



Exploring High School EFL Teachers' Experiences with Magic School AI in Lesson Planning: Benefits and Insights

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Abstract

Advancements in artificial intelligence (AI) are reshaping education, yet its role in lesson planning warrants further exploration. This study examines how Indonesian high school English as a Foreign Language (EFL) teachers integrate MagicSchool AI, a generative AI tool, into lesson planning, revealing opportunities and challenges. Data from 38 teachers, collected through post-workshops open-ended questionnaires, and focus group interviews, highlight AI's dual potential: while it accelerates lesson planning, supports differentiated instruction, and fosters creativity, it also necessitates critical teacher oversight, effective prompt-engineering skills, and significant adaptation to align with classroom dynamics. Teachers emphasized AI's value in reducing workloads and generating diverse instructional ideas but noted that its outputs often lack readiness for immediate use, requiring refinement to ensure pedagogical soundness. These findings underscore the importance of targeted training and professional development to equip teachers with the skills to navigate AI tools effectively. This study emphasizes the critical balance between human expertise and technological efficiency by framing AI as a collaborative ally rather than a replacement for educators. It contributes to the growing discourse on AI in education, offering insights into optimizing human-AI collaboration for innovative, contextually relevant, and impactful teaching practices. This research invites educators and policymakers to envision AI as a transformative force, capable of bridging innovation with pedagogical integrity to shape the future of education.

Keywords: Artificial intelligence in Education (AIED), EFL, generative AI, lesson planning

INTRODUCTION

The rapid advancement and widespread adoption of artificial intelligence (AI) across various domains, including education, have sparked increasing interest among English Language Teaching (ELT) researchers in uncovering its multifaceted impacts. Although studies on AI in education remain limited, their numbers steadily rise. [Crompton and Burke](#)

(2023) observed a significant surge in AI-related publications between 2021 and 2022, with numbers doubling or tripling compared to previous years, solidifying AI in education (AIEd) as a prominent trend in recent educational research. These studies have explored diverse applications of AI in learning and teaching, ranging from tutoring to automated assessments. However, as González-Calatayud et al. (2021) noted, early studies up to 2020 largely emphasized technical aspects of AI, often neglecting the underlying pedagogical frameworks.

More recent research has shifted focus, exploring not only the practical implementation of AI but also addressing ethical considerations and integrity in its use (Flora, 2024; Sharadgah & Sa'di, 2022). For instance, Flora (2024) raised concerns about AI's potential to compromise academic integrity. Marzuki et al. (2023) highlighted its positive impact on students' EFL writing content and organization, albeit with noted challenges. The benefits of AI in education are widely acknowledged, particularly its ability to improve time efficiency in lesson planning and facilitate personalized learning experiences for diverse students (Jauhiainen & Guerra, 2023; Hasheem et al., 2024; van, 2023; Yilmaz, 2024). These findings underscore AI's transformative potential while emphasizing the need for critical and ethical integration into educational practices.

Lesson planning is a critical component of effective instruction, serving as a roadmap for achieving learning objectives. A well-crafted lesson plan includes objectives, instructional materials, activities, and assessments, often guided by national and local policies. Despite its importance, many teachers struggle to produce high-quality lesson plans, as observed in our workshops and teacher professional education programs (PPG). Common challenges include incoherence, excessive assessment demands, and poor-quality language inputs. These difficulties are not unique to Indonesia; Sharif et al. (2023) reported similar findings among Malaysian EFL teachers, suggesting the need for further support in lesson planning. The complexity of writing EFL lesson plans lies in addressing diverse student needs, balancing culturally appropriate pedagogy, and managing pressures like high-stakes testing (Loh & Liew, 2016).

