and nuances, and use fact-checking tools."* Similarly, Participants 8 and 9 emphasized comparing AI outputs with established references and curriculum standards. These insights highlight that teachers consistently prioritize verification to ensure factual accuracy, contextual appropriateness, and suitability for classroom use. Such practices reflect their recognition that while AI-generated materials are efficient, they are not infallible and require careful scrutiny to maintain instructional integrity. Nguyen et al. (2024) and Zhao (2025) both affirmed that rigorous validation builds trust in AI integration, positioning teachers as essential gatekeepers of credibility.

Research further substantiates this emphasis. Talaver and Vakaliuk (2025) proposed a structured verification model for AI-generated educational content, involving the identification of factual claims,

evidence gathering from authoritative sources, and revision for accuracy and pedagogical efficacy. Broader frameworks also advocate cross-referencing techniques, metadata analysis, and systematic fact-checking, underscoring verification as both a professional responsibility and a literacy skill. These findings suggest that systematic verification should be embedded into instructional workflows. Schools must provide teachers with access to trusted databases, fact-checking tools, and structured guidelines, while professional development should strengthen evidence-based evaluation skills. By combining AI's efficiency with teacher-led validation, educators can ensure that outputs remain accurate, culturally sensitive, and curriculum-aligned, ultimately safeguarding content quality and enhancing student learning outcomes.

Manual Review and Teacher Judgment

Participant 4 stated, *"Through a careful review. I do not rely fully on AI, I have to filter some of the information to make sure that the content is accurate and aligned with my teaching goals."* Participant 5 added, *"I carefully review the materials or activities generated by AI. I make sure that the words used are appropriate for my Grade 2 pupils and that the content is factual."* Similarly, Participant 3 emphasized examining language use, data accuracy, and instructional fit. These insights reveal that teachers consistently rely on manual review and professional judgment to ensure AI-generated materials are pedagogically sound, developmentally appropriate, and aligned with curricular objectives. Such practices illustrate that AI serves as a supportive tool rather than a substitute for educator expertise, reinforcing the central role of teachers in guiding meaningful learning experiences. Bandura (1997) highlighted the importance of teacher self-efficacy in adopting new tools, a principle evident in the deliberate, hands-on evaluation strategies employed by participants.

Research strongly supports this emphasis on human oversight. Bearman et al. (2024) advocated cultivating evaluative judgment in educators and students alike, enabling them to critically assess generative AI outputs and distinguish high-quality materials from misleading or unsuitable content. Huang, Lv, Lu, and Tu (2025) similarly identified "authenticity," "accuracy," and "legitimacy" as primary indicators for assessing AI-generated educational resources, reinforcing the necessity of teacher-led review to maintain content reliability and pedagogical integrity. In practice, schools should prioritize professional development programs that strengthen teachers' evaluative skills, equipping them with strategies for critical review, content verification, and instructional alignment. Structured review protocols can also be embedded into lesson planning workflows to ensure AI-generated materials are systematically evaluated before classroom use. By combining AI's efficiency with rigorous teacher judgment, educators can safeguard instructional quality while leveraging AI as a powerful complement to their expertise, ensuring foundational literacy instruction remains accurate, appropriate, and pedagogically sound.

Curriculum and Learner Fit

Participant 7 explained, *"I review the AI-generated materials by checking if they match the reading level and age of my pupils. I also compare the content with our curriculum and teaching goals."* Similarly, Participants 2 and 8 emphasized evaluating emotional impact, coherence, and instructional suitability, while Participant 1 highlighted the necessity of aligning AI-generated content with specific learning objectives. These insights reveal that teachers consistently prioritize curriculum alignment and learner fit to ensure instructional relevance and effectiveness. Tripathi et al. (2025) likewise underscored that curricular alignment is essential for meaningful integration, affirming that AI outputs must be adapted to scaffold learning and maintain coherence with instructional frameworks.

Research supports these practices. Lee et al. (2024) found that successful AI tools in K–12 classrooms must align with student cognitive levels, curricular frameworks, and instructional design principles. Policy guidance from the U.S. Department of Education (2023) similarly underscores that AI-infused tools should adapt to learner ability and curriculum standards to promote accessibility and instructional relevance. In practice, educators employ multi-layered verification processes—cross-checking content against reliable sources, manually reviewing language and instructional fit, and adjusting materials to match learner profiles and curricular demands (Talaver & Vakaliuk, 2025; Bearman et al., 2024). These findings suggest that AI is most effective when combined with thoughtful human oversight and professional judgment. Schools and educational leaders should therefore provide structured guidelines and professional development that train teachers to evaluate and adapt AI content systematically. By embedding AI within curriculum-aligned frameworks, educators can enhance engagement, inclusivity, and student-centered learning while safeguarding academic rigor.

3.3.3. Comparing the Usefulness of AI-Generated and Teacher-Created Materials

Speed and Efficiency of AI-Generated Materials

Participant 1 noted, *"AI-generated materials can be a great support… but they still need to be modified because they may lack deeper understanding of learners' needs."* Participant 5 added, *"AI-generated materials are less hassle because with just one prompt, they can already provide ready-to-use activities."* Similarly, Participant 6 described AI as ideal for *"rapid prototyping,"* particularly in dynamic classroom settings that demand flexibility and immediate adaptation. These insights reveal that teachers value AI for its speed and convenience, recognizing its ability to streamline lesson preparation and support responsive teaching practices. However, they also emphasized the necessity of modification to ensure contextual depth, accuracy, and pedagogical relevance. Zhao (2025) observed that automation reduces workload, but teacher-created adjustments safeguard instructional integrity.

Empirical evidence supports these perceptions. Cooley (2024) found that adaptive AI reading tools personalize content in real time and provide immediate feedback, enhancing efficiency while maintaining responsiveness to diverse learner needs. Tripathi, Singh, and Kumar (2025) similarly emphasized that AI improves instructional efficiency while maintaining teacher oversight, underscoring its role as a complement to teacher expertise rather than a replacement. Collectively, these studies demonstrate that AI's speed and adaptability significantly reduce teacher workload without compromising instructional quality. In practice, schools should provide access to adaptive AI platforms and professional development that equips teachers with strategies for integrating AI effectively into literacy instruction. By embedding AI within structured teaching frameworks, educators can optimize classroom time, increase instructional responsiveness, and enhance student engagement. This ensures that AI functions as a powerful adjunct to teacher expertise, accelerating preparation while preserving the depth, accuracy, and pedagogical soundness of foundational reading instruction.

Depth and Contextual Relevance of Teacher - Created Matetrials

Participant 1 described teacher-created resources as *"deeply contextualized,"* while Participants 2 and 6 emphasized their alignment with local contexts and curriculum standards. Participant 5 added that teacher-made content is *"unique"* and often more engaging, even though it requires more time to prepare. These insights highlight that while AI excels in speed and efficiency, teachers value their own materials for their authenticity, cultural relevance, and pedagogical depth. Holcombe and Wozniak (2024) similarly noted that teacher agency ensures cultural and instructional fit, reinforcing the indispensable role of educators in designing meaningful learning experiences.

This perspective is supported by broader frameworks and research. The Philippine Department of Education's *Guidelines on Contextualized Learning Resource Development* emphasize localization, indigenization, and curriculum alignment as essential to instructional design. Dohinog et al. (2025) found that contextualized instructional materials improve comprehension, motivation, and academic performance by connecting content to students' lived experiences. Together, these findings confirm that teacher expertise is vital in producing literacy resources that are not only accurate but also culturally responsive and pedagogically sound. In practice, this means that AI-generated materials should be viewed as supportive tools, while teacher-created resources remain central to ensuring depth, contextual relevance, and authentic engagement in literacy instruction.

Complementary Roles of AI and Teacher-Created Content

Participant 3 summarized this balance by stating, *"AI saves time; teachers add the human touch."* Participants 4 and 7 emphasized that while AI can quickly produce content, teacher-created materials often provide greater accuracy, contextual relevance, and pedagogical soundness. Participants 8 and 9 further noted that AI outputs are largely dependent on the quality of prompts, whereas teacher-developed materials are intrinsically aligned with curriculum standards and tailored to specific learner profiles. Collectively, these insights suggest that AI functions optimally as a supportive tool, while teacher-created resources remain indispensable for depth, authenticity, and contextual fit.

This complementary model is reinforced by literature. The World Economic Forum (2023) highlighted AI-teacher synergy, illustrating how AI can manage data-driven tasks such as content generation, assessment, and feedback, while teachers contribute emotional intelligence, mentorship, and instructional nuance. Rodrigo et al. (2024) similarly emphasized AI's potential to support under-resourced classrooms, enabling teachers to deliver more personalized and effective instruction. In practice, educators reported that AI-generated materials enhance efficiency by reducing preparation time and providing rapid access to resources, allowing teachers to devote more energy to student engagement and individualized support. Yet, they also stressed that AI outputs require careful review and modification to ensure accuracy, relevance, and curricular alignment. Conversely, teacher-created materials offer depth, cultural contextualization, and pedagogical precision, even if their development demands more time.

Together, these findings highlight the importance of leveraging both AI and teacher-generated materials in a complementary manner. Schools and educational leaders should provide professional development opportunities that train educators to integrate AI thoughtfully while continuing to design contextualized resources. Such a strategic partnership maximizes instructional efficiency, promotes personalized learning, and strengthens student-centered literacy practices, ensuring that AI serves as an empowering adjunct to professional judgment rather than a substitute for it.

3.3.4. Student Responses to AI-Generated Content: Engagement and Comprehension Increased Engagement and Motivation

Participant 5 shared, *"My pupils love the activities because they are varied and help remove boredom in class."* Participant 7 added, *"My pupils are more engaged when using AI-generated materials, especially interactive ones. They enjoy the activities and feel more confident."* Similarly, Participant 1 emphasized that after modifying AI-generated reading activities to match students' skill levels, learners showed heightened curiosity and enthusiasm. These accounts reveal that teachers consistently observed AI-generated materials boosting engagement and motivation, particularly when adapted to learners' developmental readiness. This finding resonates with Vygotsky's (1978) constructivist principle that learning becomes meaningful when instruction is tailored to the learner's context. Soni (2025) likewise

found that curiosity flourishes when interactive AI tools are integrated, transforming reading sessions into dynamic experiences that foster enthusiasm and confidence.

