

Teachers' Perspectives on the Uses of AI Chatbots in Lesson Preparation: A Quantitative Study of Secondary School Teachers in Tabora, Tanzania

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Abstract

The study examined the extent to which secondary school teachers in Tabora, Tanzania, used AI chatbots in lesson preparation and their attitudes toward the effectiveness of these tools. The study was guided by Cognitive Load Theory (Sweller, 1988) in data analysis and discussion. Additionally, the study employed a quantitative descriptive survey that involved 150 teachers from 10 government secondary schools in the Tabora region, Tanzania. The study's findings revealed that teachers acknowledged the use and usefulness of AI chatbots in lesson preparation, which help save time, reduce workload, and enhance creativity. Also, teachers' attitudes towards the effectiveness of AI chatbots in enhancing lesson preparation were generally positive, with the majority strongly agreeing. However, concerns about the reliability and effectiveness of chatbot content were noted, suggesting cautious optimism. The study concludes that AI tools and chatbots, in particular, have significant support in lesson preparation. The study recommends establishing a policy on AI use in education and capacity building, and conducting further studies to explore the long-term effects of AI use in Tanzanian secondary schools.

Keywords: AI chatbots, Cognitive Load Theory, Teachers, Perceptions, Pedagogy, Secondary Schools

1.0 Introduction

Traditionally, teachers relied on printed books and notes to prepare lessons. These materials, which enabled teachers to prepare lessons, were physically available in libraries (provide source here). Currently, the rise of digital technologies has also shifted teaching practices to more sophisticated resources such as AI chatbots, e-books, and digital libraries (Jotangia, 2020; Adenariwo & Sulyman, 2022). In recent years, AI chatbots have been used to support teachers in lesson preparation, content delivery, and student support (Zhang et al., 2023; Labadze et al., 2023). In Tanzania in particular, the adoption of AI chatbots is increasing in secondary schools (Mbembati & Bakiri, 2025; Mambile & Mwogosi, 2025).

With advances in technology, including so-called Artificial Intelligence (AI), education and teaching practices have also undergone significant changes. The presence of AI-driven tools, in particular AI chatbots, has opened new ways for teachers to prepare lessons. The

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AI tools offer instant access to information, personal support, and cooperative guidance (Zhang et al., 2023). The tools are increasingly acknowledged for their potential to enhance creativity, efficiency, and pedagogical effectiveness in classroom instruction (Labadze et al., 2023).

Worldwide, AI tools such as chatbots have been embraced in education to help teachers generate teaching materials, design lesson plans, and provide instructional strategies (Ma et al., 2024). They can simulate human-like interfaces and provide more context-specific suggestions, making them valuable for supporting teachers' professional tasks. In Tanzania, most studies have largely centred on students' or learners' use of AI chatbots in higher education (Mbembati & Bakiri, 2025; Mambile & Mwogosi, 2025); little empirical evidence is available on how secondary school teachers engage with AI tools in their daily lesson preparation. This is particularly evident in regions like Tabora in Tanzania.

Although AI tools offer potential benefits, concerns remain about their ethical and pedagogical implications, particularly with AI chatbots. Overuse of these tools is reported to weaken users' creativity and their critical engagement with specific matters (Williams, 2024). Some scholars argue that over-reliance on AI tools may lead educators to focus on simpler, shorter content rather than developing reasonable, detailed, and original instructional materials (Williams, 2024; Zhai et al., 2024). Despite AI chatbots' ability to save users time and provide suitable answers to their needs, questions remain about their effectiveness in facilitating deep pedagogical outcomes and in sustaining professional autonomy in lesson preparation (Blahopoulou & Ortiz-Bonnin, 2025).

The current literature has explored the educational impact of AI tools across contexts such as social studies, language learning, and computer science (Yetişensoy & Karaduman, 2024; Shahriar, 2025). However, little attention has been paid to secondary school teachers' views, particularly in Tanzania, where the use of AI tools in teaching and learning remains limited (Sararikya & Kitula, 2024; Mollel, 2025). Therefore, this study focused on secondary school teachers in Tabora, Tanzania, with two objectives: to analyse the extent to which teachers use AI chatbots in lesson preparation, and to examine teachers' attitudes toward the effectiveness of AI chatbots in enhancing lesson preparation. Using a quantitative approach, this study sought to provide empirical insights into how teachers perceive and use AI chatbots and, ultimately, to contribute to the broader context of AI use in education in Tanzania.