Some previous studies have explored the use of AI in education, particularly in lesson planning, revealing its potential and challenges. Sharif et al. (2023), in their analysis of Malaysian EFL teachers, identified a moderate level of lesson planning competence and emphasized the need for additional support. Writing effective EFL lesson plans remains complex, requiring teachers to navigate culturally appropriate pedagogies, high-stakes testing pressures, and students' diverse language proficiency, interests, and motivations (Loh & Liew, 2016). Addressing these challenges, Octavio et al. (2024) found that ChatGPT significantly supported Spanish EFL teachers by streamlining lesson design and learner assessment, while Hasheem et al. (2024) highlighted its role in reducing planning time and mitigating burnout through tailored lesson creation. Yeh (2024) further demonstrated AI's adaptability in creating interactive and differentiated learning materials, which catered to diverse learner needs and enhanced teachers' professional competencies. However, these studies also underscore the critical need for prompt engineering and critical thinking skills to ensure the pedagogical relevance of AI-generated outputs (Karpouzis, 2024; Kehoe, 2023). This body of research highlights the promise of AI as a tool to address lesson planning complexities while reinforcing the importance of professional development to maximize its potential.

While previous studies have highlighted the potential of AI in education, particularly for lesson planning, several critical gaps remain. Much of the existing research, including works by [Sharif et al. \(2023\)](#) and [Yeh \(2024\)](#), focuses on general benefits such as time efficiency, adaptability, and workload reduction. However, these studies often neglect how AI integrates with specific pedagogical frameworks, particularly in diverse and underexplored teaching contexts. Furthermore, the emphasis on technical aspects, such as prompt engineering, frequently overlooks broader pedagogical and contextual challenges faced by teachers, especially in regions like Indonesia. While studies by [Octavio et al. \(2024\)](#) and [Hasheem et al. \(2024\)](#) highlight AI's utility in lesson planning, they provide limited insights into how teachers critically evaluate and adapt AI-generated materials to address learner diversity and dynamic classroom environments. Additionally, there is a lack of research on the long-term implications of AI use on teachers' professional development and its impact on student outcomes.

This study seeks to address these gaps by focusing on the integration of MagicSchool AI into lesson planning by Indonesian EFL teachers, a context that has received limited attention in AI education research. Unlike previous studies that prioritize technical functionalities, this research emphasizes the interplay between AI capabilities and teachers' pedagogical expertise. By examining how teachers critically evaluate and adapt AI-generated lesson materials to align with classroom needs and learner diversity, the study contributes novel insights into the practical application of AI in lesson planning. Furthermore, it explores the potential long-term effects of AI use on teachers' professional competencies and its role in enhancing student learning outcomes, bridging the gap between technical innovation and pedagogical soundness.

METHOD

Research Design

This study employed an exploratory case study design to investigate the experiences of 38 high school English as a Foreign Language (EFL) teachers in Central Java, Indonesia, as they integrated MagicSchool AI into their lesson planning. This approach was chosen because it allows for an in-depth examination of a relatively new and under-researched phenomenon, capturing the teachers' unique challenges, strategies, and perceptions within their specific educational and cultural context. Exploratory case studies are particularly valuable for understanding complex phenomena in real-life contexts, especially when the boundaries between the phenomenon and its context are unclear ([Yin, 2018](#); [Merriam & Tisdell, 2015](#)).

Participant Recruitment

Participants were recruited using convenience sampling, a method often employed in exploratory studies for its practicality in accessing willing respondents ([Etikan et al., 2016](#)). The target group comprised members of the district teacher forum (MGMP) with diverse teaching backgrounds, ranging from 5 to more than 15 years of experience. All participants held at least a bachelor's degree in English Education, with some having completed or pursuing a master's degree. Table 1 summarizes the demographic and professional profiles

of the respondents, illustrating a representative diversity in gender, teaching experience, and professional development engagement.