Research further substantiates these observations. Chen and Tsai (2021) demonstrated that multimodal and interactive AI-supported materials improve engagement by catering to diverse learning preferences, while Dwivedi et al. (2023) highlighted that AI-driven personalization enhances attentiveness and motivation through adaptive feedback and timely reinforcement. Teachers in this study echoed these findings, noting that AI-generated activities, such as games, quizzes, and visual prompts, stimulated interest, reduced boredom, and promoted sustained participation. Importantly, educators also reported that AI tools supported their own engagement, creating more responsive and stimulating classroom environments. These findings underscore the need for schools to provide professional development that equips teachers with both pedagogical and technical competencies for integrating AI meaningfully. By ensuring equitable access to digital infrastructure and training teachers to design adaptive, interactive, and contextually relevant reading activities, AI can evolve into a powerful tool that nurtures both cognitive and emotional growth, making foundational literacy instruction more personalized, inclusive, and future-ready.

Improved Comprehension Through Personalization

Participant 9 explained, *"Struggling or reluctant readers often feel more confident when AI simplifies texts or provides instant help."* Participant 7 added, *"For comprehension, the personalized content helps them understand better because it matches their reading level."* These accounts highlight that teachers consistently observed AI-supported personalization as a key factor in enhancing comprehension. By tailoring materials to learners' reading levels and cognitive readiness, AI prevents students from feeling overwhelmed and supports effective processing of information. Participant 3 further noted that digital AI platforms increase focus and engagement, which indirectly strengthens comprehension by sustaining motivation. Collectively, these insights underscore that personalization not only facilitates immediate understanding but also supports differentiated instruction, enabling educators to address diverse learner needs within the classroom.

Empirical evidence reinforces these findings. Xue et al. (2025) emphasized that adaptive personalization strengthens literacy outcomes, while Pane et al. (2017) found that technologies adjusting content based on student performance significantly improve comprehension and efficiency. Kulik and Fletcher (2016) similarly highlighted that personalized instruction, whether digital or teacher-facilitated, enhances mastery by providing appropriately challenging material. These studies validate teachers' observations that personalization is pivotal for effective literacy instruction. In practice, educators must actively adapt AI-generated materials to align with learners' profiles, monitor student responses, and adjust scaffolds as needed. Schools and policymakers should support this process by ensuring equitable access to adaptive technologies and offering professional development that equips teachers to leverage AI for personalized instruction. By embedding personalization into instructional practice, AI can foster inclusive, responsive, and motivating reading environments that strengthen comprehension, retention, and long-term literacy growth.

Challenges Due to Limited Exposure and Resources

Participant 2 shared, *"The learners encountered difficulties in responding to the AI-generated content… because they are not very familiar due to limited resources."* This observation highlights the digital divide, where limited access to devices, connectivity, and training constrains learners' ability to engage meaningfully with AI-generated materials. Teachers noted that without consistent exposure, students may

struggle to navigate digital platforms, reducing both engagement and comprehension. These challenges underscore that equitable access and digital literacy scaffolding are prerequisites for effective AI integration in foundational reading instruction. Nguyen et al. (2024) similarly emphasized that equitable access is critical for successful adoption, reinforcing the need for institutional support.

Research aligns with these findings. Van Dijk's (2020) digital divide theory explains that unequal access extends beyond physical resources to include disparities in digital skills and usage opportunities. OECD (2023) likewise stressed that equitable access to digital tools and teacher capacity-building are essential to ensure AI benefits all learners, while UNESCO (2022) highlighted digital literacy as a prerequisite for meaningful engagement with AI-enhanced learning systems. In practice, this means schools must not only provide infrastructure and connectivity but also cultivate digital competence among both teachers and students. Professional development should focus on digital pedagogy and AI literacy, while partnerships with local governments, NGOs, and private sectors can help bridge resource gaps in under-resourced areas. By closing these divides, educators can ensure that AI becomes a tool for inclusion rather than exclusion, empowering all learners to benefit from technology-enhanced literacy instruction.

3.3.5. Teachers modification of AI- generated materials Before Use and Their Strategies Content Simplification and Vocabulary Adjustment

Participant 3 explained, *"I modify AI-generated materials by simplifying difficult words, adjusting the reading level, and adding examples relevant to my pupils."* Participant 7 added, *"I adjust the vocabulary, simplify instructions, and make sure the content fits my pupils' reading level and our curriculum."* Similarly, Participant 6 emphasized breaking complex passages into smaller, digestible segments to prevent learners from becoming overwhelmed. These accounts reveal that teachers frequently adapt AI outputs to ensure developmental appropriateness, readability, and curricular alignment. Such modifications illustrate the indispensable role of professional judgment in transforming AI-generated content into pedagogically effective tools for early literacy growth. Tripathi et al. (2025) highlighted that simplification ensures accessibility for young readers, reinforcing that teacher mediation is essential for meaningful engagement.

Research substantiates these practices. He (2025) demonstrated that adaptive AI texts, when scaffolded and linguistically simplified, enhance comprehension and fluency among beginning readers by aligning textual difficulty with cognitive readiness. Gibbons (2025) similarly emphasized pre-teaching vocabulary and applying readability checks to calibrate AI-generated texts for developmental suitability. These findings confirm that simplification is not a dilution of rigor but a pedagogically sound practice that bridges learners' current abilities with grade-level expectations. In practice, educators must integrate AI tools into structured lesson plans, refining outputs to match learners' linguistic profiles and curricular demands. Schools should support this process by investing in professional development focused on adaptive text design and AI literacy, equipping teachers with skills to evaluate readability, adjust lexical complexity, and scaffold vocabulary instruction. By combining AI's efficiency with teacher expertise, foundational reading instruction can become more inclusive, engaging, and responsive to diverse learner needs.

Contextualization and Relevance to Learners' Backgrounds

Participant 1 shared, *"I make some changes in the content… based on real-life classroom context; more relatable to students."* Participant 2 added, *"I contextualized the text based on my learner's context and needs."* Similarly, Participant 8 emphasized incorporating familiar names and scenarios to strengthen learner connection. These accounts reveal that teachers strategically contextualize AI-generated materials

to ensure that reading instruction reflects learners' lived experiences and cultural realities. Rather than using AI outputs in their raw form, educators actively modify content to embed familiar settings, relatable examples, and developmental appropriateness. This process fosters stronger emotional and cognitive connections, leading to improved engagement and comprehension. Holcombe and Wozniak (2024) emphasized that contextual relevance fosters engagement, underscoring the importance of teacher mediation in making AI outputs resonate with learners.

Research supports this practice. Gibbons (2025) explained that contextualized AI-generated texts enhance motivation by anchoring abstract ideas in familiar experiences. The University of Texas Rio Grande Valley (UTRGV, 2024) teaching framework similarly highlights the need to modify AI prompts and outputs to include authentic and contextually meaningful elements. From a theoretical perspective, these findings echo Vygotsky's (1978) sociocultural theory, which asserts that learning is socially and culturally mediated. When AI-generated materials are contextualized to reflect the learner's environment, they become vehicles for cultural validation and identity affirmation, fostering a sense of belonging and encouraging learners to view reading as both an academic and personal experience.In practice, this means schools should prioritize professional development that equips teachers with skills to adapt AI prompts and outputs to reflect local narratives, linguistic nuances, and cultural diversity. Collaborative efforts among educators can also help curate repositories of contextually adapted AI-generated materials, ensuring inclusivity and relevance across diverse classrooms. Ultimately, contextualization transforms AI from a neutral technological tool into a culturally responsive instructional partner. When learners see their experiences and communities represented in the texts they read, foundational reading instruction becomes more meaningful, equitable, and empowering.

Alignment with Curriculum and Instructional Goals

Participant 9 stated, *"I modify AI-generated materials before using them, and doing so is essential to ensure they meet the needs of my students and align with instructional goals."* Participant 4 similarly explained, *"I have to check whether its content is aligned to my learning goal and if it is appropriate to the needs of my learners."* Participant 7 added that embedding local examples and culturally relevant details strengthens both curriculum alignment and learner connection. These responses highlight that teachers act as evaluators and curators, refining AI outputs to preserve thematic consistency, logical sequencing, and instructional coherence. Their proactive role underscores that AI integration in literacy instruction is most effective when guided by intentional design and professional judgment.

This alignment-oriented approach is supported by the MIT Sloan (2024) practical guide, which recommends embedding clear learning outcomes into AI-assisted lesson planning so that instructional activities, examples, and assessments directly reflect curriculum standards. Gibbons (2025) similarly emphasized that teacher oversight and intentional pedagogical planning are critical in maximizing AI's potential. When educators strategically align AI-generated content with curricular frameworks, they transform AI from a mere productivity aid into a pedagogically grounded teaching resource that upholds educational integrity. In practice, curriculum-aligned AI materials not only safeguard instructional quality but also enhance engagement and comprehension. Simplified passages, adaptive reading tasks, and embedded scaffolds such as vocabulary glossaries and comprehension prompts ensure that learners remain motivated while advancing within their developmental readiness. This intentional alignment confirms that teacher mediation is indispensable in bridging AI efficiency with educational excellence.

3.4. Limitations and challenges that teachers experience in integrating AI tools

3.4.1. Obstacles Teachers Faced when Implementing AI in Foundational Reading

Infrastructural Barriers: Connectivity and Device Access

Participant 1 stated, *"Digital access can also be an obstacle since internet connectivity is unstable in some areas."* Participant 3 added, *"Some obstacles I faced are poor internet access, lack of devices/gadgets for the pupils including the teacher."* These responses highlight how unreliable connectivity and limited device availability disrupt lessons, reduce teaching consistency, and force teachers to prepare time-consuming backup materials. Such interruptions frustrate students, lower engagement, and prevent teachers from fully exploring AI's potential for personalized instruction. Nguyen et al. (2024) emphasized that infrastructure limitations hinder equitable AI adoption, while Zhao (2025) noted that reliable access is critical for consistent integration. These accounts demonstrate that without stable internet and adequate devices, AI tools cannot be maximized, reducing their instructional impact and widening the digital divide. These classroom-level challenges reflect broader issues of digital inequality. Van Dijk's (2020) digital divide theory explains that unequal access extends beyond devices to include disparities in digital skills and usage opportunities. OECD (2023) similarly stressed that equitable access to digital tools and teacher capacity-building are essential to ensure AI integration benefits all learners. Vuong and Phan (2025) further argued that gaps in infrastructure lead to achievement disparities, as students in well-connected schools can access adaptive learning tools while others are left behind. To address these challenges, Garcia and Mendoza (2025) supported a *"connectivity-first"* approach, prioritizing investments in stable internet, updated devices, and responsive technical support. Professional development should also prepare teachers to manage outages and low-tech alternatives to maintain continuity. Ultimately, improving infrastructure is not just a technical issue but a matter of educational fairness. When access is equitable, AI becomes a tool for empowerment rather than exclusion, ensuring that all learners benefit from technology-enhanced literacy instruction.

