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Exploring English Teachers' Voices: Challenges in Integrating AI-Based Tools into Classroom Practices at Senior High Schools

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Abstract

This study explores the challenges faced by English teachers in integrating artificial intelligence (AI)-based tools—such as Grammarly and conversational chatbots—into classroom practices at senior high schools. Employing a qualitative case study design, data were collected through semi-structured interviews with 15 teachers to examine institutional, technical, and socio-cultural barriers that shape AI adoption. The findings highlight three central themes. First, technical limitations emerge as a critical barrier, encompassing unstable internet connectivity, outdated hardware, and limited access to supporting infrastructure. Second, pedagogical gaps reflect teachers' insufficient training in adapting AI tools to localized curricular demands, resulting in underutilization of available technologies. Third, cultural resistance stems from entrenched traditional teaching norms and skepticism toward technology-driven approaches, which often conflict with established classroom practices. These findings mirror broader global disparities in educational technology adoption, where systemic inequities continue to constrain digital transformation in under-resourced regions. The study emphasizes the urgency of implementing targeted interventions, including government-supported professional development programs and policy initiatives to modernize rural ICT infrastructure. By centering teacher perspectives, this research contributes to a deeper understanding of adaptation dynamics in low-resource educational contexts. Furthermore, it provides actionable insights for policymakers and practitioners seeking to reduce the urban-rural digital divide and foster more equitable integration of AI in education.

Keywords: AI-based tools; English teachers; Technology integration; Educational challenges; Teacher voices

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INTRODUCTION

The global educational landscape is currently undergoing a profound transformation with the integration of artificial intelligence (AI) into pedagogical practices. This shift is not merely a technological advancement but represents a fundamental change in how learning and teaching are conceptualized. AI's potential to personalize instruction, automate assessments, and increase efficiency has positioned it as a critical driver of educational innovation (Yusuf & Prasetyo, 2025). The emergence of AI-based tools such as Grammarly for real-time grammar correction, Duolingo for adaptive language practice, and conversational agents like ChatGPT has provided learners with platforms that simulate interaction, deliver instant feedback, and adapt learning materials to individual

needs. These affordances align with constructivist principles that emphasize learner-centered approaches and active participation in the knowledge-building process (UNESCO, 2022).

Despite its promise, the integration of AI into education has been uneven across different geographical and socio-cultural contexts. In technologically advanced nations, AI has rapidly become embedded into mainstream curricula, supported by strong infrastructure and digital literacy initiatives (Bekker et al., 1999). However, in many developing regions, systemic disparities hinder meaningful adoption. For example, in Southeast Asia—and particularly in rural Indonesia—schools face persistent challenges such as poor internet connectivity, outdated hardware, and insufficient teacher training (Patel & Kumar, 2023). These issues not only reinforce the digital divide but also shape teachers' perceptions of AI as impractical or irrelevant for their classrooms. Consequently, AI adoption is often restricted to urban centers, leaving rural communities marginalized from the benefits of educational technology (Artha et al., 2024; Eslit, 2024).

Cultural and pedagogical traditions further complicate this landscape. Many Southeast Asian educational systems, including those in Indonesia, remain rooted in conventional models of face-to-face instruction. Teachers often rely heavily on direct transmission methods that privilege teacher authority over learner autonomy. This cultural orientation sometimes clashes with AI-enhanced pedagogies that emphasize blended learning, independent exploration, and collaborative digital engagement (Sain et al., 2024; Hanspal et al., 2024). In such contexts, AI is not perceived as a transformative innovation but rather as a supplementary tool, unable to replace entrenched classroom practices. The tension between global educational reforms and localized pedagogical traditions illustrates the complexity of implementing AI-driven models in diverse educational ecosystems.

Another critical dimension of this challenge lies in teachers' levels of AI literacy and their concerns regarding the ethical and pedagogical implications of AI use. Educators frequently express apprehensions about issues such as data privacy, surveillance, and the risk of students becoming overly dependent on automated feedback at the expense of developing higher-order thinking skills. A 2024 study on Indonesian teachers revealed that many educators regard AI applications as supplementary rather than transformative, citing their misalignment with curriculum demands and their limited applicability in resource-constrained classrooms (Alqahtani & Rajkhan, 2024). In East Lombok, where large class sizes and limited resources characterize the educational environment, the democratizing potential of AI remains far from realized. Structural challenges, coupled with cautious teacher attitudes, underscore the urgent need to investigate how AI can be effectively localized to meet the realities of under-resourced communities (Rahman & Supriyanto, 2025).

