



Simple AI Tools for Personalized Learning: A Qualitative Exploration of Classroom Experiences

Ardian Asyhari¹, Ghifar Javad H Aziz¹, and Siti Amelia Agustin¹

¹Universitas Islam Negeri Raden Intan Lampung, Indonesia

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Abstract

This study investigates how teachers experience the use of simple artificial intelligence (AI) tools in supporting personalized learning, addressing the broader educational challenge of integrating emerging technologies into everyday classroom practice. Using a qualitative phenomenological design, the study draws on semi-structured interviews, classroom observations, and instructional documents from twelve primary and secondary school teachers who regularly employed AI-assisted text simplifiers, writing tools, and automated feedback generators. Data were analyzed using thematic analysis to capture patterns in teachers' perceptions, instructional decisions, and strategies for validating AI outputs. Three core themes emerged: AI as a catalyst for differentiated content creation, shifts in the feedback process that enable deeper instructional dialogue, and the continued importance of teacher judgment in curating and contextualizing AI-generated material. These findings highlight how AI can enhance personalization and instructional efficiency while reinforcing the pedagogical and ethical role of the teacher in maintaining accuracy and cultural relevance. The study contributes to ongoing debates about AI-enhanced teaching by clarifying how every day, low-complexity tools reshape teacher agency, professional identity, and classroom practice.

Keywords: artificial intelligence in education; personalized learning; teacher experiences; phenomenology; classroom practice

Corresponding Author:

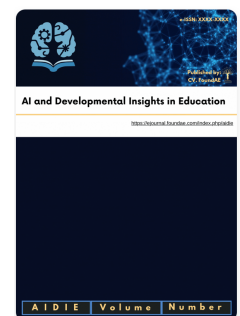
Ardian Asyhari

Email: ardianasyhary@radenintan.ac.id

 <https://orcid.org/0000-0002-4796-1103>

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Introduction

The increasing presence of artificial intelligence (AI) in educational practice has renewed longstanding questions about how technology can support differentiated learning and developmental growth. While research on sophisticated adaptive systems has advanced theoretical and technical understandings of AI in education, far less is known about how simple, readily available AI tools are interpreted and enacted by teachers in everyday classrooms. This gap is consequential. Personalization, often presented as a technical function of AI, remains deeply tied to cognitive, linguistic, and socioemotional development, and therefore depends on instructional decisions made within real institutional, cultural, and pedagogical conditions. In classrooms where learners exhibit diverse developmental profiles, teachers frequently require adaptable materials and timely feedback mechanisms. Simple AI tools appear to offer such affordances; however, their integration is neither automatic nor pedagogically neutral. It is shaped by teachers' judgments, contextual constraints, and understandings of the developmental implications of AI-mediated instruction.

Scholarship in the learning sciences underscores the importance of differentiated materials and responsive feedback for supporting learner development (Goyibova et al, 2025), while AI education research emphasizes the potential of algorithmic tools to automate routine tasks and scaffold learner progress (Banihashem et al., 2025; Nopas, 2025). Yet these bodies of work often converge on assumptions that personalization emerges primarily from system design rather than from teacher mediation. Much of the empirical evidence derives from high-resource environments equipped with advanced AI platforms, leaving unresolved questions about how personalization unfolds through lightweight tools that teachers can adopt independently. Moreover, prior studies commonly report technical or administrative outcomes, offering limited insight into the interpretive, developmental, and pedagogical reasoning that guides teachers' actual use of AI. This absence of qualitative evidence restricts the field's understanding of how teachers navigate the tensions between efficiency, accuracy, contextual relevance, and developmental appropriateness when incorporating AI into instruction.

Against this backdrop, the present study examines how teachers make sense of and employ simple AI tools within personalized learning contexts. The study addresses two central questions: (a) How do teachers perceive and experience the role of simple AI tools in supporting personalized learning? and (b) What opportunities and challenges arise when these tools are integrated into daily classroom practice? A qualitative phenomenological approach is adopted to foreground teachers' interpretive processes and to illuminate the meanings they attribute to AI-mediated instruction. This orientation is appropriate given the study's aim to understand how personalization is co-constructed through the interplay of teacher judgment, technological affordances, and the developmental needs of learners.