Content Suitability and Accuracy

Teachers highlighted several obstacles that hinder the effective integration of AI tools in early literacy instruction. Participant 1 shared, *"Digital access can also be an obstacle since internet connectivity is unstable in some areas."* Participant 3 added, *"Some obstacles I faced are poor internet access, lack of devices/gadgets for the pupils including the teacher."* Participant 2 further explained, *"The learners encountered difficulties in responding to the AI-generated content… because they are not very familiar due to limited resources."* These responses reveal that infrastructural barriers such as unstable connectivity, limited device availability, and insufficient exposure disrupt lessons, reduce consistency, and make it difficult for learners to engage meaningfully with AI-generated materials.

Beyond access issues, teachers also expressed concern about the reliability and suitability of AI-generated content. Participant 1 noted, *"Some obstacles… are the accuracy and reliability, AI can also produce errors so there's a need to carefully evaluate the material."* Participant 4 echoed this, stating, *"Lack of gadgets, poor internet connection and the accuracy of its content."* These accounts underscore that teachers must act as vigilant evaluators, refining AI outputs to ensure accuracy, developmental appropriateness, and curricular alignment. Research supports these concerns: Tripathi et al. (2025) found that educators frequently revise AI-generated lesson plans to meet teaching standards, while Talaver and Vakaliuk (2025) introduced verification models to address factual reliability. Collectively, these findings show that obstacles in AI integration are both technical and pedagogical, requiring investments in

infrastructure, equitable access, and teacher training to ensure that AI becomes a supportive tool rather than an additional burden.

Teacher Readiness and Student Dependence

Participant 2 noted, *"Lack of knowledge on how to maximize the use of AI."* Participant 6 added, *"Lack of teachers training and confidence."* These responses highlight that many educators feel unprepared to integrate AI tools effectively, limiting their ability to evaluate outputs and embed them meaningfully into lessons. Bandura (1997) emphasized that teacher self-efficacy is essential for successful technology adoption, and without structured training, teachers may struggle to guide students responsibly. Participant 9 further cautioned, *"Some students may start depending too much on AI-generated answers instead of developing independent reading strategies."* This concern underscores the risk of over-reliance, where learners may bypass the cognitive effort needed for comprehension and critical thinking, treating AI as a shortcut rather than a support tool.

Recent studies reinforce these insights. Dorongon and Sarmiento (2025) found that teacher readiness depends not only on motivation but also on access to training and support, while De Guzman et al. (2024) emphasized the importance of clear guidelines to reduce AI-related anxiety and promote responsible use. These findings suggest that professional development must focus on both technical competence and pedagogical strategies that encourage balanced, student-centered learning. At the same time, educators must establish boundaries to prevent dependency, ensuring AI complements rather than replaces independent literacy development. By building teacher confidence and fostering responsible student use, schools can safeguard educational quality while unlocking AI's potential as a supportive instructional partner.

3.4.2. Impact of Internet Connectivity and Device Availability on AI integration in Reading Instruction

Disruption of Instructional Flow

Participant 1 shared, *"Poor internet connectivity interrupts learning and frustrates both teachers and students."* Participant 9 added, *"Lessons involving AI often get paused or derailed by buffering, failed logins, or tool crashes."* These accounts reveal how technical interruptions break the pacing of lessons, forcing teachers to abandon planned activities or revert to manual methods. Such disruptions fragment learning, weaken comprehension, and lower engagement, particularly in early literacy where continuity is vital. Soni (2025) noted that technical interruptions reduce instructional time and engagement, while Ramirez and Tolentino (2023) and Lee and Cabardo (2024) found that frequent platform issues increase teacher stress and diminish learner focus.

These challenges are compounded by limited backup plans and inflexible AI platforms that restrict teacher control. When systems fail, educators often lack immediate alternatives or technical support, which undermines confidence in AI as a dependable teaching partner. Santiago and Dela Cruz (2022) emphasized that smooth instruction requires both reliable technology and teacher authority, especially in foundational reading where timing and responsiveness are critical. Bautista et al. (2024) further argued that AI must be embedded in strong systems that prioritize continuity and flexibility. Garcia and Mendoza (2025) recommended adaptive platforms, offline capabilities, and teacher-controlled pacing mechanisms to safeguard instructional flow, while Tan and Villareal (2024) highlighted scenario-based training to help educators anticipate and manage disruptions. Collectively, these findings underscore that maintaining instructional flow is not just a technical issue but a pedagogical imperative, requiring resilient

infrastructure, adaptable AI design, and empowered teachers to ensure seamless, learner-centered instruction.

3.4.2. Impact of Connectivity and Device Availability on AI Integration

Limited Integration and Minimal Use

Disruption of instructional flow has become a major challenge in using AI tools for foundational reading instruction. Participant 1 shared, *"Poor internet connectivity interrupts learning and frustrates both teachers and students."* Participant 9 added, *"Lessons involving AI often get paused or derailed by buffering, failed logins, or tool crashes."* These accounts highlight how technical problems such as unstable internet, device malfunctions, and slow interfaces break the pacing of lessons, forcing teachers to abandon planned activities or improvise new materials. Such interruptions fragment learning, weaken comprehension, and lower engagement, particularly in early literacy where continuity is essential. Research confirms that frequent platform issues increase teacher stress and reduce learner focus, disrupting instructional rhythm (Dwivedi et al., 2023; Zhao, 2025).

These challenges are compounded by the absence of backup plans and limited teacher control over AI platforms. When systems fail, educators often lack immediate alternatives or technical support, which undermines confidence in AI as a dependable teaching partner. Santiago and Dela Cruz (2022) emphasized that smooth instruction requires both reliable technology and teacher authority, while Bautista et al. (2024) argued that AI must be embedded in strong systems that prioritize continuity, flexibility, and teacher control. OECD (2023) further stressed that resilient infrastructure and equitable access are prerequisites for effective AI integration. Collectively, these findings underscore that maintaining instructional flow is not just a technical issue but a pedagogical imperative, requiring resilient infrastructure, adaptable AI design, and empowered teachers to ensure seamless, learner-centered instruction.

Limited Integration and Minimal Use

Teachers reported that despite the potential of AI tools, their actual integration into foundational reading instruction remains limited. Participant 2 explained, *"Lack of knowledge on how to maximize the use of AI,"* while Participant 6 added, *"Lack of teachers training and confidence."* These accounts reveal that insufficient preparation and low confidence hinder teachers from fully embedding AI into their lessons. As a result, AI is often used sporadically or only for supplementary tasks rather than as a consistent instructional partner. This minimal use reflects gaps in professional development and institutional support, leaving educators cautious about relying on AI for core literacy instruction.

Research supports these observations. Dorongon and Sarmiento (2025) found that teacher readiness depends on structured training and support, while De Guzman et al. (2024) emphasized the importance of clear guidelines to reduce anxiety and promote responsible use. Bandura's (1997) theory of self-efficacy further explains that confidence and perceived competence are critical for successful technology adoption. Without these supports, teachers struggle to evaluate AI outputs, adapt them to curriculum goals, and integrate them meaningfully into lessons. Consequently, AI remains underutilized, with its potential for personalization and engagement often unrealized. Addressing this challenge requires targeted professional development, clear integration frameworks, and confidence-building initiatives so that teachers can move beyond minimal use and harness AI as a transformative tool in foundational reading instruction.

3.4.3. Ethical Concerns Teachers Consider when using AI tools with young learners

Ethical Concerns: Data Privacy and Security

Participant 2 acknowledged, *"Lack of knowledge on how to maximize the use of AI,"* while Participant 6 emphasized, *"Lack of teachers training and confidence."* These responses highlight that teacher readiness

is not only technical but also ethical, requiring confidence and structured guidance to ensure AI is used responsibly. Participant 9 cautioned, *"Some students may start depending too much on AI-generated answers instead of developing independent reading strategies,"* underscoring the risk of over-reliance. These accounts reveal that teachers play a critical role as ethical overseers, ensuring that AI remains a supportive tool rather than a shortcut that undermines independent literacy development. Bandura (1997) stressed that teacher self-efficacy is essential for effective technology adoption, reinforcing the need for professional development that builds both competence and confidence.

Recent studies echo these concerns. Dorongon and Sarmiento (2025) found that teacher readiness depends on structured training programs that address not only technical skills but also ethical usage and pedagogical integration. De Guzman et al. (2024) emphasized the importance of clear guidelines to reduce anxiety and prevent misuse, while UNESCO (2022) and OECD (2023) have warned that uneven AI deployment could exacerbate inequalities if not guided by ethical frameworks. These findings suggest that teachers must act as mediators, balancing innovation with responsibility, and guiding students toward thoughtful, independent engagement with AI-generated materials. By institutionalizing training, ethical oversight, and clear classroom policies, schools can ensure that AI integration strengthens literacy instruction while safeguarding educational integrity.

Age-Appropriateness and Emotional Safety

Ensuring that AI-generated content is suitable for children's developmental stage and emotionally safe is a major concern for educators. Participant 2 explained, *"Young learners need to build social skills through face-to-face interaction… to develop emotional intelligence."* Participant 8 added, *"It should provide positive learning experiences not anxiety or frustration."* These reflections highlight that AI must complement, not replace, human interaction in early literacy instruction. Teachers stressed the importance of evaluating AI platforms for cultural sensitivity, emotional impact, and age-appropriateness to prevent overstimulation, frustration, or disengagement. Alexandrowicz (2024) reinforced this perspective, noting that affective investment is central to meaningful adoption of educational technologies.