Past research has primarily concentrated on technologically privileged environments, especially higher education and urban schools. Studies from universities in developed nations highlight AI's role in reducing grading burdens, fostering learner autonomy, and improving personalized instruction through adaptive platforms like ChatGPT and Duolingo (Chen et al., 2022; Huang et al., 2025). For instance, AI-driven feedback systems have been reported to streamline assessment processes while enhancing student engagement in language learning tasks (Huang et al., 2025). Similarly, the AILang Project (2024) documented the widespread integration of AI tools among tertiary-level educators, attributing success to supportive digital infrastructure and institutional readiness (Chen et al., 2022; Kakhkharova & Tuychieva, 2024).

However, this concentration on urban and tertiary contexts has left a critical gap in the literature: the experiences of secondary school educators in rural, under-resourced regions. UNESCO (2022) emphasized that rural schools continue to lag behind in digital

integration, while Alqahtani & Rajkhan (2024) reported that many teachers in developing countries lack adequate training to use AI effectively. In Cambodia and Laos, Nguyen & Tran (2024) found that secondary educators often perceive AI tools as irrelevant due to their inability to align with localized curricular requirements. Comparable resistance has been observed in Indonesia, particularly in East Lombok, where traditional pedagogical practices persist despite the broader global movement toward AI-enhanced education (Kakhkharova & Tuychieva, 2024; Hanspal et al., 2024).

This highlights the need to examine the intersection of systemic barriers and teacher agency. Teacher agency, defined as the ability of educators to innovate within structural and cultural constraints, plays a central role in shaping the trajectory of AI adoption. Yet, existing scholarship often overlooks the perspectives of educators in rural settings who must negotiate limited resources, institutional inertia, and community expectations. Patel & Kumar (2023) argued that policies frequently ignore the compounded effects of poverty, gender inequality, and lack of access to technology, thereby exacerbating inequities in digital adoption. Similarly, Hossain (2024) underscored the importance of grassroots perspectives in designing inclusive educational technologies, which can only be achieved through localized research attentive to the realities of marginalized communities.

This study seeks to address this gap by focusing specifically on English teachers in East Lombok, Indonesia. As the first localized exploration of AI integration barriers in this region, it fills an important void in global research on AI in education (Sain et al., 2024). Unlike prior works that have predominantly analyzed urban and higher education contexts (Huang et al., 2025; Darmawan et al., 2024), this study situates its inquiry in secondary schools within resource-constrained environments. By foregrounding teacher narratives, it captures how individual agency interacts with socio-cultural constraints such as traditional teaching norms, parental expectations, and institutional inertia. This localized focus challenges universalist assumptions about AI adoption and contributes to the development of more nuanced frameworks that account for diversity in educational contexts (Ghimire & Edwards, 2024; Naszariah Nasni Naseri & Abdullah, 2024).

The novelty of this study lies in its intersectional approach, which simultaneously considers infrastructural, institutional, and cultural factors shaping AI integration. While prior studies have highlighted either technical barriers or teacher attitudes in isolation, this research emphasizes the interplay among these dimensions. Moreover, it recognizes the significance of teacher agency as both a barrier and an opportunity in adopting AI in resource-poor contexts. By centering voices from East Lombok, it challenges dominant discourses that often generalize findings from urban and technologically advanced regions to all educational settings.

The research problem guiding this study is therefore twofold: (1) What challenges do teachers face in adopting AI tools? and (2) How do institutional and cultural factors influence resistance to AI adoption? These questions reflect the need to unpack both structural and personal dynamics that determine the extent to which AI can be integrated into rural schools. Based on this problem, the objectives of the study are: to identify and analyze systemic and individual barriers to AI integration in rural Indonesian schools, particularly in East Lombok; to map the technical, pedagogical, and attitudinal challenges faced by English teachers; and to propose context-sensitive recommendations for policymakers and educators to bridge the digital divide in rural education.