2.0 Literature Review

2.1 AI Tools

The term AI stands for Artificial Intelligence, and AI tools are automated systems that interact with users, using language processing and machine learning techniques to mimic human-like responses (Kooli, 2023). Artificial Intelligence (AI) tools typically offer a range of services, including content generation, problem-solving, and decision-making. Among these tools, AI chatbots are prominent interactive systems that mimic human-like conversations and deliver instant responses to user inquiries. These tools generally use

Natural Language Processing (NLP) and machine learning to understand user inquiries, generate explanations, and offer customised suggestions. Moreover, AI chatbots are widely used to support diverse users because they can deliver quick, more contextualised responses, making them valuable tools (Williams, 2024; Zhai et al., 2024).

2.2 The use of AI Tools in Education

AI chatbots are applicable in different contexts, unlike other tools that are more specific. The uses of AI chatbots are evident, and currently, they have reshaped education (Chukwuere & Handoko, 2024). AI chatbots are sometimes considered pedagogical tools that exhibit features such as multimodality, conversational assistance, multilingual support, and seamless integration (Ilieva et al., 2023). Ortiz-Bonnin and Blahopoulou (2025) argue that AI chatbots help users generate learning materials, filter teaching and learning concepts, provide summaries of educational content, answer questions, produce essays, translate between languages, and offer many other services.

In addition, AI chatbots can serve as tutors, providing unlimited responses and lessons to users (Sedrakyan et al., 2024). Pickard-Jones et al. (2024) suggested that teachers who use AI tools to ask different questions and seek further clarification experience less cognitive load and demonstrate greater flexibility and a love for their work. Similarly, Lademann et al. (2025) found that AI chatbots can reduce intrinsic and extrinsic cognitive load among users while significantly enhancing positive attitudes and situational interest in the workplace.

Although some studies have reported the benefits of AI tools in education, ethical concerns, particularly overuse, can lead to academic dishonesty and warrant critical consideration. For example, when teachers use AI tools, they may be tempted to copy and paste chatbot-generated lesson plans and teaching materials without adapting them to their classroom context (King & ChatGPT, 2023). The risks of misuse can weaken teachers' critical thinking and pedagogical originality. Gerlich (2025) argued that users who rely heavily on AI chatbots demonstrate poor critical reflection in their practices. Moreover, Schulz and Knierim (2024) claimed that AI chatbots do not consistently reduce cognitive load compared with other internet searches, suggesting that their effectiveness may depend on how users incorporate them into their needs.

Furthermore, Bai et al. (2023) provided a balanced perspective, noting that AI chatbots offer meaningful benefits to users in education, including customised support and cognitive offloading. However, overuse can weaken cognitive abilities, including critical thinking and memory retention. Similarly, Schei et al. (2024), Stöhr et al. (2024), and Monib et al. (2025) reported that the use of AI chatbots can offer usefulness and motivational benefits to teachers, but can also result in shallow lesson design and reduced pedagogical depth.

2.3 Theoretical Framework

This study adopted the Cognitive Load Theory (CLT) by Sweller (1988), which provides valuable insights into the extent to which teachers use AI chatbots in lesson preparation. The theory differentiates intrinsic load, which reflects the complexity of the materials, from extraneous load, which arises from poor instructional design, and germane load, which involves efforts invested in schema construction (Sweller et al., 1998; Kirschner, 2002). In lesson preparation, teachers ought to balance their workload to ensure effective teaching.

Normally, AI chatbots can help reduce extraneous load through modernised information retrieval and access to organised content, while also helping manage the intrinsic load by simplifying complex topics. These insights align with the study's first objective, which sought to examine the extent to which teachers use AI chatbots in lesson preparation, as over-reliance on AI tools can indicate a shift toward improving lesson design and reducing cognitive load during preparation.