Research further supports the need for emotionally safe and developmentally appropriate AI tools. Dwivedi et al. (2023) found that personalization and adaptive feedback in AI systems can enhance engagement but must be carefully moderated to avoid cognitive overload. Holcombe and Wozniak (2024) emphasized that contextual relevance and relational creativity foster positive emotional connections between learners and digital tools. Livingstone and Third (2017) highlighted that children's rights and digital safety must be safeguarded in educational technologies, ensuring that platforms respect developmental boundaries. UNESCO (2022) similarly stressed that digital learning systems must prioritize well-being, while OECD (2023) underscored the importance of age-appropriate design and teacher oversight in AI integration. Collectively, these findings confirm that emotional safety and age-appropriateness are essential standards for responsible AI use in early education, ensuring that technology enhances both learning outcomes and children's well-being.

Teacher Guidance and Ethical Oversight

Teachers consistently emphasized that ethical use of AI in early literacy classrooms requires active supervision and human connection. Participant 9 cautioned, *"Some students may start depending too much on AI-generated answers instead of developing independent reading strategies."* Participant 6 added, *"Lack of teachers training and confidence,"* underscoring the need for structured preparation to ensure responsible integration. These reflections show that educators see themselves not only as facilitators but as ethical protectors, monitoring AI use, filtering content, and maintaining a caring learning environment.

Importantly, they agreed that AI should never replace face-to-face interaction, especially in foundational education where emotional intelligence and personal relationships are crucial.

This perspective is reinforced by established ethical frameworks. The European Commission's Ethics Guidelines for Trustworthy AI (2023) stress the importance of human oversight, transparency, and learner safety in AI deployment. UNESCO (2022) similarly highlighted that digital education must be guided by ethical principles to protect children's rights and well-being. OECD (2023) emphasized that equitable access and teacher involvement are essential to ensure AI strengthens rather than undermines instructional quality. Finally, Bandura's (1997) theory of self-efficacy explains that teacher confidence and competence are critical for responsible adoption of new technologies. Collectively, these insights affirm that ethical oversight is not just a technical concern but a pedagogical imperative, requiring clear institutional safeguards, parental consent processes, and ongoing teacher training to ensure AI strengthens literacy instruction while protecting young learners.

3.4.4. Misconceptions and Fears About AI Among Teachers and Stakeholders

Fear of Teacher Replacement and Misconceptions

Some educators feared AI might replace teachers. Participant 5 noted, *"One common misconception about AI is that it will eventually replace teachers, which creates fear among educators."* Participant 9 added, *"AI will take over teaching jobs, making teachers obsolete."* Tripathi et al. (2025) emphasized that AI should be viewed as supportive rather than substitutive, highlighting its role in assisting rather than replacing human expertise. These responses imply the need for clear orientation and policy communication to reassure teachers that AI is a complement to their work, not a threat to their profession. Other teachers misunderstood AI's capabilities, with some finding it too complex or believing it could *"teach anything."* Participant concerns included fears that excessive reliance *"kills creativity and critical thinking"* and leads to student laziness. Dwivedi et al. (2023) found that perceived complexity and lack of clarity hinder adoption, while UNESCO (2022) stressed that ethical frameworks are needed to prevent misuse and dependency. OECD (2023) similarly highlighted that teacher involvement is essential to ensure AI enhances creativity and resilience rather than diminishing them. Collectively, these findings imply that institutions must invest in contextual training, mentoring, and ethical oversight to build teacher confidence, safeguard student independence, and ensure AI strengthens rather than undermines literacy instruction.

Concerns About Student Dependency and Creativity Loss

Teachers expressed apprehension that excessive reliance on AI could hinder creativity and weaken critical thinking among learners. Participant 8 cautioned, *"Overdependence kills creativity and critical thinking skills,"* while Participant 2 similarly warned, *"Learners will be too dependent on AI, which will reduce the development of their critical thinking."* These reflections reveal a shared concern that while AI provides efficiency and support, it may inadvertently foster passivity and dependency if not carefully monitored. Such insights align with Bandura's (1997) principle of scaffolding, which emphasizes the gradual withdrawal of support to sustain independent learning, underscoring the need for intentional teacher guidance to preserve creativity and problem-solving skills.

Recent scholarship reinforces these concerns. Dwivedi et al. (2023) observed that perceived complexity and lack of clarity in AI systems can hinder adoption and risk fostering dependency if not paired with teacher oversight. Tripathi et al. (2025) highlighted that AI should be positioned as a supportive tool for skill development rather than a substitute for independent thinking. Zhang et al. (2024) found that students with lower academic self-confidence were more likely to rely heavily on AI, correlating with weaker

problem-solving abilities. UNESCO (2022) and OECD (2023) further warned that without ethical frameworks and teacher involvement, AI integration may inadvertently undermine creativity and learner autonomy. Collectively, these insights highlight the importance of ethical oversight and purposeful pedagogy, ensuring that AI enhances learning while safeguarding creativity, independence, and holistic child development.

3. 4.5. Resolving Problems When AI Tools Do Not Align with Teaching Goals

Refining and Modifying AI Outputs

Educators reported that when AI-generated materials did not align with their instructional objectives, they actively refined and modified the outputs to ensure pedagogical relevance. Participant 1 explained, *"When AI tools don't align with my teaching goals I will refine, and filter AI content so it works for the lesson,"* while Participant 7 added, *"When AI tools don't match my teaching goals, I revise the content to fit my objectives."* These reflections highlight the teacher's central role in adapting AI outputs, treating them not as finished products but as flexible resources requiring contextualization, simplification, or supplementation. Such practices demonstrate that teachers remain the primary agents of instructional design, ensuring that AI serves as a supportive tool rather than a prescriptive authority.

Recent scholarship reinforces this teacher-led refinement process. Mollick and Mollick (2024) emphasized that educators must use evidence-based strategies, such as varied examples and formative assessments, while customizing AI outputs to fit instructional goals. The MIT Sloan Teaching Guide (2024) similarly recommended reviewing and modifying AI-generated content to match learner profiles and teaching methods. UNESCO (2022) highlighted that ethical and pedagogical oversight is essential to prevent misuse, while OECD (2023) stressed that teacher involvement ensures AI integration remains equitable and developmentally appropriate. Collectively, these findings imply that effective AI integration requires professional development that builds teachers' confidence in critically assessing and adapting AI outputs, alongside institutional policies that recognize refinement as an ethical necessity. Ultimately, AI should be viewed as a collaborative partner that supports, but never replaces, the teacher's expertise in creating meaningful and developmentally appropriate learning experiences.

Reverting to Lesson Objectives and Curriculum Standards

Teachers emphasized that when AI-generated outputs did not align with their instructional needs, they deliberately returned to lesson objectives and curriculum standards as guiding anchors. Participant 4 explained, *"I go back to my lesson objectives and check if the AI activity supports them. If not, I change or skip them."* Another teacher shared, *"I go back to lesson objectives to check if the AI-generated materials really support the learning goals."* Others agreed, highlighting the importance of revisiting instructional aims to spot and fix mismatches, with one educator noting that *"AI is only used when it genuinely helps achieve the objectives I have set for the day."* These reflections reveal a teacher-led approach where curriculum coherence and pedagogical integrity remain central, ensuring that technology supplements rather than dictates instructional design.

This practice is consistent with recent frameworks advocating goal-focused AI integration. Filiz et al. (2025) emphasized that curricular alignment is essential for instructional coherence, while the MIT Sloan Teaching Guide (2024) recommended beginning with clear learning goals and curriculum references before employing AI tools, showing how teachers can upload syllabi and standards to keep AI-generated lesson plans relevant and effective. Structural Learning (2024) similarly described AI as a "thinking partner" that can assist with curriculum mapping and formative assessment design, but only when directed by teacher judgment. UNESCO (2022) and OECD (2023) further reinforced that effective AI integration

must be guided by curriculum standards and teacher oversight to ensure developmental appropriateness and learner-centered outcomes. Collectively, these findings imply that professional development should strengthen teachers' ability to critically assess AI outputs against curriculum standards, alongside institutional support that encourages reflective practice. Ultimately, AI should be positioned as a collaborative partner that reinforces the teacher's vision, ensuring instructional coherence and pedagogical integrity.

Evaluating AI Tools and Gathering Feedback

Teachers emphasized the importance of critically evaluating AI tools and gathering student feedback to ensure instructional alignment. Participant 6 explained, *"I reassess the teaching goals, gather feedback from pupils, and evaluate the AI tools' design and purpose."* Similarly, Participant 3 shared, *"I resolve problems by reviewing the AI output and modifying it so it aligns with my lesson objectives."* These responses highlight a reflective and teacher-led approach, where educators do not rely on technology uncritically but instead reassess objectives, filter outputs, and incorporate learner perspectives to maintain pedagogical integrity. Teachers also noted that rigid platforms were treated as references rather than primary sources, emphasizing the need for clear prompts and awareness of AI's limitations.

This evaluative practice is supported by recent frameworks that stress teacher involvement in AI integration. Tripathi et al. (2025) emphasized that reflective practice strengthens AI adoption, while the AI Literacy Framework from Digital Promise (2023) advises educators to assess tools for transparency, flexibility, and alignment with learning outcomes. Buckingham Shum et al. (2023) further underscored the importance of enabling educators to provide feedback when using automated systems, ensuring that adjustments remain student-centered. UNESCO (2022) and OECD (2023) also highlight that teacher oversight and ethical evaluation are essential to safeguard instructional quality. Collectively, these findings imply that successful AI integration depends on empowering teachers as primary decision-makers. Professional development should therefore build teachers' confidence in evaluating AI outputs, while institutional policies must ensure that platforms remain transparent, adaptable, and aligned with curriculum standards. Ultimately, this teacher-centered approach safeguards pedagogical quality while enabling AI to serve, rather than dictate, the direction of foundational reading instruction.

