Cultural Influences on Teachers' Attitudes towards AI Integration: A Case Study of Katoba Secondary School in Chongwe District, Zambia

Natalia Zulu
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: nmbambo@zut.edu.zm

Simon Banda
School of Business, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: sbanda@zut.edu.zm

Calvin Silwizya
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: csilwizya@zut.edu.zm

John Pamba
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: jpamba@zut.edu.zm

Betty Bweupe
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: bbweupe@zut.edu.zm

Gabriel Musonda
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: gmusonda@zut.edu.zm

Sam Kasele Mukuka
School of ICT, Zambia University College of Technology, Ndola, 10101, Zambia
E-mail: smukuka@zut.edu.zm

Abstract - This qualitative case study, guided by the Diffusion of Innovations (DOI) Theory and underpinned by an interpretivist paradigm, aimed to explore the multifaceted cultural influences on teachers' attitudes towards Artificial Intelligence (AI) integration at Katoba Secondary School in Chongwe District, Zambia. With a sample size of 8 participants, the study delved **into how their beliefs, including pedagogical views and trust in technology,** shaped **their initial perceptions of AI as an educational tool. Furthermore, it investigated how teachers' privacy values, influenced by local socio-cultural norms, affected their readiness to adopt and integrate AI technologies into their instructional practices. Finally, the research examined how current professional development methods and school-level cultural practices either facilitated or hindered the successful integration of AI tools into daily classroom routines. The study revealed how teachers' deeply held pedagogical beliefs, privacy values, and the effectiveness of professional development and school-level cultural practices collectively served as either enablers or barriers to the successful integration of AI tools into their daily instructional routines. These crucial insights informed culturally responsive policies, curriculum development, and professional development strategies for fostering effective AI integration in Zambian education and comparable sub-Saharan African contexts.**

Keywords: Cultural Influences, AI Integration, Teachers' Attitudes, Values, Pedagogical Beliefs.

INTRODUCTION AND BACKGROUND

Artificial intelligence (AI) is increasingly being adopted in educational contexts globally, promising transformative benefits such as personalized learning, intelligent tutoring systems, and enhanced instructional efficiency[1]. The successful integration of these technologies, however, depends not only on technological readiness but also, and perhaps more critically, on educators' beliefs, trust, cultural values, and institutional support. AI in this context refers to the use of intelligent systems, including machine learning algorithms, natural language processing, and data analytics, to support instructional decision-making and automate administrative tasks [2],[3]. While these technologies hold significant promise, their effective adoption in schools is heavily influenced by the attitudes of teachers, who are central to the implementation process.

Teachers' attitudes, in this context, refer to their beliefs, feelings, and predispositions toward using AI tools in their professional practice [4]. These attitudes are not formed in isolation; rather, they are shaped by broader cultural influences, including shared beliefs, values, norms, and practices within a specific social or institutional context [5]. For this study, culture is defined as a system of collective meaning that influences how individuals perceive and respond to technological innovations. AI integration is the process of embedding AI tools and practices into existing teaching and learning environments in a meaningful and sustained manner.

This research focuses on Katoba Secondary School, a rural school in Chongwe District, Zambia. The school was specifically chosen for this study because it has been designated by the Zambian government as a pilot

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school for AI education, with the aim of transforming it into an AI Centre of Excellence [6]. This unique status makes it a critical site for exploring how cultural factors shape teachers' attitudes toward AI integration from the outset of a major governmental initiative.

LITERATURE REVIEW

The integration of Artificial Intelligence (AI) technologies is fundamentally reshaping global educational landscapes, offering significant potential to enhance personalized learning, automate administrative tasks, and support data-driven decision-making [2],[7]. While much scholarly attention has focused on the technological affordances of AI, the influence of cultural and contextual factors on teachers' attitudes and acceptance in specific educational settings remains underexplored [8]. In many developing countries, including those in sub-Saharan Africa, the implementation of AI tools is complicated by challenges such as infrastructure limitations, low digital literacy, and cultural resistance [9].