Table 1. Respondent's Identity

Gender	Male	Female
Educational Background		
S1	5	28
S2	1	4
Years of teaching		
5-7 years	1	3
7-10 years	3	21
10-13 years	2	4
13-15 years	0	1
More than 15 years	0	3
TPD Frequency		
Often	0	4
Sometimes	4	20
Rare	2	8

Data Collection

Data were collected through an online open-ended questionnaire and focus group interviews after a workshop on AI-assisted lesson planning. The questionnaire consisted of two parts: the first collected demographic and professional background information, while the second explored participants' experiences and reflections on using MagicSchool AI in lesson planning. Focus group interviews, a widely used qualitative method, provided more profound insights into participants' shared and individual experiences (Krueger & Casey, 2015). Three focal respondents were selected based on the following criteria: (1) representation of different gender groups, (2) variation in teaching experience, and (3) willingness and ability to articulate their experiences. The profiles of these focal respondents are presented in Table 2.

Table 2. Focal Respondents

Lea	Rosa	Tony
English Education, BA	English Education, BA	English Education, BA
15 years of teaching experience	5 years of teaching experience	More than 15 years of teaching experience
Frequently join TPD	Occasionally join TPD	Occasionally join TPD

Stimulated Recall Interviews (SRI) were integrated into the focus group sessions to enhance the depth of qualitative data. SRI has been recognized for its effectiveness in capturing participants' reflective thinking by revisiting specific events (Stough, 2001; Lyle, 2003). This method encouraged respondents to detail their cognitive and emotional processes during AI integration, offering a rich dataset for analysis.

Data Analysis

Thematic analysis was employed to analyze the collected data systematically, following established guidelines by Braun and Clarke (2006) and Miles et al. (2014). The process began with data immersion, involving repeated readings of transcripts to gain a comprehensive understanding of the content. Data condensation followed, removing irrelevant or redundant statements and paraphrasing key ideas for clarity. The first coding cycle used in-vivo coding, extracting keywords and phrases directly from participants' responses to preserve the authenticity of their perspectives. These codes were tabulated and clustered during the second coding cycle, where emerging patterns and themes were identified. Iterative clustering and evaluations ensured the reliability and validity of the identified themes.

FINDING AND DISCUSSION

The thematic analysis revealed four major themes representing the experiences of EFL high school teachers using MagicSchool AI in lesson planning: (1) time efficiency, (2) differentiation, (3) resourcefulness, and (4) challenges and lessons. These themes illustrate generative AI's dual potential and limitations in supporting teaching practices.

Time Efficiency in Material and Assessment Preparation

Time efficiency emerged as a significant theme in the experiences of EFL teachers using MagicSchool AI for lesson planning. The respondents highlighted how generative AI streamlined the process of creating instructional materials and assessments, reducing the time spent on traditionally labor-intensive tasks. For many teachers, the structured design of MagicSchool AI provided a user-friendly interface that simplified the workflow, especially compared to other AI tools like ChatGPT. However, the extent of these benefits varied based on individual familiarity with AI tools and contextual factors such as internet connectivity. The findings on time efficiency are summarized in Table 3, which categorizes respondents' insights into material preparation, assessment design, and the challenges faced. These categories offer a comprehensive overview of how MagicSchool AI-enhanced efficiency while highlighting teachers' limitations in specific contexts.

Table 3. Key Findings on Time Efficiency

Sub-theme	Respondent Insights	Key Insights
Time efficiency in material preparation	<ul style="list-style-type: none"> - Lea: Found MagicSchool AI faster than ChatGPT due to structured prompts; reduced holiday workload for material preparation. - Tony: First-time user; found the process intuitive and quick with pre-designed fields. 	MagicSchool AI significantly reduces material preparation time for teachers familiar with its structured fields.
Time efficiency in assessment design	<ul style="list-style-type: none"> - Malika: AI excels in generating diverse question types quickly. - Yaya: AI-generated assessments save time by providing varied difficulty levels. 	AI tools expedite assessment creation, particularly for generating varied and complex tasks.