3.5.Professional Development Program to Support Foundational Reading Teachers in Effectively Integrating AI

3.5.1. Training Topics Needed for Effective AI Use in Reading Instruction

Technical Foundation and Tool Familiarization

Teachers emphasized the need for foundational knowledge and practical training on AI to confidently integrate it into literacy instruction. Participant 2 suggested topics such as *"AI Fundamentals"* and *"AI Tools Used for Reading Instruction,"* while Participant 9 underscored the importance of understanding *"what AI is and how it works."* Participant 3 added, *"I need guidance on how to choose the right AI tools and most importantly how to navigate and use them."* These responses highlight that educators want clarity on both the conceptual and practical aspects of AI, including its functions, limitations, and classroom applications. Such reflections reveal that building confidence among teachers, especially those with limited technological experience, requires structured training that simplifies AI concepts and provides hands-on guidance for tool selection and use.

Recent scholarship supports this teacher-led call for technical orientation. Tripathi et al. (2025) emphasized that foundational training builds confidence and readiness, while Zhao (2025) noted that tool

familiarization is essential for effective integration. Global initiatives such as Google's AI Literacy Program (2023–2024) offer accessible courses like *Generative AI for Educators* and *AI Essentials,* which introduce key concepts and provide practice with tools such as Gemini and NotebookLM. UNESCO (2022) stressed that professional development must include ethical and pedagogical dimensions, while OECD (2023) highlighted the importance of equipping teachers with both technical and evaluative skills to ensure equitable AI adoption. Collectively, these findings imply that professional development programs must prioritize AI fundamentals, tool navigation, and ethical use, empowering teachers to select, evaluate, and apply AI meaningfully in literacy instruction. Ultimately, integrating AI into education should begin with equipping teachers with confidence, competence, and care, ensuring that technology enhances rather than replaces pedagogical expertise.

Instructional Design and Integration Strategies

Teachers stressed the importance of practical strategies for integrating AI into instructional design. Participant 1 shared, *"I will look forward for training topics like prompting, curriculum alignment, content evaluation, integration strategies, engagement, ethics, and troubleshooting."* Participant 6 added, *"Personalizing reading instruction with AI, enhancing fluency and comprehension, integrating AI with pedagogical strategies, and supporting diverse learners."* These responses highlight a shift from general awareness of AI tools to a stronger demand for specialized training that connects technology with pedagogy. Educators emphasized that AI should support instructional goals, such as differentiated instruction, formative assessment, and student engagement, rather than distract from them. Their reflections underscore the need for professional development that bridges technical skills with pedagogical application, ensuring AI enhances literacy instruction while maintaining coherence with curriculum standards.

Recent literature affirms this teacher-led demand for integration strategies. Filiz et al. (2025) emphasized that curriculum alignment ensures instructional coherence, while Ruslim and Khalid (2024) found that teachers often struggle to convert AI capabilities into adaptive learning experiences, pointing to the need for training in prompt engineering and differentiated content design. Real-world examples, such as Khan Academy's *Khanmigo*, demonstrate how AI can scaffold reading tasks and produce leveled grammar exercises, but only when guided by teacher expertise. UNESCO (2022) and OECD (2023) further stressed that integration must be grounded in pedagogical frameworks and ethical oversight. Collectively, these findings imply that professional development must go beyond tool familiarization to include instructional design, adaptive strategies, and reflective practice. Ultimately, framing AI integration as a teaching skill reinforces the teacher's unique role in creating meaningful, human-centered learning, ensuring that confidence, competence, and care guide every step of the digital classroom.

Ethics, Safety, and Learner-Centered Use

Teachers emphasized that ethical and learner-centered considerations must be embedded in AI training and practice. Participant 1 noted, *"Training should include ethics and troubleshooting,"* while Participant 7 explained, *"To use AI more effectively, I would benefit from training on creating AI-generated reading materials tailored to different levels, using AI for reading assessment and feedback, and integrating AI into daily lesson plans."* These reflections show that educators are not only concerned with technical proficiency but also with ensuring that AI use remains age-appropriate, culturally sensitive, and emotionally safe for learners. Teachers highlighted the importance of balancing personalization with protective measures, recognizing that AI tools must support development without causing dependency, anxiety, or disengagement.

Recent scholarship reinforces this ethical viewpoint. Alexandrowicz (2024) stressed that ethical oversight fosters trust in AI adoption, while UNESCO (2022) highlighted that digital education must be guided by principles that protect children's rights and well-being. OECD (2023) emphasized that equitable access and teacher involvement are essential to ensure AI strengthens rather than undermines instructional quality. Zhao (2025) further argued that embedding AI literacy into curriculum models promotes responsible use and digital citizenship, ensuring learners develop critical awareness alongside technical skills. Collectively, these findings imply that professional development must prioritize ethics, safety, and learner-centered practices alongside technical training. Localized modules that reflect classroom realities, including language diversity and cultural contexts, ensure that training remains relevant and inclusive. Ultimately, responsible AI integration begins with empowering teachers to critically assess platforms, ensuring that confidence, competence, and care guide every decision in the digital classroom.

Tiered and Differentiated Training Models

Teachers recommended tiered approaches to professional development that accommodate varying skill levels and readiness for AI integration. Participant 1 suggested, *"Professional development should be tiered (beginner to advanced), hands-on, scaffolded, and supported over time."* Participant 5 added, *"For beginners, sessions can focus on basics… for more tech-savvy teachers, training can explore innovative applications and mentoring."* These reflections highlight the importance of inclusivity and scaffolding, ensuring that teachers at different stages of technological confidence can progressively build competence. By viewing AI training as a continuous process rather than a one-size-fits-all approach, educators emphasized the need for pacing, personalization, and mentorship to sustain growth.

Recent scholarship supports this differentiated model. Bandura (1997) emphasized scaffolding as key to building confidence, while Ruslim and Khalid (2024) found that although many teachers feel generally confident using AI, they often lack deeper understanding needed for effective application in diverse instruction. Their study recommends structured pathways beginning with foundational knowledge, such as AI literacy, ethical use, and tool familiarization, and gradually advancing to complex applications like adaptive content creation, formative assessment design, and blended learning strategies. UNESCO (2022) and OECD (2023) further reinforced that professional development must be modular and inclusive, ensuring equitable access and progression routes. Collectively, these findings imply that professional development must adopt tiered formats, workshops, coaching, and online modules, that respect teachers' starting points and provide clear progression. Ultimately, tiered training reduces anxiety, fosters curiosity, and empowers educators to integrate AI ethically and effectively, ensuring that confidence, competence, and care guide every step of instructional innovation.

Needs Assessment and Skill Mapping

Teachers highlighted the importance of assessing existing skills before structuring professional development in AI integration. Participant 2 suggested, *"The professional development must be structured to accommodate varying teachers' needs by assessing current skills."* Participant 9 simply stated, *"Conduct a needs assessment."* These reflections emphasize that training should begin with diagnostic evaluation of teacher readiness, confidence, and instructional context. By mapping competencies, educators can engage with content that is relevant to their experience and goals, ensuring inclusivity and responsiveness. This approach avoids redundancy, reduces frustration, and creates meaningful learning experiences tailored to individual growth paths.

Recent frameworks reinforce the value of skill mapping in professional development. Filiz et al. (2025) noted that mapping competencies ensures relevance and engagement, while the SFIA AI Skills Framework

provides level-based descriptions that help educators identify their current abilities and select suitable training modules. Ruslim and Khalid (2024) further emphasized that structured pathways beginning with foundational knowledge, such as AI literacy, ethical use, and tool familiarization, should gradually advance to complex applications like adaptive content creation and blended learning strategies. Garcia and Lim (2025) argued that when training is personalized and structured, teachers are more likely to integrate AI responsibly and creatively. These findings imply that institutions must prioritize pre-training evaluations, modular formats, and reflective practice to maximize impact and long-term adoption of AI tools. Ultimately, needs-based training empowers educators to progress at their own pace while safeguarding pedagogical integrity, ensuring that confidence, competence, and care guide every step of AI integration in foundational education.

Hands-On Practice and Peer Support

Teachers regularly highlighted the importance of experiential learning and collaboration in AI training. Participant 3 explained, *"Professional development should be structured to accommodate different skill levels… more hands-on practice and technical support are necessary."* Participant 7 added, *"Hands-on workshops, peer mentoring, and follow-up support should be included to help all teachers grow at their own pace."* These reflections show that practical application and peer collaboration help educators move beyond theory, experiment with AI tools, and build confidence in real classroom contexts.

Recent scholarship reinforces these insights. Soni (2025) confirmed that collaborative practice fosters confidence in technology use, while UNESCO (2022) emphasized that experiential and community-based approaches are essential for ethical and effective digital learning. OECD (2023) similarly highlighted that peer mentoring and collaborative training reduce anxiety and build shared responsibility in AI adoption. Real-world initiatives, such as Digital Promise's *AI Literacy Framework* (2023), demonstrate how immersive workshops, peer mentoring, and real-time feedback strengthen both technical skills and ethical awareness. Collectively, these findings suggest that institutions should invest in immersive, varied, and ethically grounded training that blends hands-on practice with peer support, ensuring AI integration is sustainable, equitable, and transformative for both teachers and students.

3.5.3. Preferred Formats for AI Training

Hands-On Workshops for Practical Learning

Workshops were consistently valued by teachers as the most effective way to build confidence in using AI. Participant 3 noted, *"Hands-on workshop and peer coaching would be most helpful for learning AI integration especially for the not so tech-savvy."* Participant 8 added, *"Workshops facilitated by experts."* These responses highlight the importance of guided practice, live demonstrations, and immediate feedback. Zhao (2025) emphasized that immersive training builds competence, while UNESCO (2022) stressed that experiential and community-based approaches are essential for ethical and effective digital learning. OECD (2023) similarly highlighted that peer mentoring and collaborative training reduce anxiety and build shared responsibility in AI adoption.

The implications point toward professional development that is thoughtful, personalized, and collaborative. Tiered and differentiated training models should accommodate varying levels of AI expertise, beginning with foundational concepts and gradually advancing to adaptive content creation and assessment design. Ruslim and Khalid (2024) found that teachers often struggle to convert AI capabilities into adaptive learning experiences, pointing to the need for structured pathways and contextual training. Collectively, these findings suggest that institutions must invest in immersive, community-oriented

workshops that blend practical experience with ethical and pedagogical guidance, ensuring AI integration is sustainable, equitable, and transformative for both teachers and students.