Zambia's National Artificial Intelligence Strategy [6] offers a critical policy backdrop for understanding institutional and cultural readiness for AI integration in education. The strategy outlines the government's intention to embed AI across key sectors, particularly education, by integrating AI and digital skills into curricula at all levels, fostering AI literacy, and supporting professional development initiatives tailored to Zambian educators [6].

1. Socio-Cultural and Pedagogical Beliefs

Studies from diverse contexts highlight the interplay between culture, beliefs, and technology adoption. For instance, a study in Korea found that students' attitudes toward AI were influenced by gender, socio-cultural challenges, and prior exposure to AI-related education [10]. Similarly, a study in Nigeria showed that socio-cultural norms and technological accessibility shaped student engagement with generative AI, with a lack of technical support and inadequate infrastructure acting as barriers [11].

The Zambian context mirrors these findings. At Katoba Secondary School, teachers held positive perceptions of AI's potential to modernize instruction and improve student motivation. However, they also identified infrastructural challenges, such as poor internet connectivity and inadequate digital resources, as significant obstacles to integration [12]. These findings are consistent with recent research on AI in Zambia's education sector, which raises critical questions about whether the country's infrastructural and ethical limitations make AI adoption premature [13].

2. AI Literacy and Teacher Attitudes

AI literacy is a key determinant of positive teacher attitudes toward AI integration. A study in Turkey revealed that teachers with higher levels of AI literacy, particularly those with graduate-level education, were significantly more positive about AI integration [14]. In the UK, teachers' acceptance of AI tools was influenced by their familiarity with AI and their understanding of pedagogical integration frameworks [15].

These trends are also evident in the Zambian context. Low digital literacy among educators was found to hinder the successful adoption of ICT and AI tools, underscoring the need for enhanced professional development [16]. This aligns with findings in Nigeria, where many teachers showed negative attitudes toward AI due to fears of job loss, lack of technological confidence, and insufficient academic preparation [17].

3. Infrastructure, Policy, and Institutional Support

The success of AI integration is heavily dependent on the availability of supportive infrastructure and institutional frameworks. In Zambia, the lack of adequate ICT resources, inconsistent internet access, and insufficient training were identified as key obstacles to implementation [18]. These concerns are echoed in other studies, such as one from Nigeria where teachers called for better awareness campaigns, inclusive policies, and training programs to promote understanding of AI's role in education [17].

The need for capacity building was also highlighted in the UK and Greece, where teachers indicated that access to training and institutional support greatly enhanced their confidence in using AI tools [15],[18]. This reinforces the finding that effective AI integration is not just a technical endeavor but a deeply cultural and pedagogical process that requires robust infrastructure and a supportive institutional environment.

Ultimately, while existing literature provides a foundational understanding of the factors influencing AI integration in education, a significant research gap remains. The literature lacks in-depth, localized studies that specifically explore how the unique socio-cultural and pedagogical beliefs of teachers in a

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Zambian context, such as those at Katoba Secondary School, shape their perceptions of AI. There is also a distinct absence of research that directly links local privacy values to teachers' readiness to adopt these technologies. Furthermore, while the need for professional development is well documented, a critical gap exists in evaluating what constitutes culturally responsive and effective professional development within the Zambian educational landscape. The present study is designed to bridge these gaps by providing a nuanced, qualitative examination of these issues, thereby offering culturally informed insights that can guide the development of context-specific AI integration strategies in Zambia and other comparable settings.

RESEARCH PROBLEM AND RESEARCH OBJECTIVES

The increasing integration of artificial intelligence (AI) into various sectors has prompted an inquiry into its potential role in educational settings. While AI offers promising solutions for enhancing teaching methodologies [2],[7], a significant gap exists in understanding the perceptions, concerns, and readiness of educators regarding its adoption [19]. The problem this research addresses is the lack of empirical data on how educators perceive AI as a pedagogical tool, the specific privacy and ethical concerns they hold [11], [20], [21], and the institutional and policy-level support required for successful integration [17], [22]. This gap in knowledge creates a challenge for developing effective and contextually relevant strategies for AI implementation in schools. This problem is of particular national importance as it directly hinders the achievement of Zambia's strategic educational goals, as pronounced in documents such as the "Educating Our Future" policy [23] and the "Zambia 2024-2029 Partnership Compact" [24]. These national frameworks prioritize the enhancement of inclusive and quality teaching and learning, aiming to produce a technologically adept, innovative, and analytical learner. The lack of a clear understanding of educators' readiness and concerns thus hinders the development of a coherent national strategy to leverage AI in support of these vital objectives.