In addressing these objectives, the study aims to generate new knowledge about how global educational innovations intersect with localized realities. It raises critical questions about the universality of digital transformation models and foregrounds the importance of designing strategies that prioritize equity, cultural relevance, and teacher empowerment. By doing so, it not only contributes to scholarly debates on AI in education but also offers actionable insights for policymakers and practitioners committed to

fostering inclusive and context-appropriate educational reforms (Ngo & Khâm, 2024; Chen et al., 2022).

METHOD

Research Design

This study employs a qualitative case study design to explore the multifaceted challenges faced by English teachers in integrating AI-based tools within rural educational contexts (Itzik & Walsh, 2023; Braun & Clarke, 2022). A case study approach is particularly suitable for examining complex phenomena within their real-world settings, allowing for an in-depth analysis of systemic and individual barriers (Kobayashi, 2021). To capture the lived experiences of participants, the research adopts a phenomenological approach, focusing on how teachers perceive and interpret their struggles with technological adoption in classrooms characterized by limited resources and traditional pedagogical norms (Pedida & Diaz, 2023; (Rustandi et al., 2024). This methodological choice aligns with the study's aim to prioritize teacher agency and contextual nuances over generalized trends, thereby enriching theoretical frameworks on AI integration in education (Braun & Clarke, 2022). The research design emphasizes iterative data collection through semi-structured interviews and document analysis, ensuring triangulation to enhance validity (Meydan & Akkaş, 2024). By situating the study within the socio-cultural landscape of East Lombok, the approach bridges gaps between global AI-driven educational paradigms and localized realities, contributing to both empirical and theoretical discourse (Braun & Clarke, 2022; Marlina et al., 2024).

Population and Sample

The target population consists of English teachers working in public senior high schools across East Lombok, Indonesia (LinkedIn, 2024; Palinkas et al., 2022). This group was selected due to its relevance to the study's focus on secondary-level language educators operating in under-resourced environments (LinkedIn, 2024; Palinkas et al., 2022). The study sample comprises 15 participants drawn from five public senior high schools, ensuring geographic and institutional diversity (Lincoln & Guba, 2021; Smith et al., 2023). Participants were selected through purposive sampling, a non-probability technique aimed at identifying individuals with first-hand experience of AI tool integration challenges 1,9. Criteria for selection included variations in age, teaching experience, and school type (e.g., urban-rural proximity, accreditation levels) to ensure a heterogeneous sample reflective of broader demographic patterns Creswell & Poth (2023). This strategy allowed the researchers to identify commonalities and divergences in teachers' experiences, enhancing the study's applicability to similar contexts (Creswell & Poth, 2023). By limiting the sample to 15 participants, the study prioritizes depth over breadth, adhering to recommendations for qualitative research where saturation defined as the point at which no new themes emerge is achieved through focused, intensive engagement with key informants (Creswell & Poth, 2023).

Data Collection

The study employed semi-structured interviews to gather in-depth insights into English teachers' experiences with AI-based tools in East Lombok. Interviews were conducted face-to-face or via video conferencing, depending on participant preference, and were audio-recorded with explicit consent. Each session lasted approximately 45–60 minutes, allowing flexibility in exploring emerging themes such as technical barriers, institutional support, and cultural resistance (Palinkas et al., 2022; Wolderslund et al., 2023). Recordings were transcribed verbatim to ensure accuracy, and pseudonyms were assigned to participants to protect anonymity (LinkedIn (2024; Van Bergen, 2022). In

addition to interviews, document analysis was conducted to contextualize teachers' narratives within broader institutional frameworks. Relevant documents included school ICT policies, lesson plans, and official reports on technology integration. These materials provided evidence of systemic constraints, such as outdated infrastructure and mismatched curricular priorities (Palinkas et al., 2022; Van Bergen, 2022). Document analysis followed a systematic coding protocol to identify patterns aligning with interview data, enhancing the study's credibility through triangulation (Lincoln & Guba, 2021).