Peer Coaching and Mentoring

Peer coaching emerged as an essential format for AI integration. Participant 1 stated, *"The most effective approach combines hands-on workshops, peer coaching, and continuous practice."* Participant 7 added, *"Peer coaching helps build confidence through shared experiences and support."* These responses highlight that mentoring fosters trust, relevance, and ongoing learning, making AI integration more accessible. Recent scholarship reinforces this emphasis on collaborative mentoring. Darling-Hammond et al. (2023) demonstrated that peer-led professional development improves teacher effectiveness, particularly with complex innovations such as AI. UNESCO (2022) stressed that community-based and collaborative approaches are vital for ethical and inclusive digital education. OECD (2023) similarly highlighted that peer mentoring reduces isolation, builds shared responsibility, and strengthens teacher agency in technology adoption. Zhao (2025) further argued that embedding AI literacy into professional development requires scaffolding and peer support to ensure responsible use.The implications are clear: peer coaching strengthens technical skills while nurturing shared leadership, reflective practice, and ethical awareness. Schools should embed peer coaching into professional development frameworks, ensuring AI integration is collaborative, context-sensitive, and rooted in community support. This approach fosters sustainable, inclusive, and responsible teaching practices, empowering educators to integrate AI with confidence, competence, and care.

Webinars and Flexible Learning Options

Teachers valued webinars for their flexibility and accessibility. Participant 7 explained, *"Workshops are great for hands-on practice… webinars offer flexible learning and expert insights."* Participant 9 added, *"Workshops and webinars."* These responses show that webinars provide expert knowledge while allowing teachers to learn at their own pace, making them ideal for busy schedules and diverse learning styles.

Recent scholarship supports this flexible model. Tripathi et al. (2025) emphasized that multimodal formats increase accessibility and inclusivity, while ISTE (2024) highlighted that blended professional development, combining synchronous webinars with asynchronous modules, improves engagement, retention, and ethical reflection. UNESCO (2022) further stressed that flexible learning pathways are essential for equitable digital education, and OECD (2023) reinforced that diverse training formats empower teachers to adapt AI responsibly across varied contexts. The implications highlight the importance of multimodal professional development that integrates workshops, peer coaching, and webinars. Workshops build confidence through guided practice, peer mentoring fosters trust and shared leadership, and webinars extend access to expert insights across varied contexts. Collectively, these findings suggest that institutions should invest in flexible, inclusive, and community-oriented training systems that respect teacher diversity, encourage collaboration, and build long-term capacity for responsible AI integration in foundational literacy instruction.

3.5.4. Sustaining Reflection and Continuous Improvement in AI Integration

Cyclical Learning and Reflective Practice

Teachers emphasized the importance of iterative and ongoing learning structures. Participant 1 stated, *"A Professional Development program can support continuous reflection and improvement by designing a series of workshops plus follow-ups."* Participant 7 added, *"Regular check-ins, reflection journals, and peer sharing sessions help us stay current and improve."* These responses highlight that professional

development must move beyond one-off sessions toward cyclical formats that include learning, application, reflection, and continuous improvement.

Recent scholarship reinforces this emphasis. Alexandrowicz (2024) stressed that reflective practice is central to sustained growth, while Knight (2017) argued that reflective cycles strengthen teacher agency and instructional clarity. Phillips et al. (2023) found that journaling and peer dialogue enhance instructional responsiveness, while UNESCO (2022) emphasized that continuous reflection is essential for ethical and inclusive digital education. OECD (2023) similarly highlighted that adaptive and cyclical formats build long-term teacher capacity for responsible AI integration.

The implications suggest that schools should design professional development programs that embed reflection, collaboration, and adaptive learning into every stage of AI integration. Modular formats, follow-up sessions, and collaborative spaces such as coaching circles encourage ongoing reflection and shared best practices. By embedding cyclical learning into training, educators are more likely to use AI ethically, adaptively, and effectively, ensuring integration is sustainable, inclusive, and aligned with both pedagogical goals and student needs.

Collaborative Learning and Peer Support

Collaboration was consistently seen as vital for effective AI integration. Participant 2 explained, *"The Professional Development program supports continuous reflection and improvement in AI use through regular feedback and collaborative sessions."* Participant 9 added, "Create forums, discussion groups, or regular meetups where teachers share experiences and strategies." These responses highlight that collaboration builds confidence, fosters transparency, and creates safe spaces for sharing strategies. Soni (2025) noted that communities of practice foster innovation, while Darling-Hammond et al. (2023) and Vinutha HM (2025) confirmed that peer-led learning enhances teacher agency, ethical decision-making, and instructional quality.

The implications suggest that professional development must embed collaboration as a core element, moving beyond isolated training toward community-based growth. Structured peer networks, such as learning communities, mentoring systems, and coaching circles, encourage teachers to co-design, critique, and refine AI-assisted practices. Springer (2024) and Phillips et al. (2023) found that collaborative environments increase teacher agency, resilience, and ethical reflection, ensuring AI use remains student-centered and contextually relevant. Moving forward, institutions should invest in consistent, flexible, and collaborative formats, forums, peer mentoring, and reflective groups, that empower teachers to integrate AI responsibly while strengthening collective capacity and sustaining innovation in literacy instruction.

3.5.5. Professional Growth Through AI-Focused Development

Skill Development and Instructional Enhancement

Teachers expressed a strong desire for practical skills that directly improve instructional quality and student engagement. Participant 1 shared, *"I hope I can learn how to use AI to create engaging reading materials… gain strategies for differentiated instruction… and guide students in using AI responsibly."* Participant 5 added, *"I hope to gain new skills in using AI tools effectively, improve my teaching strategies, save time in lesson preparation, and better support my students' learning needs."* These reflections highlight that educators view AI-focused professional development as a pathway for both classroom impact and professional growth.

Recent scholarship supports this teacher-led call for skill development. Tripathi et al. (2025) emphasized that skill development enhances instructional quality, while Ruslim and Khalid (2024) noted that experiential learning builds confidence and aligns with curriculum goals. Phillips et al. (2023) found that

AI-supported training increases instructional responsiveness and reflective practice, while UNESCO (2022) stressed that embedding ethical awareness into training ensures outputs remain age-appropriate and culturally relevant. OECD (2023) further reinforced that professional development must integrate adaptive strategies to support diverse learners. Collectively, these findings position AI-focused professional development as both a resource for instructional innovation and a driver of career advancement. By equipping teachers with practical, adaptive skills, institutions can ensure educators are prepared to lead inclusive, future-ready instruction that enhances literacy outcomes and supports long-term student success.

Confidence and Responsible Use of AI

Building confidence in using AI tools has become a central aspiration for educators seeking to improve classroom practices and student outcomes. Participant 7 stated, *"By joining an AI-focused development program, I hope to gain confidence in using AI tools, improve my skills in creating personalized reading materials, and stay updated with new teaching strategies."* Participant 9 added, *"Learn how different AI tools work and how to select those best suited for reading instruction."* These reflections highlight a proactive shift from simply using AI tools to intentionally integrating them with developmental goals and student needs.

Bandura (1997) emphasized that confidence is essential for innovation, while Ruslim and Khalid (2024) noted that confidence grows when educators combine technical skills with clear teaching methods. Phillips et al. (2023) found that when teachers learn to evaluate and adjust AI outputs, they are more likely to use them creatively and ethically. UNESCO (2022) reinforced that ethical reflection must be embedded in digital education, ensuring outputs remain age-appropriate and culturally relevant. OECD (2023) similarly stressed that professional development should integrate both technical competence and ethical awareness to empower teachers as responsible decision-makers.

The implications suggest that professional development must empower teachers not only with technical competence but also with ethical awareness and reflective practices. By embedding modules on data privacy, bias awareness, and instructional design, training frameworks ensure that teachers critically assess AI tools and guide students toward responsible use. Moving forward, schools should prioritize training that builds confidence, nurtures digital literacy, and reinforces teaching integrity, positioning AI as a supportive partner that enhances instruction while keeping human values at the core of learning.

Motivation, Innovation, and Student Engagement

Teachers expressed strong interest in using AI to sustain student motivation and foster innovation in literacy instruction. Participant 1 explained, *"I hope I can learn how to use AI to create engaging reading materials… discover new ways to keep students motivated with interactive and personalized AI content."* Participant 8 added, *"I am hoping to learn more about AI."* These reflections highlight a proactive mindset where educators see AI not just as a tool but as a pathway to transform classroom dynamics. Recent scholarship supports this perspective. Ruslim and Khalid (2024) found that experiential training in prompt design and instructional alignment builds confidence and ensures effective use of AI. Zhao (2025) emphasized that embedding AI literacy into professional development fosters innovation while maintaining ethical awareness. Phillips et al. (2023) demonstrated that AI-supported training enhances instructional responsiveness and reflective practice, while UNESCO (2022) stressed that digital education must remain student-centered and culturally relevant. OECD (2023) similarly reinforced that adaptive and interactive AI tools can strengthen engagement when guided by teacher expertise.

The evidences highlights that professional development must focus on equipping teachers with practical skills to design interactive, personalized, and age-appropriate AI-supported materials. By embedding modules on data privacy, bias awareness, and instructional design, training ensures that teachers critically assess AI outputs and guide students toward responsible use. Ultimately, educators' enthusiasm for innovation and engagement points to a broader willingness to reshape classrooms into dynamic, student-centered environments. By blending creativity, ethical reflection, and technical skill-building, schools can ensure AI integration enhances motivation, fosters innovation, and strengthens literacy outcomes in foundational education.

Theoretical Implications

Technological Pedagogical Content Knowledge (TPACK) The findings highlight teachers' need to integrate AI with pedagogical and content expertise, not just technical skills. Mishra and Koehler's (2006) TPACK framework underscores that effective technology use occurs at the intersection of technological, pedagogical, and content knowledge. Teachers' requests for prompting techniques, curriculum alignment, and differentiated instruction reflect the importance of building TPACK skills. Professional development must therefore emphasize hands-on practice and modular training to ensure AI supports instructional coherence and literacy outcomes.

Sociotechnical System Theory (STS) Trist and Emery's (1973) STS framework emphasizes balancing social and technical systems. Teachers in this study stressed ethical oversight, peer mentoring, and collaborative learning, warning against over-reliance on AI. This aligns with Berson et al. (2025), who caution that AI must remain developmentally appropriate and culturally inclusive. Professional development should therefore cultivate both technical competence and social practices, ensuring AI enhances rather than disrupts teaching relationships.