Therefore, this paper sought to address the following research objectives:

1. To evaluate how teachers' beliefs at Katoba Secondary School in Chongwe District influence their initial perceptions of AI as an educational tool.
2. To determine how teachers' privacy values at Katoba Secondary School influence their readiness to adopt and integrate AI technologies into their instructional practices.
3. To examine how current professional development methods and school-level cultural practices at Katoba Secondary School in Chongwe District influence teachers' successful integration of AI tools into their daily instruction.

THEORETICAL UNDERPINNING: DIFFUSION OF INNOVATIONS (DOI) THEORY

The theoretical framework for this study is the Diffusion of Innovations (DOI) theory, as proposed by Everett M. Rogers [25]. The innovation is the integration of AI tools into classroom instruction at Katoba Secondary School. The research examines how teachers at the school perceive AI based on these attributes. The Social System element of the Diffusion of Innovations theory refers to the interconnected individuals or organizations that collectively accept or reject an innovation [25]. In this study, the teachers at Katoba Secondary School constitute the social system, making this a central element of the research, as it directly addresses the focus on "Cultural Influences."

RESEARCH METHODOLOGY

This study employed a qualitative approach with a case study design to explore the cultural influences on teachers' attitudes toward AI integration. Guided by an interpretivist paradigm, this design was selected to provide an in-depth understanding of the complex social and cultural phenomena at a single site [26]. The research was conducted at Katoba Secondary School in Chongwe District, Zambia. A total of 10 participants were selected using a purposive sampling technique. The sample composed of six teachers and four members of the school administration, which included the Head of Department, Deputy Head Teacher, and Head Teacher. Data were collected through semi-structured interviews and data saturation was reached at the eighth participant. The collected data were transcribed and then analyzed using thematic analysis. Throughout the study, all ethical guidelines were strictly adhered to.

RESULTS AND DISCUSSION

The collected data reveals a mixed but generally optimistic view among educators regarding the integration of AI in the classroom. Key findings are grouped into three main areas thus perceptions on the integration of AI, concerns about privacy and data

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security as they use AI and readiness and recommendation for adoption of AI. These areas are further presented in tables 1, 2 and 3.

Table : 1
Perceptions on Integrating AI

Themes	*supporting quotes*
AI as a Tool to Ease Workload	*Participant 1: "AI can be aligned in these approaches to give learners more time to learn on their own."* *Participant 2: "AI is very critical as it has lessened teachers' workload in terms of lesson planning..."* *Participant 3: "The current teaching approach with AI is easier than the old ones, in fact it is time saving and provides deep or in depth, levels of content."* *Participant 6: "It provides students with interactive and engaging learning experiences. It enhances teaching effectiveness and experiences, personalizes learning and improve learners outcomes."* *Participant 7: "AI will blend well with the current teaching approach in that it will bring in the aspect of concretization in the mind of the learner."*
Concerns about AI's Impact on Learning	*Participant 8: "I have a feeling that the majority of learners might be lazy in terms of handling paper work or books at an early age."*
Willingness to Trust AI	*Participant 3: "To a greater level or extent because we live in a busy world and burying oneself in too much work is not good when we know that AI can do it with ease at any time."* *Participant 4: "I trust AI 90%. It is better to experiment with AI because the teacher is not always in the classroom but AI* *Participant 7: "New technology helps to make work easy, hence trusting it at 95%."*

Source: Research Data 2025

The qualitative findings in table 1 on teachers' perceptions of AI integration at Katoba Secondary School reveal nuanced attitudes that resonate with established literature and the Diffusion of Innovations (DOI) Theory. The teachers' views on AI as a tool to ease workload, their concerns about its impact on learning, and their willingness to trust the technology are central to understanding their readiness for adoption as explained in the preceding paragraphs.