Data Analysis

Data analysis was executed through thematic analysis, a method suited for identifying implicit and explicit patterns in qualitative datasets (Smith et al., 2023; Roldugin, 2023; Dilger, 2022). Transcribed interviews and document excerpts were imported into NVivo software to facilitate coding and theme development. Initial codes were generated inductively, reflecting participants' perspectives, before being clustered into broader themes such as "digital literacy gaps" and "policy-practice dissonance." This iterative process ensured alignment with the study's aim to foreground teacher voices rather than impose pre-existing theoretical constructs (Smith et al., 2023; Itzik & Walsh, 2023). To strengthen validity, triangulation was achieved via two strategies: member-checking and peer debriefing. Member-checking involved sharing preliminary findings with a subset of participants to confirm interpretative accuracy, while peer debriefing engaged independent researchers in reviewing coding decisions and thematic interpretations (Dilger, 2022; Itzik & Walsh, 2023). Discrepancies were resolved through consensus-building, minimizing researcher bias and enhancing the study's reflexivity (Creswell & Poth, 2023).

RESULTS AND DISCUSSION

Findings

The study explored the challenges faced by English teachers in East Lombok in adopting AI-based tools such as Grammarly and chatbots into classroom practices. Three major themes emerged from the analysis of interviews and supporting documents.

Technical Barriers

Teachers consistently reported limited access to stable internet connections and outdated hardware as the most pressing obstacles. In remote areas, frequent disruptions made it impossible to use AI tools consistently, and aging laptops or projectors often froze or failed when running applications. The lack of government funding for ICT infrastructure exacerbated these issues, leaving rural schools significantly behind their urban counterparts.

Pedagogical Challenges

A second theme centered on the lack of teacher training and professional development opportunities specific to AI integration. While most participants were aware of AI tools, they lacked the skills to adapt them to Indonesia's standardized curriculum. Workshops, when available, tended to emphasize basic ICT literacy rather than the practical customization of AI-driven platforms. As a result, teachers struggled to integrate AI meaningfully into lesson planning or classroom instruction.

Cultural Resistance

The third theme involved resistance rooted in traditional pedagogical practices and community expectations. Many teachers, particularly senior ones, viewed AI as disruptive to established methods, emphasizing that students learned best through direct explanation and practice. Institutional cultures that prioritized exam results over innovation reinforced this skepticism. Parents also tended to associate academic success with rote learning,

discouraging experimentation with new technologies. Together, these findings reveal that technical, pedagogical, and cultural barriers intersect to shape teacher experiences and limit AI adoption in rural East Lombok.

Discussion

The integration of AI-based tools into classroom practice, particularly in under-resourced regions such as East Lombok, illustrates the layered challenges of technological innovation in education. While AI has been heralded as a transformative force capable of enhancing personalization, reducing teacher workload, and providing adaptive learning environments, its adoption is neither uniform nor straightforward. Instead, infrastructural deficiencies, pedagogical preparedness, and cultural attitudes intersect in ways that constrain its potential. This study's findings contribute to the ongoing conversation about how global innovations in education manifest differently across local contexts, particularly those marked by inequality.

The results confirm the persistent reality of infrastructural inadequacies in rural schooling. Teachers in East Lombok described unstable internet access, outdated hardware, and limited institutional investment as barriers that directly hinder their capacity to integrate AI into their lessons. This aligns with the broader literature on the digital divide. Tahmasebi (2023) emphasizes that without reliable internet and functional devices, the promise of digital tools often remains theoretical, a point echoed by UNESCO's repeated warnings that educational technology risks amplifying inequality if structural deficits are not addressed. The East Lombok case, therefore, reflects a global pattern in which rural schools remain disadvantaged, both in terms of connectivity and technological resources.

Comparative work further underscores the disparity between rural and urban regions. Werfhorst et al. (2020) highlight how urban centers consistently receive greater allocations of technological resources, leaving rural regions underserved. This mirrors the Indonesian context, where urban schools in Jakarta and Surabaya report stable internet connectivity, modernized devices, and institutional partnerships with EdTech companies. The contrast is stark: while teachers in urban settings engage in professional development programs, collaborate with technology providers, and experiment with AI-driven pedagogies, their rural counterparts are left to navigate outdated infrastructure with little institutional backing. Similar inequities have been reported in sub-Saharan Africa and South Asia, where resource allocation favors urban centers, leaving rural students and teachers locked in cycles of disengagement and limited digital fluency (Kelly et al., 2022).