By situating teachers' experiences within broader theoretical and empirical debates, this study extends current work on AI in education in three ways: it shifts attention from complex systems to accessible tools, it foregrounds the developmental and pedagogical implications of AI use, and it elucidates how personalization emerges through human–AI collaboration rather than technological automation alone. In doing so, the study contributes a nuanced perspective to ongoing discussions of human-centered AI and offers practical insights for educators, policymakers, and designers seeking to support equitable and context-sensitive AI integration in schools.

Methods

Research Design

This study used a qualitative phenomenological design to explore teachers' lived experiences with simple artificial intelligence (AI) tools in personalized learning contexts. A phenomenological approach was appropriate because it emphasizes the meanings individuals assign to specific experiences and allows for deep examination of how teachers interpret AI-supported instruction (Creely & Carabott, 2025). The design aligned with the research objectives, which sought to uncover nuanced perceptions, classroom practices, and contextual challenges encountered when integrating AI into teaching. An overview of the study's methodological framework is provided in Table 1.

Table 1

Overview of Research Design

Component	Description
Research Approach	Qualitative, phenomenological design
Research Focus	Teachers' experiences with simple AI tools for personalized learning
Unit of Analysis	Individual classroom teachers
Setting	Public and private schools integrating basic AI applications
Data Sources	Semi-structured interviews, non-participant observations, and document analysis
Duration	Three-month data collection period

Note. This table summarizes the methodological framework guiding the study.

Participants and Researcher Positioning

Participants

Participants were twelve primary and secondary school teachers from four schools in Bandarlampung, Indonesia. Inclusion criteria required (a) active use of simple AI tools—such as content simplifiers, automated feedback generators, and AI-assisted question builders—for at least three months prior to data collection and (b) willingness to participate in interviews and classroom observations. No exclusion criteria beyond non-use of AI tools were applied. Participants' teaching experience ranged from 3 to 18 years, and they represented multiple subject areas including science, language arts, and social studies. Demographic variation across gender (seven female, five male), grade level, and disciplinary context enabled a rich diversity of experiential accounts.

Researcher Positionality and Reflexivity

As qualitative inquiry recognizes the researcher as an instrument of interpretation, reflexivity was integrated throughout the study. The lead researcher had prior professional experience in educational technology and teacher development, which provided contextual understanding yet carried the risk of interpretive bias. To mitigate this influence, the researcher maintained reflexive memos, engaged in peer debriefing, and documented analytic decisions in an audit trail. The researcher had no supervisory role or prior relationships with participants, minimizing the potential for power dynamics to affect data collection.

Sampling and Recruitment

Purposive sampling was employed to select teachers with direct and varied experiences using simple AI tools in classroom instruction. School administrators distributed study invitations, and teachers contacted the researcher independently, reducing institutional

pressure. Sixteen teachers initially expressed interest; twelve met the inclusion criteria and agreed to participate. Recruitment ceased once thematic sufficiency was achieved—signaled by redundancy in emergent codes and stabilization of conceptual categories during analysis. No incentives were provided, and participation was voluntary.

Sample Size, Power, and Precision

As consistent with phenomenological inquiry, sample adequacy was justified based on the depth, richness, and interpretive complexity of the narratives rather than statistical generalizability. Twelve participants provided sufficient variation to capture cross-case nuance while allowing detailed idiographic analysis. Data saturation was assessed through iterative coding, and no new themes emerged after the tenth interview; however, additional cases were retained to ensure analytic robustness.

Measures, Instruments, and Data Sources

Data were generated through three primary instruments: semi-structured interviews, classroom observations, and document analysis. Interviews elicited teachers' interpretations of AI use, their pedagogical reasoning, and specific instructional episodes shaped by AI. Classroom observations captured real-time AI integration, teacher–AI interaction dynamics, and student engagement. Documents, such as lesson plans, AI-generated worksheets, and teacher reflections, provided material evidence of how AI outputs were curated and contextualized. A summary of the instruments is presented in Table 2.

Table 2
Summary of Research Instruments

Instrument	Focus	Data Contribution
Semi-Structured Interviews	Teachers' personal and pedagogical experiences with AI	Provides in-depth interpretive narratives
Classroom Observations	Real-time enactment of AI during instruction	Captures authentic classroom behaviors and contextual practices
Document Analysis	Lesson plans, AI-generated materials, reflective notes	Offers evidence of how AI outputs are curated, adapted, and validated

Note. Instrument quality was supported through expert review, a pilot interview, and triangulation across sources.