Challenges in time efficiency	<ul style="list-style-type: none"> - Rosa: Requires follow-up prompting to refine outputs, reducing overall efficiency. - Saleh: Poor internet access makes AI impractical for rural areas. - Yasin: Limited connectivity increases time and costs for AI use. 	Challenges include poor internet access and additional time required for refining AI-generated outputs.
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Time efficiency emerged as a central theme in the experiences of teachers using MagicSchool AI for lesson planning, underscoring its potential to transform the traditionally labor-intensive process of creating instructional materials and assessments. This finding aligns with prior research emphasizing the role of generative AI in automating repetitive tasks, thereby freeing up teachers' time for more strategic and pedagogical work (Luckin et al., 2016; Popenici & Kerr, 2017). The respondents in this study largely acknowledged the tool's ability to streamline their workflows, particularly through structured prompts and intuitive interfaces. For example, Lea, a focal respondent, observed that MagicSchool AI reduced her holiday workload by providing a faster and more organized method of material preparation compared to her previous reliance on ChatGPT. *"It was faster for me to do prompting because basic guides for prompting are already provided."* This reflects findings by Huang (2023), who noted that AI-generated outlines offer a foundation for educators to build upon, emphasizing customization over starting from scratch.

The tool's effectiveness in assessment design was another prominent aspect of time efficiency. Respondents like Malika and Yaya highlighted how MagicSchool AI enabled them to generate diverse question types with varying difficulty levels quickly. *"AI excels in generating diverse question types quickly,"* noted Malika, while Yaya added, *"It saves time! I just prepare a good prompt and text, and the AI creates questions that cater to different skill levels."* These observations corroborate findings by Holmes et al. (2019), who argue that AI-driven tools enhance efficiency by automating complex processes, such as designing differentiated assessments. Furthermore, Floris et al. (2024) emphasize that while AI tools offer speed and variety, their outputs require alignment with specific pedagogical goals, reinforcing the need for teacher oversight.

Despite these advantages, significant challenges emerged, tempering the perceived efficiency of MagicSchool AI. Rosa pointed out that follow-up prompting was often necessary to refine AI-generated content, occasionally reducing the expected time-saving benefits: *"I often have to ask the AI to simplify the words, add details, or adjust the length. In the end, it is not as fast as I expected."* This challenge reflects broader limitations of generative AI tools, as highlighted by Tzirides et al. (2023), who caution that the quality of AI outputs depends highly on the specificity and clarity of user inputs. Additionally, teachers in rural areas, such as Saleh and Yasin, reported that poor internet connectivity hindered their ability to leverage the tool effectively. Saleh lamented, *"With limited internet access, working with AI takes too much time. It is easier to do things the traditional way."* At the same time, Yasin added, *"I have to go downtown for good internet access. But that means more time, more money, and more energy."* These findings resonate with the work of Sharadgah and Sa'di (2022), who

emphasize that infrastructural barriers can exacerbate the digital divide, limiting equitable access to AI tools.

From a pedagogical perspective, the respondents' experiences with MagicSchool AI highlight the evolving role of educators in integrating AI into lesson planning. While tools like MagicSchool AI streamline preparatory tasks, they also demand critical engagement from teachers to adapt and refine the generated content for specific classroom contexts. This duality supports the argument by Wang et al. (2024) that generative AI thrives when coupled with substantial human involvement, ensuring that the outputs are both pedagogically sound and contextually relevant. Furthermore, the requirement for follow-up prompting underscores the importance of teacher training in prompt engineering, as the ability to craft effective prompts directly impacts the quality of AI-generated materials (Kehoe, 2023; Floris et al., 2024).

