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An Investigation into In-service Teachers' Perceptions and Challenges of Using AI Tools in Lesson Planning

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Abstract:

The study explores how in-service teachers experience the growing use of AI tools in lesson planning, an area that remains insufficiently understood. Using a qualitative approach, open-ended questionnaires were collected from 15 secondary and higher secondary teachers across different subjects, and the responses were analysed thematically. Five themes emerged: AI as a limited assistant, the irreplaceable role of the teacher, challenges in prompting and usability, perceived cognitive shortcomings of AI, and the user's learning curve. Teachers appreciated AI's ability to reduce workload and assist with initial drafting, but emphasized that human judgment is essential for contextual accuracy, creativity, and meeting learner needs. Difficulties such as generic or culturally mismatched outputs, factual errors, and the need for strong prompting skills slowed adoption. The study concludes that professional development, context-aware AI design, and informed policy support are necessary to ensure AI strengthens rather than weakens teacher autonomy and instructional quality.

Keywords: *In-service teachers, Artificial Intelligence (AI) in education, Lesson planning, Teacher perceptions, Thematic analysis*

Introduction:

AI's rapid expansion has reshaped modern society, with education experiencing particularly significant transformation (Widianingtyas et al., 2023). Recognized as a foundational capability, AI is now embedded across educational technologies and widely accessible platforms (U.S. Department of Education, Office of Educational Technology, 2023). Policies such as India's National Education Policy 2020 reflect this global shift, emphasizing technology integration in teaching and learning and promoting AI as an essential subject for future-ready education. Within teaching workflows, large language models like ChatGPT and Copilot are creating substantial disruption and promise to

redefine established instructional routines (Nguyễn, 2024; Vadisetty, 2024; Widianingtyas et al., 2023). Existing research highlights AI's strong potential to support pedagogy and significantly reduce teacher workload by assisting with administrative and planning tasks (Belloula, 2025; Vadisetty, 2024). AI tools can rapidly generate educational materials, customize content, and produce detailed lesson plans tailored to learners' needs. Studies show that AI can help align learning activities with lesson objectives and serve as an effective brainstorming partner during planning (Nguyễn, 2024). Evidence also confirms substantial time savings, with reductions in hours spent on planning, searching resources, and reviewing student work (Clark & van Kessel, 2024). In some cases, teachers reported a 40 percent decrease in weekly planning time after adopting AI-based tools (Belloula, 2025). By handling routine processes, AI allows teachers to reclaim time for creative and higher-order instructional work. However, despite policy enthusiasm and documented advantages, a clear gap remains between anticipated benefits and the lived realities of classroom integration. In-service teachers continue to experience skepticism and hesitation, particularly around using AI for core instructional tasks like lesson planning (Kerr & Kim, 2025; Widianingtyas et al., 2023).

Research Objectives:

- To explore how in-service teachers perceive the use of AI tools in lesson planning practices.
- To investigate the challenges, they encounter while integrating AI into daily planning.

Significance of the Research:

Teacher who is currently employed in a school or educational institution and actively working in the profession living the daily chaos of classrooms. Because they are already embedded in real classroom settings, the integration of Artificial Intelligence (AI) into lesson planning directly affects them in ways no pre-service course ever prepares them for. Exploring their challenges and needs isn't just interesting; it's vital. They are the ones who must decide whether a shiny AI tool becomes a helpful assistant or just another burden. Moreover, in the contemporary educational landscape, the integration of technologies such as artificial intelligence has moved from novelty to necessity. Therefore, investigating how in-service teachers engage with, adopt, and adapt AI for lesson planning is timely: it aligns with the shifting demands of education.

The integration of AI tools creates contextual challenges in systems like India's NEP, which requires both technology use and cultural relevance (Ministry of Human Resource Development, Government of India, 2020). AI models trained on Western datasets often generate generic or culturally mismatched content (Belloula, 2025), forcing teachers to make heavy revisions. This reduces potential time savings and complicates adoption. To address these gaps, the study examines in-service teachers' lived experiences and practical challenges in using AI tools (Belloula, 2025).