Yet, the problem is not only infrastructural. Pedagogical preparedness emerges as an equally significant challenge. Teachers in East Lombok are aware of AI-based tools such as Grammarly or chatbots, yet awareness alone does not translate into effective use. The findings reveal that educators lack systematic training that would allow them to adapt these technologies to the Indonesian curriculum. As Saimon et al. (2024) observe, teacher education programs often stop at the level of generic ICT skills without extending into AI-specific competencies. This results in underutilization, where teachers know that tools exist but cannot align them with lesson objectives or learning outcomes.

Comparisons with urban and higher education contexts reinforce this interpretation. In urban Indonesia, Wulandari et al. (2024) report that targeted training has significantly boosted teachers' confidence in using AI for grading, lesson planning, and adaptive feedback. Similarly, Avcı et al. (2019) highlight that structured, collaborative professional development allows teachers to integrate AI in ways that improve student engagement and outcomes. These studies suggest that the gap in East Lombok is not one of awareness but one of readiness—a distinction that challenges assumptions in the Technology Acceptance Model (TAM). TAM posits that perceived usefulness and ease of use are the primary determinants of adoption, but this study reveals that perceived usefulness may be

undermined not by teacher attitudes but by systemic gaps in training and contextual support.

The findings also bring cultural dynamics to the fore. Teacher resistance in East Lombok cannot be understood solely as reluctance to change. Instead, it reflects deeply rooted pedagogical traditions that prioritize hierarchical teacher-student relationships and emphasize examination performance. These cultural norms influence how educators perceive innovations like AI, which are associated with learner autonomy, experimentation, and blended learning. Research from Cambodia and Laos reveals similar skepticism, as teachers question whether AI tools align with established pedagogical paradigms (Ratri et al., 2024). East Lombok extends this discourse by showing how community expectations, particularly parental emphasis on rote learning, reinforce teacher resistance. The result is a socio-cultural ecosystem where tradition is valued over innovation, and where deviation from conventional methods is often met with suspicion.

This cultural resistance also resonates with global ethical debates about AI in education. Teachers expressed concerns about the depersonalization of learning and the risk of overreliance on automation, echoing the apprehensions documented by Mudawy (2024) and Yau et al. (2022). These critiques are important because they complicate the narrative of resistance as mere technophobia. Instead, they suggest that skepticism can be a form of critical engagement, a defense of educational values against technologies that may threaten interpersonal connection or critical thinking. Hoang (2020) frames such resistance as teacher agency, wherein educators act as guardians of pedagogical integrity. This interpretation expands TAM by incorporating socio-cultural variables: adoption is not simply about individual perceptions of utility but about how institutional inertia and community expectations mediate teacher decision-making.

Situating these findings within the broader literature highlights both points of confirmation and divergence. They confirm global accounts of the digital divide and teacher preparedness gaps while extending them by emphasizing the significance of community expectations in shaping educational choices. They also challenge overly universalist discourses in EdTech research, which often assume that technologies developed in urban or resource-rich contexts can be seamlessly transplanted to rural ones. As Polak et al. (2022) argue, digital transformation models must be contextualized, adapting to local realities rather than imposing standardized frameworks. East Lombok exemplifies this need for contextualization, where AI integration must align with cultural values, infrastructural realities, and teacher capacities.

The practical implications are considerable. First, infrastructural investment is indispensable. Without stable internet and reliable devices, even the most enthusiastic teachers are unable to utilize AI effectively. This finding resonates with Saidakhror (2024), who notes that institutions prioritizing technological infrastructure achieve higher rates of AI adoption. Investment, however, must be equitable, ensuring that rural regions receive the same opportunities as urban centers. Second, training must evolve beyond digital literacy. As Wood et al. (2021) suggest, AI literacy should be integrated into both pre-service and in-service training, equipping teachers not only with technical skills but also with the pedagogical frameworks to adapt AI tools to local curricula. In East Lombok, such training must be contextualized, focusing on how tools like Grammarly or chatbots can be adapted for large class sizes, limited resources, and exam-focused teaching.

Cultural resistance demands strategies of engagement rather than confrontation. Teachers and parents alike must be involved in conversations about the role of AI, emphasizing its complementarity with traditional methods. Yau et al. (2022) emphasize that acceptance is more likely when AI is framed as an aid rather than a replacement. This requires communication campaigns, pilot projects, and participatory approaches that show stakeholders how AI can enhance learning without eroding valued practices.