Data Collection Procedures

Data collection occurred over twelve weeks across participating schools. Interviews were conducted in private school offices or via secure online platforms, lasted 45–60 minutes, and were audio-recorded with consent. Classroom observations were conducted across two consecutive instructional sessions for each teacher to capture recurring patterns of AI usage. Reflexive notes were written immediately after each observation to record contextual impressions and analytic prompts. Instructional documents were collected following observations and analyzed iteratively. All interview transcripts were verified through participant member checking to enhance accuracy. Data collection followed an emergent, recursive process, allowing adjustments to questioning and memoing in response to developing insights, consistent with qualitative inquiry. The core stages of data collection are summarized in Table 3.

Table 3
Summary of Data Collection Procedure

Stage	Core Activity	Purpose
Initial Contact	Recruitment and informed consent	Ensures ethical compliance and voluntary participation
Interviews	Semi-structured interviews with each teacher	Captures experiential accounts and interpretive meaning
Observations	Classroom monitoring over two instructional sessions	Documents real-time AI integration and teacher practice
Document Gathering	Collection of lesson materials and AI outputs	Provides corroborating evidence of AI-supported teaching
Member Checking	Transcript verification by participants	Enhances credibility and interpretive accuracy

Data Analysis

Reflexive thematic analysis (Ahmed et al, 2025) was employed. The process involved immersion in the dataset, generation of inductive codes, development and refinement of candidate themes, and construction of a final thematic structure. Coding categories emerged organically from the data rather than being predetermined. NVivo 14 software facilitated systematic organization, hierarchical coding, memoing, and cross-case analysis. Peer debriefing and triangulation across interviews, observations, and documents enhanced interpretive rigor, while an audit trail documented analytic decisions. A summary of the analysis phases is presented in Table 4.

Table 4
Summary of Thematic Analysis Procedure

Stage of Analysis	Core Activity	Analytical Purpose
Data Familiarization	Repeated reading of transcripts and notes	Establishes deep interpretive engagement
Coding	Identification of meaningful units of meaning	Produces analytic building blocks
Theme Development	Grouping and refinement of codes	Constructs initial conceptual structure
Theme Review	Cross-checking themes against full dataset	Ensures coherence and representativeness
Theme Definition	Clarifying thematic boundaries and meanings	Strengthens conceptual clarity
Final Synthesis	Integrating themes into findings narrative	Produces interpretive account of the phenomenon

Validity, Reliability, and Methodological Integrity

Methodological integrity was demonstrated through fidelity to participants' accounts, coherence between research questions and analytic procedures, and grounding interpretations in evidence. Trustworthiness was strengthened through triangulation, prolonged engagement, member checking, reflexive memoing, peer debriefing, and maintenance of an audit trail. Interpretive consistency, rather than replicability, served as the reliability criterion, consistent with phenomenological inquiry.

Ethical Considerations

Ethical approval was obtained from the Institutional Research Ethics Committee before data collection. Participants were informed of the study's purpose, procedures, confidentiality

protections, and their right to withdraw at any time. Written consent was obtained prior to participation. Pseudonyms replaced identifying information in transcripts and reports, and digital files were stored on encrypted, password-protected devices. No vulnerable populations were involved.

Results

The Results are presented in accordance with qualitative reporting standards and follow the analytic logic of the interpretive phenomenological approach. Findings are reported without theoretical interpretation, which is reserved for the Discussion. Data were collected between March and May 2024 through interviews, classroom observations, and document analysis. The presentation begins with participant flow and recruitment chronology, followed by the thematic findings derived from the reflexive thematic analysis.

Participant Flow

A total of 16 teachers initially expressed interest in the study. After applying the inclusion criterion of having used simple AI tools for at least three months, 12 teachers were enrolled and completed all stages of data collection. No participants withdrew during the study, and no cases required exclusion after enrollment.

Recruitment and Data Collection Period

Recruitment occurred from March 1–15, 2024. Interviews and classroom observations were conducted from March 20 to May 30, 2024. All 12 participants completed a single in-depth interview and two observation sessions, and all provided instructional documents. No follow-up interviews were required because saturation was reached during the primary data collection period.

Qualitative Findings

Three overarching themes emerged from the data:

- (1) AI as a catalyst for differentiated content creation,
- (2) Redefining the feedback loop, and
- (3) The human-in-the-loop: authorship and validation.