Sociocultural Theory Grounded in Vygotsky (1978), sociocultural theory views learning as socially mediated. Teachers valued emotional engagement, scaffolding, and dialogue in literacy instruction, noting that AI must be integrated into socially rich, teacher-led environments. Gibbons (2025) similarly emphasized tailoring AI to linguistic and cognitive contexts. Professional development should thus promote collaborative inquiry, peer mentoring, and culturally relevant design, positioning AI as a supportive mediating tool.

Technology Acceptance Model (TAM) Davis's (1989) TAM highlights perceived usefulness and ease of use as drivers of adoption. Teachers sought confidence, relevance, and clear instructional benefits, echoing Venkatesh and Bala's (2008) TAM2 expansion. Hangargekar (2024) found adaptive AI tools increase teacher engagement by reducing workload. Training must therefore build confidence through practical workshops and peer support, showcasing AI's instructional value to foster meaningful adoption.

Reflective Practice and Cyclical Learning Schön's (1983) reflective practitioner model aligns with teachers' "learn, apply, reflect, improve" cycle. The Knowles Teacher Initiative (2024) and Buckingham Shum et al. (2023) emphasize feedback literacy and iterative design. Teachers' calls for reflection journals, peer coaching, and demo lessons highlight the need for cyclical, collaborative professional development that adapts AI use to classroom realities.

Digital Equity and Access Theory Equitable AI integration requires addressing infrastructure, device availability, and digital literacy gaps. UNESCO (2023) advocates inclusive, rights-based AI adoption, while El Hassan and Alsalwah (2025) stress culturally appropriate training. Teachers' requests for flexible formats and peer mentoring reflect this principle. Professional development must therefore ensure

equitable access, ethical safeguards, and learner-centered design to prevent AI from deepening educational divides.

Theoretical Framework Proposal:

C.A.R.E. stands for Contextualized Adoption, Reflective Engagement, and is meant to help educators, institutions, and policymakers use AI tools ethically and effectively in literacy education. It brings together four key areas into a single model that stresses the importance of teacher agency, learner-centered design, and system responsiveness.

Proposed Framework: The C.A.R.E. Model for AI-Enhanced Literacy Instruction

The findings of this study informed the development of the C.A.R.E. Framework, Contextualized Adoption, Adaptive Pedagogical Design, Reflective Practice and Professional Growth, and Ethical and Relational Engagement. This framework synthesizes teacher perspectives with established theories, offering a comprehensive model for professional development in AI-enhanced literacy instruction.

Figure 1 presents the C.A.R.E. Framework, illustrating the four interconnected dimensions that guide ethical, effective, and inclusive AI integration in literacy education.

Elements of the C.A.R.E. Framework

Contextualized Adoption (C)

Grounded in the Technology Acceptance Model (Davis, 1989) and extended through Sociotechnical System Theory (Trist & Emery, 1973), this dimension emphasizes usability, relevance, and systemic readiness. Teachers highlighted the need for confidence and contextual fit, as Participant 7 noted the desire to *"gain confidence,"* while Participant 9 stressed choosing tools *"best suited for reading instruction."* Beyond individual acceptance, adoption requires infrastructure support, localized training, and equity measures (Plata et al., 2024).

Adaptive Pedagogical Design (A)

This dimension builds on the TPACK framework (Mishra & Koehler, 2006) and Sociocultural Theory (Vygotsky, 1978). Teachers expressed the need for training in prompt engineering, curriculum alignment, and differentiated instruction. Participant 1 emphasized the goal to *"create engaging reading materials,"* while Participant 6 highlighted *"improved instructional strategies."* Findings underscore that AI integration must be culturally responsive, developmentally appropriate, and aligned with learner identities (Gibbons, 2025).

Reflective Practice and Professional Growth (R)

Drawing from Schön's (1983) reflective practice and sociotechnical feedback loops, this dimension stresses iterative learning cycles. Teachers consistently advocated for *"learn, apply, reflect, improve"* models. Participant 5 emphasized ongoing improvement, while Participant 7 highlighted reflection journals and peer sharing. Initiatives such as the Knowles Teacher Initiative (2024) demonstrate how structured reflection and feedback literacy enhance adaptive teaching.

Ethical and Relational Engagement (E)

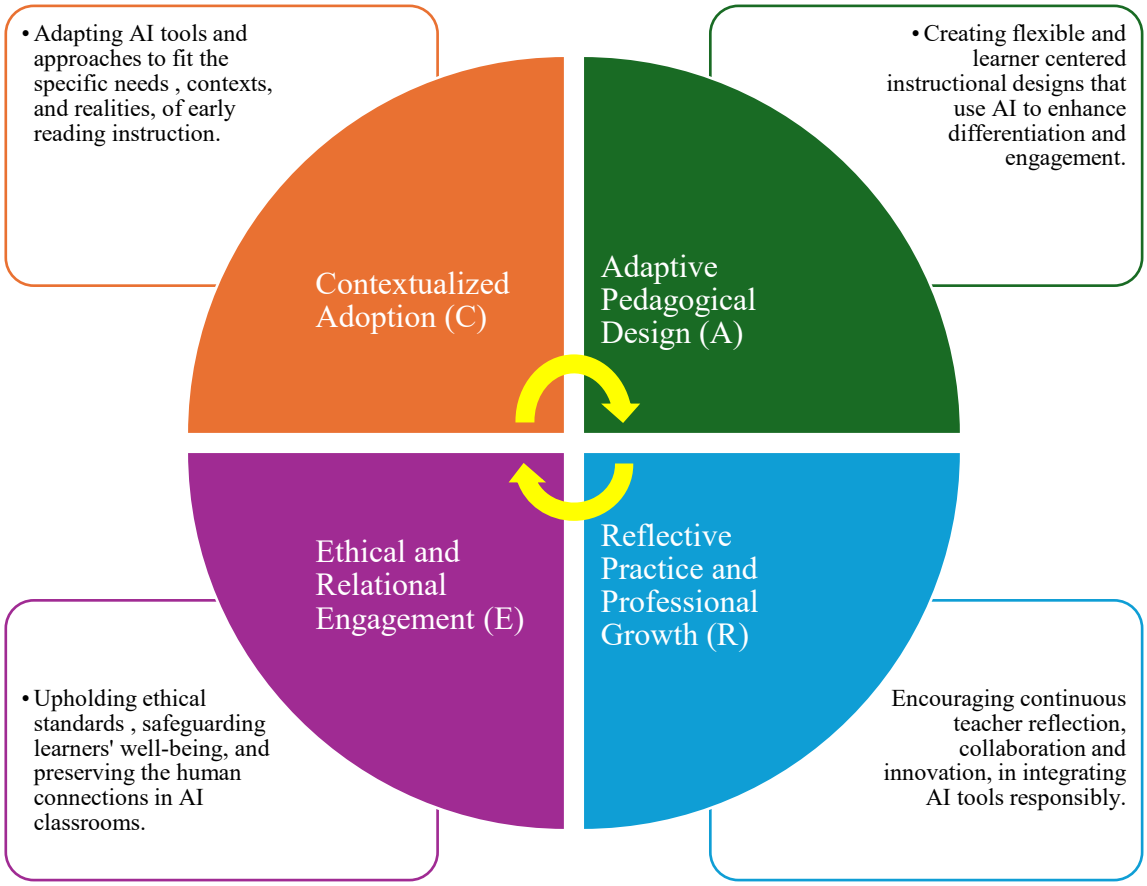
This dimension integrates Sociocultural Theory with ethical AI principles. Teachers raised concerns about privacy, safety, and relational integrity. Participant 1 emphasized *"guiding students in using AI responsibly,"* while Participant 7 stressed *"age-appropriate use."* Ethical training must include transparency, consent, and safeguarding practices (Berson et al., 2025; Digital Promise, 2024). AI must be applied in ways that preserve trust, care, and creativity in teaching.

Overall Contribution to Theory

The C.A.R.E. Framework validates existing models (TAM, TPACK, Reflective Practice) while extending

them through sociotechnical and sociocultural lenses. It critiques overly technical perspectives by centering teacher agency, learner diversity, and ethical responsibility. This framework offers a holistic guide for designing professional development, evaluating AI tools, and shaping policy for inclusive literacy instruction.

Figure 1 ***The C.A.R.E. Framework for AI Integration in Foundational Reading Instruction***



Note. The framework illustrates the four interrelated components of Contextualized Adoption, Adaptive Pedagogical Design, Reflective Practice and Professional Growth, and Ethical and Relational Engagement, which collectively guide teachers' professional development in AI-integrated foundational reading instruction.

Professional development should be tiered and modular, beginning with AI literacy basics and advancing toward instructional design strategies such as prompt engineering and differentiated content creation. Training must be cyclical, with workshops, follow-ups, peer mentoring, and collaborative formats. Reflection journals, feedback loops, and classroom-based experiments should be embedded to sustain growth. Institutions must also establish ethical guidelines, ensure equitable access, and contextualize AI integration to local priorities and learner identities.

Limitations of the Study

This study is based on qualitative data from a specific group of educators, which may limit generalizability. Reliance on self-reported data introduces potential bias, and the absence of long-term evaluation restricts conclusions about sustained impact. The C.A.R.E. Framework remains conceptual and requires empirical testing across diverse contexts. Future research should examine its effectiveness in guiding professional development, curriculum design, and policy implementation, while addressing technical challenges such as bias, language limitations, and data privacy.

Conclusions

1. Teachers recognize AI's role in transforming reading instruction by personalizing learning, fostering engagement, and improving instructional efficiency.
2. AI is perceived as a valuable support for materials development, lesson delivery, and assessment, strengthening learner-centered approaches.
3. Teachers ensure AI outputs are reliable by filtering and adapting them, treating AI as a complement to teacher expertise.
4. The significant barriers to AI integration are pedagogical misalignment to support curriculum aligned reading competencies and ethical safeguards to ensure safe and effective use.
5. Teachers emphasize the need for professional development to strengthen technical and innovative skills and ensure responsible AI use.