The second objective, which sought to analyse teachers' attitudes toward the effectiveness of AI chatbots in enhancing lesson preparation, has also informed the choice of the theory (CLT). The teachers' perceptions can be analysed in terms of germane load: whether AI chatbot use supports significant knowledge construction and effective pedagogical strategies, or merely encourages surface-level preparation. Similarly, Lademann et al. (2025) revealed that custom AI chatbots reduced intrinsic and extraneous load by improving teachers' positive emotions and self-efficacy. On the other hand, Gkintoni et al. (2025) argued that integrating AI tools with CLT enhances pedagogical effectiveness through customised support and automated cognitive load management. Therefore, these findings indicate that teachers not only use AI chatbots to simplify lesson preparation but also view them as effective tools for cognitively optimised lesson materials that align with CLT principles.

3.0 Methodology

The study employed a quantitative descriptive survey among 150 secondary school teachers in the Tabora region. The study was conducted in the Tabora region, which has a diverse mix of urban and peri-urban primary schools, making it a suitable context for examining disciplinary practices and their impact on academic performance, i.e., not AI usage in lesson plan preparations. Selecting Tabora aligns with the principle of contextual relevance, which emphasises choosing study areas that reflect the social and educational dynamics under investigation (Ahmad & Wilkins, 2025).

The 150 secondary school teachers were drawn from 10 government schools in the Tabora region. The sampled schools included Uyui Secondary School, Tabora Boys Secondary School, Tabora Girls Secondary School, Kiloleni Secondary School, Tuli Secondary School, Kitete Secondary School, Kazima Secondary School, Mabama Secondary School, Ntalikwa Secondary School, and Isevyia Secondary School. The researcher selected schools from different areas to ensure that the findings capture a range of teaching environments and practices across the region.

The selection of 150 teachers provides a relatively large and representative sample; however, it remains manageable for data collection and analysis. Although gender was not the study's central concern, gender balance was considered to reflect the representativeness of male and female teachers, strengthen validity, avoid bias in interpreting attitudes toward AI chatbots, and, finally, enhance the generalizability of the results. Convenience sampling was used because participants were accessible and willing (Etikan et al., 2016). The study's data were collected through structured questionnaires covering participants' demographic information, frequency of AI chatbot use, purposes of use (e.g., lesson preparation), and

perceptions of AI chatbot use. Participants' responses were analysed using descriptive statistics. Reliability was confirmed with Cronbach's alpha, exceeding 0.90 for all constructs. This helped summarise teachers' responses regarding the frequency of AI chatbot use and their perceptions.

The content validity of the questionnaires was confirmed through expert review by four specialists in the field, who evaluated relevance, clarity, flow, and comprehensiveness. Reliability analysis using Cronbach's alpha indicated excellent internal consistency for all constructs: perceptions of how AI chatbots reduce intrinsic cognitive load ($\alpha = 0.94465$), perceptions of how chatbots reduce extraneous cognitive load ($\alpha = 0.92218$), and perceptions of how AI chatbots increase germane load ($\alpha = 0.94226$), all exceeding the 0.70 benchmark. The researcher ensured that a research permit and approval from the regional, district, and school administrations were obtained before proceeding with the study. Furthermore, participants were free to choose whether to participate, and they were assured of privacy.

4.0 Results and Discussion

4.1 Demographic Data of the Respondents

A total of 150 secondary school teachers participated, selected from 10 government schools in the Tabora region. The sampled schools included Uyui Secondary School, Tabora Boys' Secondary School, Tabora Girls' Secondary School, Kiloleni Secondary School, Tuli Secondary School, Kitete Secondary School, Kazima Secondary School, Mabama Secondary School, Ntalikwa Secondary School, and Isevyu Secondary School. Their demographic information is presented as follows in Table 1:

Table 4.1: Demographic Information of the Respondents (N = 150)

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	75	50%
	Female	75	50%
Working Experience	More than 5 years	150	100%
Educational Level	Bachelor's Degree	150	100%

Source: Field Data, 2026

Table 4.1 above provides demographic information on the secondary school teachers who contributed their views to the study. A total of 150 respondents (secondary school teachers) were selected from the 10 government secondary schools mentioned above in the Tabora region. The gender distribution is representative: 75 male teachers (50%) and 75 female teachers (50%). An equal number of male and female respondents was intentionally maintained to ensure equal representation of perspectives, as gender has been shown to affect teachers' adoption of educational practices (Machemba & Biswal, 2025). Regarding educational qualifications, all respondents reported possessing a bachelor's degree and more than 5 years of work experience. Teachers with a bachelor's degree and more than 5