Themes and subthemes were grounded in repeated patterns across interviews, observations, and documents. Representative data excerpts were used to support but not replace analytic description.

A detailed summary appears in Table 5, which is referenced here before its placement.

Table 5
Summary of Key Themes and Subthemes

Theme	Subtheme	Key Data Source Evidence
1. AI as a catalyst for differentiated content creation	Speed and scalability	Teachers rapidly generated multi-level reading materials; observed use of AI-simplified texts.
	Resource variety	AI-created examples, analogies, and localized scenarios across subjects.
2. Redefining the feedback loop	Immediacy of response	Immediate AI feedback on grammar, structure, and concept clarity noted during writing tasks.
	Shift in teacher focus	Observations showed teachers emphasizing conceptual coaching over mechanical correction.
3. Human-in-the-loop: authorship and validation	Curator role	Teachers edited, reorganized, or validated AI output before use.
	Contextualization	AI content adapted to cultural norms and classroom contexts; confirmed through document analysis.

Note. Themes were derived through iterative coding and cross-comparison of interviews, observations, and documents.

Theme 1: AI as a Catalyst for Differentiated Content Creation

Teachers consistently described AI as enabling rapid, scalable generation of instructional materials tailored to diverse student needs. Subthemes included *speed and scalability*, reflected in teachers' ability to produce multi-level reading materials within minutes, and *resource variety*, evidenced by AI-generated examples, localized scenarios, and alternative explanations. Observational data confirmed that AI-assisted materials were used to modify reading difficulty, vocabulary levels, and conceptual depth across lessons.

Theme 2: Redefining the Feedback Loop

Across cases, AI changed the temporal dynamics of feedback. The subtheme *immediacy of response* captured teachers' reliance on AI to produce instant grammar, structure, and concept-level feedback, which was observed during writing and reading activities. The subtheme *shift in teacher focus* reflected teachers' movement away from mechanical correction toward conceptual coaching, as they used classroom time to address misconceptions that AI alone could not resolve.

Theme 3: The Human-in-the-Loop: Authorship and Validation

Although teachers used AI extensively, they remained central to content vetting and contextualization. The subtheme *curator role* described teachers' processes for selecting, editing, or discarding AI-generated materials based on accuracy and curricular alignment. The subtheme *contextualization* reflected the adaptation of AI outputs to local cultural norms, examples familiar to students, and classroom-specific language practices. Document analysis showed persistent annotation, modification, and restructuring of AI-generated texts before classroom use.

Discussion

This study examined teachers' lived experiences with simple AI tools in personalized learning environments, offering interpretive insights that extend current theoretical and empirical discussions in AI-mediated pedagogy. Consistent with phenomenological inquiry (Creely & Carabott, 2025), the findings illuminate how teachers make meaning of their encounters with AI, revealing affective, cognitive, and instructional dimensions that shape adoption. These results respond directly to the guiding research question by showing how AI reshapes teachers' pedagogical reasoning, workflow, and professional identities. As scholars have noted, understanding teachers' subjective experiences is essential for theorizing AI integration at scale (Ghiasvand & Seyri., 2025; Guan et al, 2025).

The first theme, AI as a catalyst for differentiated content creation, demonstrates that teachers perceived AI as expanding their capacity to produce multi-level materials efficiently. This finding aligns with existing studies showing that AI-supported text generation can facilitate differentiated instruction and reduce planning time (Li & Wilson, 2025; Wu et al., 2025). However, the present study extends prior work by illustrating how even low-complexity AI tools, rather than advanced adaptive learning systems, can meaningfully support differentiation, particularly in resource-limited contexts. Teachers' use of AI to create localized examples also resonates with sociocultural perspectives on learning, which emphasize contextual relevance and cultural responsiveness (Eguchi et al, 2021; Grab, 2025). The disciplinary variation observed here further supports recent findings that AI tools influence subjects differently depending on epistemic norms and curriculum structures (Dai, 2023).