Recommendations:

1. A gradual and guided AI integration through pilot programs and mentoring to strengthen teacher's AI skills be promoted.
2. A curriculum -aligned and accessible AI tools that enhance instructional materials, teaching delivery, and assessment practices be mainstreamed.
3. A clear policy to guide teachers in filtering and adapting AI-generated content responsibly be implemented.
4. Facility investment, localized technical support, ethical guidelines, and development of localized AI applications to eliminate barriers be addressed.
5. The proposed C.A.R.E. Framework (Contextualized Adoption, Adaptive Pedagogical Design, Reflective Practice & Growth, Ethical & Relational Engagement) as the strategic professional development model, supported by LGUs, NGOs, private partners, and educational organizations be adopted.
6. A phase implementation plan and cost-benefit analysis to address connectivity and device gaps be conducted.

Future Research Directions:

1. Longitudinal Studies on Teachers' Experiences with AI Integration. Future research may employ longitudinal designs to trace how teachers' experiences, perceptions, and instructional practices evolve over time as they gain sustained exposure to AI.
2. Empirical Evaluation of AI's Impact on Student Learning and Engagement. Further studies are needed to measure the direct effects of AI on learners' reading comprehension, engagement, and literacy development.

3. Ethical, Equity, and Infrastructure Challenges in AI Adoption. Research should further explore the ethical, pedagogical, and infrastructural challenges identified by teachers, including issues of content accuracy, age-appropriateness, digital divide, and learner safety.
4. Design and Evaluation of Tiered Professional Development Models in AI Integration. Future inquiry may focus on differentiated professional learning models that combine technical competence, pedagogical innovation, and ethical AI use.
5. Validation and Localization of the C.A.R.E. Framework for Professional Development. The proposed C.A.R.E. Framework should be tested in varied contexts (e.g., rural vs. urban schools) to evaluate its adaptability, sustainability, and effectiveness in strengthening teacher readiness.

References:

1. IBM. (2024). *What is artificial intelligence (AI)?* IBM. https://www.ibm.com/topics/artificial-intelligence
2. NASA. (2024). *Artificial intelligence.* NASA. https://www.nasa.gov/artificial-intelligence
3. World Economic Forum. (2020). *Shaping the future of learning: The role of AI in Education 4.0.* World Economic Forum. https://www.weforum.org/reports/shaping-the-future-of-learning-the-role-of-ai-in-education-4-0
4. United Nations General Assembly. (2024, March 21). *General Assembly adopts landmark resolution on promoting safe, secure and trustworthy artificial intelligence systems for sustainable development.* UN News. https://news.un.org/en/story/2024/03/1148126
5. UNESCO. (2019). *Beijing Consensus on artificial intelligence and education.* UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000370300
6. Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Sage.
7. Stough, L. M., & Lee, S. W. (2021). Qualitative rigor in educational research. *Educational Researcher, 50*(2), 123–135.
8. Paapa, R., & Kambona, A. (2025). Grounded theory in educational technology research. *Journal of Qualitative Inquiry, 31*(1), 45–62.
9. Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal, 5*(6), 215–217.
10. Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health, 42*(5), 533–544
11. Krueger, R. A., & Casey, M. A. (2020). *Focus groups: A practical guide for applied research* (5th ed.). Sage.
12. Denzin, N. K. (2017). *The research act: A theoretical introduction to sociological methods.* Routledge.
13. Noble, H., & Smith, J. (2020). Issues of validity and reliability in qualitative research. *Evidence-Based Nursing, 23*(1), 36–38.
14. McLeod, J. (2024). *Ethics and qualitative research practice.* Routledge.
15. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Sage.
16. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.
17. Kushnir, L. P. (2025). Advances in thematic analysis for educational research. *International Journal of Qualitative Methods, 24*(2), 112–128

18. Alexandrowicz, M. (2024). Rethinking teacher agency in AI-supported instruction. *Journal of Digital Pedagogy, 9*(1), 22–35
19. Holcombe, T., & Wozniak, R. (2024). Relational creativity in AI-supported classrooms. *Computers & Education, 202,* 104812. https://doi.org/10.1016/j.compedu.2024.104812
20. Tripathi, S., Singh, R., & Kumar, A. (2025). Skill development and instructional quality in AI-supported classrooms. *Frontiers in Education, 10,* 1543210 https://doi.org/10.3389/feduc.2025.1543210
21. Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice* (3rd ed.). Teachers College Press.
22. UNESCO. (2022). *Reimagining our futures together: A new social contract for education.* Paris, France: UNESCO.
23. OECD. (2023). *Digital education outlook 2023: Bridging the digital divide.* Paris, France: OECD Publishing. https://doi.org/10.1787/c74f03de-en
24. Xue, H., Zhang, Y., & Chen, L. (2025). Adaptive AI feedback in literacy instruction: Enhancing learner motivation and participation. *Computers & Education: Artificial Intelligence, 6,* 100123. https://doi.org/10.1016/j.caeai.2025.100123
25. Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5–31. https://doi.org/10.1007/s11092-008-9068-5
26. Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences, 111*(23), 8410–8415. https://doi.org/10.1073/pnas.1319030111
27. Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), 235–266 https://doi.org/10.1023/B:EDPR.0000034022.16470.f3
28. Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning* (5th ed.). Allyn & Bacon.
29. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008
30. Ahmad, M., Shafie, A., & Jan, N. M. (2020). The impact of multimedia on reading comprehension among struggling learners. *International Journal of Instruction, 13*(2), 457–472. https://doi.org/10.29333/iji.2020.13231a
31. Alexandrowicz, R. W. (2024). Affective investment and adoption of AI in education. *Educational Technology Research and Development, 72*(4), 1123–1140. https://doi.org/10.1007/s11423-024-10123-7
32. Bearman, M., Ajjawi, R., Tai, J., & Boud, D. (2024). Cultivating evaluative judgment in the age of generative AI. *Assessment & Evaluation in Higher Education, 49*(2), 245–260. https://doi.org/10.1080/02602938.2023.2294567
33. Dorongon, M. A., & Sarmiento, J. M. (2025). Teachers' readiness for artificial intelligence integration in teaching and learning. *Frontiers in Education, 10,* 1543229. https://doi.org/10.3389/feduc.2025.1543229
34. Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., et al. (2023). Artificial intelligence in education: Personalization, engagement, and adaptive feedback. *Information Systems Frontiers, 25*(2), 531–548. https://doi.org/10.1007/s10796-022-10328-3

35. Hidayat, L. E., Basthomi, Y., & Afrilyasanti, R. (2024). Exploring secondary school teachers' creativity in differentiated instruction practices across Indonesian EFL classrooms. *Thinking Skills and Creativity, 53,* 101620. https://doi.org/10.1016/j.tsc.2024.101620
36. Huang, Y., Lv, J., Lu, Y., & Tu, Y. (2025). Evaluating AI-generated educational resources: Accuracy, authenticity, and legitimacy. *Computers & Education, 196,* 104689. https://doi.org/10.1016/j.compedu.2025.104689
37. ISTE. (2024). *Blended professional learning for educators: Combining synchronous and asynchronous formats.* Washington, DC: International Society for Technology in Education.
38. Knight, J. (2017). *The impact cycle: What instructional coaches should do to foster powerful improvements in teaching.* Thousand Oaks, CA: Corwin.
39. Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: A meta-analytic review. *Review of Educational Research, 86*(1), 42–78. https://doi.org/10.3102/0034654315581420
40. Livingstone, S., & Third, A. (2017). Children and young people's rights in the digital age: An emerging agenda. *New Media & Society, 19*(5), 657–670. https://doi.org/10.1177/1461444816686318
41. Ma, Q., & Chen, Y. (2024). Meta-analysis of AI-assisted personalized learning effects on student outcomes. *Computers & Education, 194,* 104672. https://doi.org/10.1016/j.compedu.2024.104672
42. Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
43. Soni, R. (2025). Collaborative professional development for AI integration in education. *Frontiers in Education, 10,* 1651220. https://doi.org/10.3389/feduc.2025.1651220
44. Tripathi, S., Singh, R., & Kumar, A. (2025). Skill development and instructional quality in AI-supported classrooms. *Frontiers in Education, 10,* 1543210.
45. UNESCO. (2022). *AI and education: Guidance for policy makers.* Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000380602
46. U.S. Department of Education. (2023). *Artificial intelligence and the future of teaching and learning: Insights and recommendations.* Washington, DC: Office of Educational Technology.
47. Van Dijk, J. (2020). *The digital divide.* Cambridge, UK: Polity Press.
48. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Cambridge, MA: Harvard University Press.
49. Wu, Y. (2024). Adaptive AI technologies in literacy instruction: Contextualized integration for inclusive learning. *Computers & Education, 195,* 104678. https://doi.org/10.1016/j.compedu.2024.104678
50. Xue, H., Zhang, Y., & Chen, L. (2025). Adaptive AI feedback in literacy instruction: Enhancing learner motivation and participation. *Computers & Education: Artificial Intelligence, 6,* 100123. https://doi.org/10.1016/j.caeai.2025.100123
51. Zhao, Y. (2025). Artificial intelligence and education: End the grammar of schooling. *ECNU Review of Education, 8*(1), 3–20. https://doi.org/10.1177/20965311241265124
52. Zhou, Y., Li, H., & Chen, J. (2024). Teacher resilience and professional learning communities: Supporting educators in curriculum reform contexts. *International Journal of Educational Development, 92,* 102657. https://doi.org/10.1016/j.ijedudev.2024.102657
53. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

54. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x
55. Schön, D. A. (1983). *The reflective practitioner: How professionals think in action.* Basic Books. ISBN: 9780465068784
56. Trist, E., & Emery, F. (1973). *Toward a social ecology: Contextual appreciation of sociotechnical systems.* Plenum Press. ISBN: 9780306390642
57. Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192
58. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press. ISBN: 9780674576292
59. Ruslim, R., & Khalid, M. (2024). *Building TPACK skills in AI-supported literacy instruction.*
60. Schön, D. A. (1983). *The reflective practitioner: How professionals think in action.* Basic Books.
61. SFIA Foundation. (2024). *AI skills framework.* SFIA.
62. Trist, E., & Emery, F. (1973). *Toward a social ecology: Contextual appreciation of sociotechnical systems.* Plenum Press.
63. UNESCO. (2023). *AI in education policy guidelines.* UNESCO.
64. Venkatesh, V., & Bala, H. (2008). *Technology acceptance model 3 and a research agenda on interventions.* Decision Sciences, 39(2), 273–315.
65. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.