years of work experience are often considered to have advanced training and experience in pedagogy. This helps them possess a variety of teaching practices, including knowledge of AI use (Ministry of Education, 2014). Also, the study was motivated by the need to ensure that respondents had sufficient academic background to assess the potential of AI tools (Luhwera, 2024). Regarding work experience, every participant had more than 5 years of teaching experience, which was considered essential for capturing insights from seasoned professionals with established pedagogical practices who can critically assess the integration of AI chatbots into lesson preparation (Machemba & Biswal, 2025). Finally, the involvement of teachers from various schools in the region (Tabora) ensured that varied viewpoints across different secondary school contexts were presented, thereby enabling the generalizability of the findings from the respondents to the expansive Tabora region.

4.2 The Extent to which Secondary School Teachers in Tabora Use AI Chatbots in Lesson Preparation

This study was guided by two objectives: the first objective focused on exploring the extent to which secondary school teachers in Tabora use AI chatbots in lesson preparation. Table 4.2 presents the findings from respondents.

Table 4.2: Extent to which Secondary School Teachers in Tabora Use AI Chatbots in Lesson Preparation

No	Item	Strongly Agree	Agree	Strongly Disagree	Disagree
1	Have you ever heard of AI chatbots used in education, e.g., ChatGPT, Gemini, Microsoft Copilot, etc.	150 (100%)	-	-	-
2	Do you use AI chatbots when you prepare teaching materials	120 (80%)	3 (2%)	12 (8%)	15 (10%)
3	Do you frequently (daily) use AI chatbots when you prepare teaching materials	90 (60%)	45 (30%)	5 (3.3%)	10 (6.7%)
4	Do you rarely use AI chatbots when you prepare teaching materials	10 (6.7%)	5 (3.3%)	126 (84%)	9 (6%)

Source: Field Data, 2026

The results in Table 4.2 above reveal that all the respondents strongly agreed that they have heard of AI Chatbots used in education. In addition, the respondents' findings suggest that the majority strongly agreed or agreed that they frequently/always use AI chatbots when preparing lessons. These findings align with the Cognitive Load Theory (CLT), which emphasises reducing extraneous cognitive load to allow teachers to focus on essential instructional processes and content (Sweller, 1988). With AI Chatbots, teachers can simplify routine tasks such as preparing lesson plans and teaching materials, reducing redundant cognitive demands and stress, and allowing them to direct more mental energy toward creativity and pedagogical practices.

These findings align with those of Luhwera (2024), who examined AI chatbot use at Tanzania Public Service College and found that learners use AI chatbots to make difficult

concepts and complex tasks easier in their studies; however, there remains a concern about reduced learning outcomes. Also, the National Guideline for Artificial Intelligence in education (2025) emphasises that AI-related tools can improve the efficiency of teaching and learning, but they must be used responsibly to avoid undermining an individual's critical thinking and judgment (MoEST, 2025).

Apart from studies in Tanzania, some studies conducted in Africa and globally also align with these insights. The study by Machemba and Biswal (2025) revealed that AI-related tools in Tanzanian schools have improved teaching and learning effectiveness, but their use should be moderate to avoid overuse or overdependence. Similarly, some global studies, for instance, the study by Holmes et al. (2022), have revealed that the use of AI tools in education can significantly reduce teachers' workload; however, they may, by chance, increase extraneous load when the AI tools offer inaccurate, overly simplified, or overly complex outputs.

Although the findings on the extent to which teachers' use of AI chatbots affirms their significant contribution to reducing workload and enhancing lesson preparation, CLT reminds us that the tools are used to lower cognitive load among teachers rather than to introduce new complexities. Despite relatively low chatbot accuracy, teachers recognise the efficiency gains from AI tools; however, they remain cautious about trustworthiness. This instance suggests that the effective use of AI chatbots must include technical support for teachers and instructions to align with CLT's principle of adjusting cognitive load for significant learning and teaching.

4.3 Secondary School Teachers' Attitudes toward the Effectiveness of AI Chatbots in Enhancing Lesson Preparation

The study's second objective focused on analysing secondary school teachers' attitudes toward the effectiveness of AI chatbots in enhancing lesson preparation. Table 4.3 presents the findings from respondents.