The second theme, redefining the feedback loop, contributes to existing knowledge by clarifying how AI alters the temporal and cognitive structure of formative assessment. Prior research shows that AI can accelerate feedback cycles and enhance personalization (Mohammadi Zenouzagh et al., 2025; Trajkovski & Hayes, 2025), yet this study deepens these insights by demonstrating how teachers reallocate instructional attention when AI handles surface-level corrections. Teachers in this study shifted toward conceptual clarification and dialogic coaching, echoing arguments that AI should augment, not replace, human pedagogical expertise (Mouta et al., 2025). At the same time, concerns about accuracy and overreliance reflect previously documented risks around AI hallucinations and pedagogical misalignment (Williamson & Prybutok, 2024; Zhai et al., 2024). Thus, while AI supports efficiency, teachers maintain a critical evaluative stance consistent with findings on technological scepticism in classroom contexts (Nazaretsky et al., 2022).

The third theme, human-in-the-loop: authorship and validation, reinforces theoretical claims that teachers remain central in mediating AI outputs (Chen & Pi, 2025). The study reveals that teachers actively curate, validate, and contextualize AI-generated materials, engaging in what Almuhanha (2025) describes as "critical digital pedagogical work." This professional vigilance challenges deterministic narratives that portray AI as autonomous instructional agents. Instead, the findings support the perspective that effective AI integration relies on teachers' domain expertise, ethical judgment, and contextual awareness (Daher, 2025). The tension between efficiency and epistemic responsibility observed here mirrors findings from recent human–AI collaboration research, which emphasizes the necessity of maintaining human oversight to ensure pedagogical, cultural, and ethical appropriateness (Holzinger et al., 2025; Tanchuk & Taylor, 2025).

Interpretively, the three themes collectively contribute to broader debates about teacher agency and professional identity in AI-enhanced learning environments. Teachers reported increased creative capacity and efficiency, but also expressed concerns about authorship

integrity, echoing findings from studies on teacher identity negotiation in technologically mediated contexts (Parker et al., 2025; Sun & Lan, 2025). The dual sense of empowerment and caution further aligns with research exploring educators' ambivalence toward emerging technologies (Küçükuncular & Ertugan, 2025). From a theoretical standpoint, the findings support the argument that AI should be conceptualized as a sociotechnical partner shaped by human interpretation and contextual norms (Sartori & Theodorou, 2022) not as a neutral or deterministic tool.

Reflexively, alternative interpretations could consider how participants' technological familiarity, institutional mandates, or local infrastructures might have shaped their experiences. Observed differences across subjects and school types also suggest that contextual and cultural factors play significant roles in shaping AI use, warranting future exploration. Methodologically, the integration of interviews, observations, and documents strengthened interpretive credibility, yet certain nuances, such as implicit beliefs or emotional responses, may have remained unspoken despite member-checking procedures.

The study's limitations stem from the bounded sample size, regional context, and reliance on teachers who were already motivated to engage with AI tools. These constraints shape the transferability of findings while also illuminating pathways for future research, such as examining AI-supported personalization across rural contexts, disciplinary variations, or mixed-proficiency classrooms. Despite these boundaries, the study contributes meaningfully to ongoing discourse on AI-enhanced pedagogy, offering grounded insights into how teachers navigate the evolving relationships between professional judgment, technological mediation, and instructional creativity.

Conclusion

This study provides a comprehensive, phenomenological account of how teachers experienced the integration of simple AI tools in personalized learning settings, revealing how AI reshapes content preparation, feedback dynamics, and professional authorship. By uncovering three central themes, AI-driven differentiation, reconfigured feedback loops, and the sustained necessity of human validation, the study advances conceptual understandings of teacher–AI interaction beyond functional descriptions toward a more relational and interpretive perspective. The findings underscore that while AI can enhance instructional efficiency and broaden pedagogical resources, teachers remain essential as curators, contextualizers, and ethical stewards of AI-mediated learning. The study's insights contribute to ongoing scholarly conversations about the future of AI in education, highlight the importance of teacher agency in technological adoption, and suggest avenues for refining professional development, AI literacy frameworks, and policy structures that support responsible integration. While bounded by its regional and sample-specific context, this research offers forward-looking implications for exploring how simple AI tools can be leveraged across diverse educational environments and invites continued inquiry into the evolving pedagogical, ethical, and cultural dimensions of AI-enhanced teaching and learning.

Author Contributions

AA conceptualized the study, supervised the research process, and led the development of the methodological framework. GA was responsible for data collection, data curation, and

preliminary quantitative analysis. SA contributed to instrument preparation, literature review synthesis, and qualitative coding. All authors (AA, GA, SA) jointly interpreted the findings, revised the manuscript critically for intellectual content, and approved the final version for submission.

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