The implications of these findings are significant, underscoring several critical areas for improvement and adaptation in the use of AI tools in education. First, they highlight the necessity of targeted professional development programs that equip teachers with the skills to optimize AI tools effectively. Such programs should address not only technical aspects, such as prompt engineering, but also focus on critical evaluation skills to ensure the pedagogical soundness of AI-generated outputs (Huang, 2023; Tzirides et al., 2023). Second, addressing systemic barriers, such as reliable internet access, is crucial to ensuring equitable access to these technological advancements, allowing all educators to benefit from the potential of generative AI. Finally, the findings emphasize a transformative shift in lesson planning practices, where generative AI tools act as collaborators, enhancing the educator's role rather than replacing their expertise. This aligns with the insights of Luckin et al. (2016), who argue that the integration of AI in education should support, rather than diminish, the creative and critical dimensions of teaching.

While MagicSchool AI demonstrates substantial time-saving benefits in lesson planning, its effectiveness hinges on multiple factors, including user proficiency, infrastructural support, and the adaptability of AI-generated outputs to specific classroom contexts. These findings contribute to the growing discourse on integrating AI in education, reinforcing the importance of a balanced partnership between technology and pedagogy. By recognizing both the opportunities and limitations of AI tools, educators can harness their potential to streamline processes and enhance efficiency while preserving the essential creative and critical elements of teaching.

Possible Differentiation

Beyond time efficiency in creating instructional materials and assessments, differentiation emerged as another prominent theme in the respondents' experiences with MagicSchool AI. Many teachers noted that the tool made it more feasible to level texts and tailor content to address the diverse needs of their students. Rosa, for instance, highlighted how MagicSchool AI-enabled her to create vocabulary-specific reading texts at varying levels of complexity, a task she had previously found almost impossible due to workload constraints. She explained:

"MagicSchool helps me create and vary reading texts based on the vocabulary that I want students to learn. I often used authentic materials, but some of my students cannot understand them. Also, sometimes the authentic texts do not contain the vocabulary that

I want to highlight. I like it when the tool not only uses the target vocabulary that I input but also allows me to create different levels of complexity. Yes, it takes two steps, but it's certainly something I knew I should do but had never done because it was so difficult." (Rosa, interview).

This insight aligns with [Holmes et al. \(2019\)](#), who argued that AI tools' ability to personalize content to meet individual learner needs enhances motivation and learning outcomes. Differentiation, as a pedagogical strategy, is particularly vital in classrooms with diverse student abilities and preferences ([Tomlinson, 2017](#)). MagicSchool AI facilitates this process by automating the creation of customized materials, allowing teachers to focus on refining their teaching approaches to support varied learner profiles.

Lea further elaborated on how Gen-AI enabled her to diversify her teaching activities, such as generating songs and jokes for use as icebreakers and engaging lesson introductions. *"I have learners with different learning styles and preferences, so varying ways of teaching and delivery, in addition to leveling the instructional material, are considered beneficial for my students,"* she stated. This practical application of Gen-AI reflects the growing emphasis on inclusivity in education, where technology supports teachers in addressing multiple learning modalities ([Heacox, 2012](#)). By leveraging AI, educators can cater to visual, auditory, and kinesthetic learners more effectively, enhancing overall classroom engagement.

These findings align with the broader capabilities of AI to foster personalized learning environments. [Shandu et al. \(2024\)](#) emphasized the adaptability of AI tools in tailoring educational content to meet the needs of individual learners, reducing the one-size-fits-all approach that often dominates traditional teaching. Moreover, [Yeh \(2024\)](#) highlighted that generative AI empowers teachers to create interactive and adaptive materials, which not only improve student engagement but also help teachers manage differentiated instruction with greater ease.

Incorporating differentiation through AI also addresses a key challenge in education: workload management. Teachers often struggle to implement differentiated strategies due to time and resource limitations ([VanTassel-Baska & Hubbard, 2016](#)). By automating tasks such as text leveling and content variation, MagicSchool AI reduces this burden, allowing educators to focus on higher-order instructional strategies. Rosa noted, *"It's something I knew I should do but had never done because it was so difficult. But using this AI, it's a lot easier."*

Furthermore, differentiation through AI reflects a broader shift in teaching practices, where technology bridges the gap between pedagogical challenges and innovation. The ability to adapt content to individual learners not only supports inclusivity but also aligns with the principles of Universal Design for Learning (UDL), which advocate for flexible and personalized approaches to teaching ([Nave, 2021](#)). Gen-AI enables teachers to create tailored content quickly, providing a more equitable and effective learning environment.