Review of Related Literature:

Existing literature is characterized by a limited focus on the contextual and sustained

challenges faced by practicing professionals. Much current research offers only short-term evaluations, leaving the long-term impacts on teacher roles and institutional dynamics largely underexplored. Furthermore, studies often focus on specific regions or well-resourced environments, limiting the generalizability of findings to diverse or resource-limited educational settings. Specific, daily practical challenges for in-service teachers remain nuanced and complex. Teachers report concerns about developing over-reliance or over-dependency on AI-generated content, leading to a perceived diminution of their creativity in designing activities (Yunus Basha, 2024). Paradoxically, AI integration introduces new burdens, such as the time-consuming process of retyping detailed instructions or commands multiple times to ensure the AI output meets specific requirements.

Methodology:

Research design:

An exploratory, descriptive approach was used because the topic is still emerging and requires in-depth understanding rather than measurement

Sample Selection:

In-service teachers who are currently employed in school, that use AI for lesson planning have been selected for this study.

Sample Characteristics:

A total of 15 in-service teachers participated in the study, representing a diverse range of subject specializations and teaching contexts. Participants taught at different grade levels across the secondary and higher secondary stages, including subjects such as Hindi, English, Science, Mathematics, Social Science, Biology, and History. This distribution ensured that perspectives were drawn from teacher's thatuse AIfor lesson planning across multiple curriculum areas and student age groups.

Table- 1 Demographic Profile of Participating In-Service Teachers (N = 15)

Teacher ID	Subject Specialization	Classes Taught	Gender
T1	Hindi	6–10	F
T2	Hindi	6–10	M
T3	Science (Integrated)	6–10	F
T4	Science (Integrated)	6–10	M
T5	Biology	11–12	F
T6	Mathematics	6–10	M
T7	English	6–8	F
T8	English	6–8	F
T9	English	9–12	M
T10	Social Science	6–10	F

T11	History	11–12	M
T12	Computer/ICT	6–10	F
T13	Mathematics	9–12	F
T14	Science	9–10	M
T15	Physics	11–12	F

Data Collection Tool:

An open-ended questionnaire with five questions was used.The data were analysed using thematic analysis, following Braun and Clarke's (2006) process of systematically identifying, organizing, and interpreting recurring patterns within qualitative responses.

Analysis and Findings:

This thematic analysis is derived from the open-ended responses of in-service teachers regarding their experience using Artificial Intelligence (AI) tools, primarily ChatGPT, for lesson planning. The thematic analysis reveals five interconnected themes that describe how in-service teachers experience and interpret AI tools for lesson planning.

The first theme, **AI as a Bounded Assistant**, highlights teachers' perception of AI as helpful but fundamentally limited. AI is praised for reducing *"busy work,"* generating a *"rough draft,"* and handling formatting or administrative sections. Its usefulness is strongest when teachers *"already have a good idea of your objectives/activity sequence,"* and simply need coherent articulation. However, teachers repeatedly emphasise AI's lack of *"real creativity and original ideas,"* describing outputs as *"quite basic," "too generic,"* and producing the *"same kinds of lesson plans and same kinds of activities.*" This limitation is attributed to LLMs relying on *"predictive text,"* which produces the *"most likely"* rather than the most effective response. Despite this, AI can offer *"little nugget[s] of inspiration,"* generate quick examples, support gamification, design rubrics, and provide scaffolding questions.

The second theme, **The Critical Role of the Teacher**, underscores that human expertise remains essential. Teachers consistently state they *"still need to edit almost every AI suggestion,"* stressing that the AI-generated plan is only a starting point that *"you must make it yours."* This editing is crucial to fix factual errors, prevent *"hallucinations,"* and ensure accuracy. Teachers also highlight AI's inability to grasp contextual needs, noting that the *"curriculum is local,"* and AI outputs are often *"out of context for our students."* Challenges include mismatch with *"regional textbooks,"* cultural irrelevance, poor translations into languages like Hindi, and failure to account for diverse classrooms, *"mixed abilities,"* and realistic time constraints. Teachers caution against over-reliance, fearing that blind acceptance could make them *"lose sight of our role as the experts."*

The third theme, **Prompting and Paywalls**, captures the usability issues teachers face. High-quality output requires *"very detailed"* and successive prompts, creating a *"paradox"* where teachers feel

they "end up typing so much... it almost feels like doing it myself." Effective use depends on the teacher's own *"knowledge base,"* emphasising that *"AI tools as of today, are as good as the user."* Some teachers note that paid *"pro version[s]"* offer significantly better results than free models, indicating that capability is stratified behind subscription barriers.