Table 4.3: Secondary School Teachers' Attitudes toward the Effectiveness of AI Chatbots in Enhancing Lesson Preparation

No	Item	Strongly Agree	Agree	Strongly Disagree	Disagree
i.	AI chatbots make lesson preparation more efficient	85 (56.7%)	50 (33.3%)	5 (3.3%)	10 (6.7%)
ii.	AI chatbots improve the quality of teaching materials	80 (53.3%)	55 (36.7%)	5 (3.3%)	10 (6.7%)
iii.	AI chatbots enhance creativity in lesson planning	75 (50.0%)	55 (36.7%)	10 (6.7%)	10 (6.7%)
iv.	AI chatbots support differentiated instruction for diverse learners	70 (46.7%)	60 (40.0%)	10 (6.7%)	10 (6.7%)
v.	AI chatbots are effective in preparing assessments	65 (43.3%)	55 (36.7%)	15 (10.0%)	15 (10.0%)
vi.	AI chatbots increase student engagement through interactive lessons	80 (53.3%)	55 (36.7%)	5 (3.3%)	10 (6.7%)
vii.	AI chatbots reduce preparation stress for teachers	90 (60.0%)	45 (30.0%)	5 (3.3%)	10 (6.7%)
viii.	AI chatbots are reliable for lesson preparation	70 (46.7%)	55 (36.7%)	15 (10.0%)	10 (6.7%)

Source: Field Data, 2026

The findings in Table 4.3 indicate that teachers have positive attitudes toward the effectiveness of AI chatbots for lesson preparation. From the findings, the majority of respondents (over 75%) strongly agree or agree that AI chatbots enhance creativity, reduce stress, and improve efficiency. Their responses indicate that the teachers consider AI chatbots essential technological tools for lesson preparation, particularly for quickly generating lesson plans, saving time, and facilitating students' engagement. These findings align with Cognitive Load Theory (Sweller, 1988), which suggests that AI chatbots reduce extraneous cognitive load by mechanising routine educational tasks, allowing teachers to focus on other essential instructional practices. Similarly, some studies in Tanzania (e.g., Luhwera, 2024; Machemba & Biswal, 2025) have shown that AI-related tools are considered effective, improving and streamlining teaching and learning; however, concerns about trustworthiness and accuracy remain. Moreover, some global studies, for example, Holmes et al. (2022), have also revealed that although AI-related tools reduce users' workload, their efficiency depends on how carefully users integrate them to avoid inefficiency. Hence, the Tabora teachers' attitudes toward AI chatbots reflect vigilant optimism. Generally, the findings indicated that the teachers recognise the potential benefits of AI chatbots in enhancing lesson preparation.

5.0 Conclusion

The study examined the extent to which secondary school teachers in Tabora use AI chatbots for lesson preparation and their attitudes towards the effectiveness of these tools. Overall, the findings indicate that teachers recognise the frequent use of AI chatbots and their effectiveness in reducing workload, enhancing creativity, and saving time during lesson preparation. These findings align with Cognitive Load Theory (Sweller, 1988), which emphasises minimising cognitive demands to allow teachers to focus on other instructional practices. Teachers' attitudes were generally positive, with strong agreement that AI chatbots improve time management, efficiency, and the quality of teaching materials. However, concerns were noted about the reliability of content provided by AI chatbots and their effectiveness in lessons and assessments. Overall, the study's findings demonstrate that teachers frequently use AI chatbots to support lesson preparation; however, their use must be carefully managed to ensure content accuracy and learning outcomes.

6.0 Recommendations

Based on the objectives of the two studies, it is recommended that the Ministry of Education (MoE), teacher-training institutions, and school administrators prioritise the controlled use of AI chatbots for lesson preparation. Teachers should be provided with ongoing training programmes to strengthen their ability to critically evaluate and adapt to AI tools, particularly AI chatbot outputs, ensuring that these tools genuinely and significantly reduce workload and enhance creativity among secondary school teachers without compromising accuracy. In addition, clear policies and guidelines must be established to regulate the use of AI tools in schools, with quality assurance strategies to monitor the reliability and validity of AI-generated content. Furthermore, teachers should be encouraged to adopt a balanced approach, using AI chatbots as supplementary tools rather than as replacements for non-AI sources in lesson preparation. Finally, it is recommended that further studies across different regions of Tanzania be conducted to assess potential long-term effects and refine strategies for effective AI use in education.

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