However, while Gen-AI's role in differentiation is promising, its effectiveness depends on teachers' ability to evaluate and adapt the generated outputs critically. As [Floris et al. \(2024\)](#) highlighted, the pedagogical soundness of AI-generated materials requires human oversight to ensure relevance and alignment with curriculum goals. This underscores the importance of professional development programs that equip educators with the skills to optimize AI tools effectively ([Sharadgah & Sa'di, 2022](#)).

MagicSchool AI has proven to be a critical enabler for differentiation, offering educators a practical means to address diverse student needs while managing their workload. Bridging technological innovation with pedagogical effectiveness supports dynamic, student-centered teaching methodologies that enhance motivation and learning outcomes. As generative AI continues to evolve, its role in fostering inclusivity and personalization in education will likely become even more integral.

Resourcefulness

After attending the workshop, all focal respondents reported utilizing MagicSchool AI multiple times to enhance their teaching practices. Rosa noted that while the tool provided interesting ideas for class activities, she often needed to adjust them to fit her students' specific needs. Similarly, Lea described how Gen-AI served as a valuable teaching resource, prompting her to revisit and implement instructional strategies she had not used since the early stages of her career. She reflected:

"I tend to be pragmatic in choosing the learning activities that are doable in class by considering my students' characteristics. AI provided some ideas that I think I can use. I have been teaching for more than 15 years now, and I think I got accustomed to using the same way to teach. I teach based on the book, asking students to do the exercises in the book. When I asked AI to create activities, I got some that I think I want to try. They are actually not new activities—I learned some of those back in my teacher training, but I think I have forgotten them and never really used them except in my early career as a teacher." (Lea, Interview)

Lea's experience underscores how AI tools can rejuvenate educators' instructional approaches by reintroducing previously learned but underutilized teaching methods. This phenomenon aligns with findings by [Urmeneta and Romero \(2024\)](#), who suggest that AI stimulates expansive learning by encouraging educators to revisit and adapt established pedagogical strategies. Additionally, AI-powered tools have been shown to enhance learning environments by providing diverse instructional resources and facilitating personalized learning experiences, supporting educators in delivering tailored and effective instruction ([Mishra et al., 2024](#)).

Integrating AI in educational contexts also empowers teachers by expanding their repertoire of instructional strategies. [Trust and Maloy \(2019\)](#) emphasize that digital tools like MagicSchool AI catalyze teacher innovation, allowing educators to break away from routine methods and explore more dynamic and engaging teaching approaches. Similarly, Rosa's observations reflect the flexibility of AI tools in adapting to specific classroom contexts. While she acknowledged the necessity of modifying AI-generated ideas, she found the suggestions invaluable as a foundation for designing tailored classroom activities. This adaptability mirrors findings by [Shandu et al. \(2024\)](#), who highlighted AI's role in generating diverse and contextually relevant resources, enabling teachers to address varied learning needs.

However, adopting AI requires critical engagement to balance technological efficiency with creative autonomy. [Mishra et al. \(2024\)](#) caution that while AI-generated content can inspire innovative teaching practices, educators must critically evaluate and refine these outputs to preserve authenticity and personalization. This sentiment echoes the

findings by Floris et al. (2024), who argue that AI tools can only complement teaching effectively when paired with human oversight to ensure pedagogical soundness.

MagicSchool AI has proven to be a valuable resource for enhancing teacher creativity and resourcefulness. By reintroducing forgotten strategies and generating new ideas, AI tools support educators in creating engaging and tailored learning experiences. However, their effectiveness hinges on educators' ability to critically adapt AI-generated content to align with students' unique needs and learning contexts. This collaborative dynamic between AI and teachers fosters a more innovative and adaptable teaching environment, positioning technology as a supportive ally rather than a replacement for human expertise.