School leadership also plays a decisive role. As Bellibaş et al. (2022) note, principals who embody integrative leadership—balancing visionary, instructional, and distributed styles—create environments conducive to innovation. In East Lombok, leadership that prioritizes exam scores over experimentation has reinforced resistance. By contrast, leaders who embed AI integration into school development plans, allocate resources for training, and encourage collaborative experimentation can shift institutional culture. This leadership must also extend beyond schools, fostering partnerships with universities, NGOs, and EdTech firms that can provide expertise and bridge resource gaps (Vlist et al., 2024).

Perhaps the most unexpected finding is that many teachers in East Lombok expressed curiosity and awareness of AI tools despite infrastructural and pedagogical constraints. This contradicts global studies that attribute low adoption primarily to lack of awareness, underscoring the importance of distinguishing between awareness and readiness. Teachers are not ignorant of AI; they are constrained by systemic shortcomings that prevent them from translating curiosity into practice. Equally striking is the role of parental expectations. While most research focuses on institutional or teacher-level factors, this study highlights how community attitudes—particularly parental emphasis on rote learning—shape teacher choices. Education, in this sense, must be viewed as an ecosystem where multiple stakeholders exert influence.

The case of East Lombok demonstrates that AI adoption is not simply a question of technological innovation but of socio-technical negotiation. To move forward, strategies must address the intersecting barriers of infrastructure, pedagogy, and culture. This means equitable investment in rural digital infrastructure, systemic integration of AI literacy into teacher education, and culturally sensitive approaches that frame AI as an ally rather than an intruder. By centering teacher voices, this study underscores the importance of grounding global discourses in local realities.

The findings reinforce the view that AI in education is not a universal good that can be simply "plugged in" across contexts. Its adoption is shaped by the interplay of structural inequities, pedagogical preparedness, and cultural expectations. Confirming global concerns about the digital divide, extending the discourse on teacher preparedness, and highlighting the role of community norms, the East Lombok study contributes to a more nuanced understanding of how educational technologies are lived and negotiated in practice. By situating these localized voices within global debates, it challenges policymakers, scholars, and practitioners to rethink how AI can be meaningfully and equitably integrated into diverse educational systems.

CONCLUSION

This study reveals that barriers to AI integration in East Lombok's senior high schools are multifaceted, encompassing technical, institutional, and cultural dimensions. Technological limitations such as unstable internet connectivity, outdated hardware, and insufficient government funding—hinder teachers' ability to adopt AI tools effectively. These findings align with broader regional trends in Southeast Asia, where rural schools face systemic inequities in ICT infrastructure compared to urban counterparts. Institutionally, the absence of structured training programs exacerbates teachers' struggles to customize AI platforms like Grammarly or Duolingo for localized curricula, reflecting gaps in pre-service and in-service professional development systems. Culturally, entrenched preferences for traditional pedagogical methods and community scepticism toward technology-driven learning further impede adoption, underscoring the tension between global digital transformation narratives and rural educational values

The study contributes to both theoretical discourse and practical frameworks by proposing a context-sensitive model for AI adoption in under-resourced settings.

Theoretically, it extends the Technology Acceptance Model (TAM) to incorporate socio-cultural variables, emphasizing how community expectations and institutional inertia interact with technical constraints. Practically, the findings advocate for multi-stakeholder strategies, including government-led investments in digital infrastructure, school-based mentorship programs, and culturally responsive AI literacy campaigns. By prioritizing grassroots perspectives, this research offers actionable insights for policymakers aiming to bridge the urban-rural divide in EdTech integration while preserving pedagogical authenticity.

RECOMMENDATION

Short-Term Action: Launch immediate workshops to teach rural English teachers how to use basic AI tools (e.g., Grammarly, chatbots) for lesson planning. Train them to adapt AI-generated materials for their classes and troubleshoot technical challenges like offline use. Collaborate with universities, NGOs, and EdTech companies to provide expertise and resources. Offer mobile-friendly training modules to fit teachers' schedules.

Long-Term Action: Governments should fund rural internet upgrades and modernize school equipment in underserved areas (e.g., East Lombok). Steps include: 1) Allocating budgets specifically for broadband expansion and device upgrades, 2) Partnering with tech firms to create affordable AI tools for rural classrooms, dan 3) Including AI skills in teacher training programs to prepare future educators for tech-based teaching.

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