A. AI as a Tool to Ease Workload

The data indicates that a dominant perception among teachers is that AI can meaningfully reduce their workload, particularly in tasks such as lesson planning and content delivery. This finding is encapsulated in quotes from Participants 2 and 3, who highlight AI's ability to be "time-saving" and provide "deep or in-depth" content. This perspective aligns with the "relative advantage" component of DOI theory [25]. Relative advantage refers to the degree to which an innovation is observed as being better than the idea it supersedes. Teachers' beliefs that AI can enhance teaching effectiveness and personalize learning (Participant 6) while making their work "easier" (Participant 7) suggest a strong perception of AI's relative advantage over traditional pedagogical methods. This is consistent with previous research that highlights the importance of perceived usefulness and ease of use in shaping teachers' willingness to adopt technology [18], [28].

B. Concerns about AI's Impact on Learning

Despite the positive views, a notable concern emerged regarding the potential for AI to foster "laziness" among learners (Participant 8). This sentiment reflects a critical, though less explored, aspect of the innovation adoption process: the perception of potential negative consequences or unintended outcomes. While most literature on AI in education focuses on its benefits, this finding points to the involvedness of teacher attitudes. The concern about students becoming overly reliant on technology, neglecting traditional skills like paperwork, highlights a tension between the perceived efficiency of AI and deeply held pedagogical beliefs about the value of manual effort and foundational learning skills. This cautious view is a crucial factor in the adoption process, as it can act as a psychological barrier, influencing the perceived complexity and compatibility of the innovation with a teacher's core values [25].

C. Willingness to Trust AI

The findings also reveal a high level of trust in AI among the teachers, with participants expressing trust levels of 90% and 95%. This willingness to trust stems from the belief that AI can perform tasks efficiently and is a necessary tool in a "busy world" (Participant

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3). This aligns with the DOI theory's concept of trialability and observability. Teachers' confidence in AI is likely rooted in their initial positive experiences or observations of its efficiency, even in a limited context. The high trust levels among the participants contrast with broader fears of AI-driven job displacement documented in some literature [17] and suggest a more pragmatic, problem-solving orientation among the teachers at Katoba Secondary School. Their readiness to "experiment with AI" (Participant 4) indicates a high degree of openness to innovation, a key characteristic of early adopters. This is actually a good sign and all what the teachers need is to be equipped with necessary skills in the use of AI.

Further are the results on the concerns about privacy and data security

Table: 2
Concerns about privacy and data security

Themes	*Supporting quotes*
Student Privacy & Data Security	*Participant 1: "the student privacy and data security will be compromised, as some people who are more knowledgeable, will see what one was searching."* *Participant 5: "Student data maybe prone to hackers, therefore, maybe, discrimination due to incomplete data."* *Participant 6: "The use of AI in teaching raises significant privacy concerns, including the risk of data breaches and exploitation."*
Socio-Cultural & Ethical Concerns	*Participant 3: "To ensure that learners are well informed on AI, there is need to help them and to ensure it is used wisely or for the intended educational purposes."* *Participant 7: "Student privacy and data security is very important as it forms part of the cultural norms for normal participation of an individual in certain program."*

Source: Research Data 2025

The results presented in Table 2, on "Concerns about privacy and data security," reveal that teachers at Katoba Secondary School hold significant reservations about AI integration, which extend beyond technical issues to encompass socio-cultural and ethical considerations. The two themes thus Student Privacy & Data Security, and Socio-Cultural & Ethical Concerns from table 2 are further discussed below;

D. Student Privacy and Data Security

Participants expressed direct concerns about the security of student data. For example, Participant 1's fear that "some people who are more knowledgeable will see what one was searching" suggests a lack of trust in the security infrastructure and a fear of unauthorized surveillance or data exposure. Participant 5's concern that student data may be "prone to hackers" and lead to "discrimination" highlights a worry about the tangible, negative consequences of data breaches. This aligns with broader global anxieties about data security in the digital age, as noted by researchers like Chanda [20]. These concerns are a direct challenge to the "observability" and "trialability" components of the Diffusion of Innovations (DOI) theory [25]. The perceived risks of data breaches may outweigh the perceived benefits of the technology, making teachers hesitant to experiment with AI tools.