Challenges and lessons

While generative AI tools like MagicSchool have demonstrated their potential to streamline lesson planning and inspire creativity, participants identified several challenges that must be addressed to optimize their effectiveness. These challenges, including the critical importance of precise prompting, the limitations of AI-generated outputs, and the essential role of teacher oversight, highlight the nuanced nature of AI integration in education. Respondents also emphasized that efficiency in lesson planning extends beyond time-saving to include producing high-quality, contextually appropriate materials. Table 4 summarizes these challenges and lessons, providing key respondent insights alongside actionable takeaways. This overview offers valuable guidance for educators and stakeholders aiming to harness the potential of AI tools while addressing their inherent limitations.

Table 4. Key Challenges and Lessons in Integrating AI Tools for Lesson Planning

Challenge/Lesson	Key Respondent Insights	Key Insights
Importance of Prompting	- Tony: "Writing lesson plans will be effective if we have the right prompt. Mastering prompting is key when we use AI."	Effective prompting ensures relevant and accurate AI outputs.
Limitations of AI Outputs	- Lea: Found some AI-generated texts unsuitable in vocabulary and complexity; editing required additional time. - Rosa: Needed to simplify or modify AI-generated outputs, adding to the workload.	AI-generated content often requires refinement to meet specific classroom needs.
Role of Teacher Oversight	- Rosa: "Teachers have to be flexible and adaptive toward class dynamics, something AI cannot cope with." - Lea: AI limitations forced her to revisit fundamental teaching principles.	Human oversight ensures alignment with pedagogical and contextual goals.
Efficiency Beyond Time-Saving	- Rosa: Redefined efficiency as the ability to produce quality materials, not just save time.	Efficiency extends beyond time-saving to producing high-quality materials.

Lessons for Effective Integration	- Kehoe (2023): Teachers must supplement AI outputs with their insights. - Wang et al. (2024): Generative AI thrives with human involvement and judgment.	AI integration requires training in critical evaluation and collaborative practices.
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Integrating generative AI tools like MagicSchool AI into lesson planning has opened new opportunities for efficiency and creativity. However, the findings reveal several challenges educators must navigate to optimize their use. Participants emphasized the importance of precise prompting, limitations in AI-generated outputs, and the critical role of teacher oversight, offering valuable insights into the dynamics of human-AI collaboration in education.

Prompting emerged as a fundamental skill for achieving effective results with AI tools. Tony highlighted that mastering prompting is essential, noting that *"writing lesson plans will be effective if and only if we have the right prompt. Mastering prompting is key when we use AI."* This sentiment aligns with the conclusions of Tzirides et al. (2023), Floris et al. (2024), and Mishra et al. (2024), who collectively emphasize that the quality of AI outputs is directly proportional to the quality of user inputs. Without precise prompts, AI-generated materials risk being vague, irrelevant, or impractical for classroom use. These findings reinforce the need for professional development programs that enhance educators' prompt engineering skills to ensure AI-generated materials meet pedagogical standards.

The findings also revealed limitations in the outputs generated by AI tools. Lea and Rosa expressed concerns about the suitability of vocabulary and contextualization in AI-generated texts. Lea explained, *"I still have to edit and sometimes replace all the generated text, and that takes a lot of time."* Similarly, Rosa noted the need to simplify or modify outputs to align with her students' needs. These challenges are consistent with insights from Kehoe (2023), Wang et al. (2024), and Holmes et al. (2019), who argue that while AI tools can expedite material creation, they often require significant refinement to address classroom diversity and contextual appropriateness. Such findings highlight the complementary role of AI and educators, where human oversight ensures that AI-generated content aligns with learning objectives and classroom realities.