The fourth theme, **Perceptions of AI's Cognitive Limitations**, reflects teachers' awareness that AI does not truly reason. They describe it as *"just an algorithm determining its decisions" and "not thinking, just doing."* This explains the lack of *"novel or nuanced"* content. Teachers acknowledge that AI produces grammatically polished text, but *"grammar objectively does not indicate good writing*." Most importantly, AI fails to understand instructional nuance or classroom diversity, often assuming that all students are *"top-scoring angels with the same learning speed," resulting in unrealistic, "fairytale*" outputs that remain inaccurate *"even after giving specific prompt."*

Finally, **The User's Learning Curve and Investment** highlights that effective AI use requires effort, time, and sometimes money. New users feel they initially *"wasting a lot of time,"* especially when demanding culturally relevant output. Mastery requires deliberate learning, building skill in prompting, and refining templates through *"successive prompts to revise."* Teachers note that creating a personalised master prompt and tweaking it over time improves results but requires meaningful upfront investment.

Discussion:

The thematic analysis provides critical empirical grounding for the perceived benefits and lived challenges of AI integration among in-service teachers, directly addressing the study's objectives.

The findings strongly validate the established literature regarding AI's capacity to enhance efficiency (Belloula, 2025; Clark & van Kessel, 2024). Themes such as AI as a Bounded Assistant confirm that educators value AI for reducing *"busy work,"* generating *"rough drafts,"* formatting content, and supporting administrative duties. This utility directly addresses the first research objective by confirming that teachers perceive AI as an effective tool for streamlining workload, thereby freeing up time for deeper pedagogical reflectiona shift noted in the responses regarding thinking more about student engagement and misconceptions. However, this perception of utility is strictly bounded. AI is viewed as an assistant, not an autonomous planner, validating claims that AI's best use is in supporting existing pedagogical ideas (Nguyễn, 2024).

The analysis simultaneously deepens the understanding of the persistent critical gap between policy enthusiasm and practical classroom integration (Kerr & Kim, 2025; Widianingtyas et al., 2023). The Critical Role of the Teacher theme reveals that the human educator acts as an indispensable filter. This necessity stems from the challenges highlighted in AI's Cognitive

Limitations, where content is frequently "too generic," lacks "real creativity," and demonstrates a profound inability to grasp contextual nuance or student diversity. This directly addresses the second research objective by detailing the challenges of contextualization. Teachers reported persistent issues with factual errors (hallucinations), cultural mismatch, and translation difficulties, particularly within the Indian educational context. For instance, the failure to align with "regional textbooks" or provide appropriate Hindi translations confirms the literature's prediction that models trained on broad, often Western-centric, datasets produce contextually irrelevant material that increases the workload for localization (Belloula, 2025). This essential vetting process underscores why a notable skepticism persists, as teachers resist the perceived diminution of their creativity and the loss of their role as the "expert" (Yunus Basha, 2024).

Finally, the theme The User's Learning Curve and Investment elucidates the practical burdens of adoption, expanding on the paradox of increased workload despite time-saving potential. Teachers reported that achieving quality output requires an extensive "knowledge base" and a significant investment in detailed, iterative "prompting." This struggle, where excessive typing makes the process feel like "doing it myself," reveals a new barrier to efficiency. Furthermore, the perceived stratification of quality between free and premium versions, as noted by some respondents, adds a layer of economic and access challenge. Collectively, these findings suggest that for AI to move from a novel aid to a core tool, educators must overcome a considerable learning curve, and the tools themselves must evolve to better handle localized curricula and cultural specificities.

Conclusion:

By foregrounding the voice and experience of in-service teachers, this research offers crucial information for educational stakeholders. The findings provide valuable insights for researchers seeking to optimize lesson planning processes using AI platforms. Furthermore, this study directly contribute to enhancing teacher professional development (CPD) programs by identifying the specific training required in areas such as prompt engineering and critical output evaluation to mitigate pitfalls like over-reliance. Ultimately, this research provides actionable insights to guide AI implementation strategies and education policy, ensuring that technological integration fosters a balanced approach where AI serves as a valuable supplement that complements, rather than diminishes or replaces, the teacher's central pedagogical expertise and critical thinking skills.

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