Teacher oversight was another significant theme in the findings. Rosa emphasized that *"teachers have to be flexible and adaptive toward class dynamics, something AI cannot cope with."* This observation echoes the conclusions of Floris et al. (2024), Luckin et al. (2016), and Tzirides et al. (2023), who collectively underscore the indispensable role of educators in preserving the pedagogical and contextual integrity of AI-generated materials. By critically evaluating and adapting AI outputs, teachers ensure that the generated content meets the specific needs of their students and aligns with curriculum goals. Lea's reflection on AI limitations highlighted how these tools can prompt educators to revisit fundamental teaching principles, demonstrating the iterative and complementary relationship between AI and human expertise.

While efficiency was a key advantage of AI tools, the findings suggest that it extends beyond mere time-saving. Rosa redefined efficiency as the ability to produce quality materials within a reasonable timeframe, stating that *"the time efficiency definition is no*

longer limited to the quantitative amount of time to produce but the amount of time used to produce quality products." This perspective aligns with the work of [Luckin et al. \(2016\)](#), [Wang et al. \(2024\)](#), and [Urmeneta and Romero \(2024\)](#), who emphasize that actual efficiency in education involves creating impactful and contextually relevant teaching materials. AI tools like MagicSchool AI reduce the time required for initial material creation but demand additional effort from educators to refine and adapt these materials for optimal use.

The lessons from these findings underscore the importance of professional development programs that prepare teachers to use AI tools effectively. [Kehoe \(2023\)](#), [Wang et al. \(2024\)](#), and [Sharadgah and Sa'di \(2022\)](#) collectively highlight the need for teachers to supplement AI-generated content with their expertise to make informed pedagogical decisions. Professional development should focus on enhancing prompt engineering skills, fostering critical evaluation capabilities, and addressing ethical considerations in AI use. Such programs would ensure that teachers are not only proficient in using AI tools but are also equipped to integrate them into their pedagogical practices in a way that enhances educational outcomes.

The interplay between AI tools and teacher expertise raises critical questions about the balance between automation and human input in education. Over-reliance on AI risks diminishing creativity and critical thinking in lesson planning, as noted by participants and supported by [Tzirides et al. \(2023\)](#) and [Floris et al. \(2024\)](#). Future research should explore the optimal balance of human-AI collaboration, examining how educators can leverage AI to enhance teaching effectiveness while preserving essential human elements. Addressing systemic challenges, such as infrastructural limitations, is also crucial to ensure equitable access to AI tools, enabling educators in diverse contexts to benefit from technological advancements.

These findings highlight the transformative potential of AI in lesson planning while emphasizing the indispensable role of educators. By addressing limitations, refining integration strategies, and investing in teacher training, AI tools like MagicSchool AI can become powerful allies in education. However, their success relies on a balanced partnership between human expertise and technological innovation, ensuring that lesson planning remains efficient and pedagogically effective. This balance will ultimately create meaningful and impactful learning experiences guided by the collaborative efforts of educators and AI tools.

CONCLUSION

This study highlights the transformative potential of generative AI tools like MagicSchool in enhancing lesson planning and addressing the critical challenges they present. The findings reveal that effective AI integration requires precise prompting, significant teacher oversight, and adaptability to contextual classroom needs. While AI tools demonstrate clear advantages in streamlining material creation and offering diverse instructional ideas, their outputs often require refinement to meet pedagogical standards, underscoring the indispensable role of educators in maintaining quality and relevance. Notably, the concept of efficiency was reframed by respondents to emphasize the production of high-quality, contextually appropriate materials over mere time-saving. These insights underscore the need for professional development that equips teachers with

technical skills in prompt engineering and critical evaluation, fostering a balanced and effective human-AI partnership. By addressing these challenges, AI tools can be harnessed not as replacements for educators but as collaborative allies, enabling innovative, efficient, and impactful teaching practices. Future research should further explore optimal models for human-AI collaboration and strategies to ensure equitable access, particularly in resource-constrained educational contexts.

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