E. Socio-Cultural and Ethical Concerns

The findings go a step further by linking data privacy to socio-cultural and ethical values. Participant 7's statement that "student privacy and data security is very important as it forms part of the cultural norms" is a crucial insight. It suggests that privacy is not just a technical or legal issue but a deeply rooted cultural value within the Zambian context. This finding supports the literature's assertion that AI implementation must consider local cultural practices [21]. The need to ensure AI is used "wisely or for the intended educational purposes" (Participant 3) reflects an ethical concern about misuse, which could erode trust in both technology and the educational institution. This finding underlines the importance of developing a culturally sensitive framework for AI deployment, as highlighted in [6], to align with local values and norms. Further are the results on the adoption and recommendations on the use of AI in schools

Table: 3
Readiness and recommendation for adoption

Themes	*Supporting quotes*
Need for Training & Professional Development	*Participant 1: "We need more training in AI as things change daily."* *Participant 2: "More teachers need ICT education and there is also a need for more CPD(s)."*

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	Participant 5: "More training on AI for all teachers." *Participant 7: "Conducting more CPD(s), and should be conducted by qualified presenters."*
Commendations for Infrastructure	*Participant 1: "The ministry of education should support schools by giving out internet facilities like routers and providing Wi-Fi in the schools."* *Participant 3: "Extend the provision of internet in the classes or expand the radius into classrooms."* *Participant 4: "The school should be connected to the electricity national grid or by solar."* *Participant 5: "Need for more Workshops tours to better AI infrastructures."*
Policy Changes for Smartphone Use	*Participant 7: "Allow learners to have smart phones in class."* *Participant 8: "I would suggest that at a certain percentage, learners should be allowed to use phones to enhance effective teaching."*

Source: Research Data 2025

The results in Table 3 reveal that teachers at Katoba Secondary School are interested in AI integration but pinpoint significant institutional and policy-level barriers that must be addressed for successful implementation. The data points to a clear need for targeted professional development, robust infrastructure, and flexible policy changes. From table 3 three themes emerged as discussed below.

F. Need for Training and Professional Development

The teachers' call for more training and Continuing Professional Development (CPDs) is a strong indicator of their readiness to adopt AI, provided they are equipped with the necessary skills. Quotes from Participants 1, 2, 5, and 7 all emphasize the need for ongoing education to keep up with the rapid changes in AI. This aligns with the Diffusion of Innovations (DOI) theory, where a key factor in successful adoption is the perceived "knowledge" of the innovation [25]. The teachers recognize that their current digital literacy is a barrier and are actively seeking to close this gap. Their request for training from "qualified presenters" also points to a desire for high-quality, effective instruction rather than generic sessions.

G. Commendations for Infrastructure

Participants' commendations for improving infrastructure, such as providing routers, Wi-Fi, and consistent electricity, are crucial for making AI a practical reality. The lack of reliable internet and power, as noted by Participants 1, 3, and 4, is a significant barrier to implementation. This directly relates to the "compatibility" and "trialability" components of DOI theory. Without the necessary infrastructure, AI tools are incompatible with the school environment and cannot be effectively tested or used in daily practice. These findings reinforce the literature that highlights inadequate ICT resources and inconsistent internet access as key obstacles to AI adoption in developing countries [16].

H. Policy Changes for Smartphone Use

The recommendation to allow learners to use smartphones in class represents a pivotal policy shift. This suggestion, from Participants 7 and 8, indicates that teachers are beginning to view smartphones not as a distraction but as a potential pedagogical tool for "effective teaching." This finding suggests a significant change in "school-level cultural practices." Allowing learners to use their personal devices could bypass some of the infrastructural challenges by leveraging existing technology. This would also align with broader trends in education technology and is a pragmatic, cost-effective approach to piloting AI integration [16]. However, such a change would require a clear school-wide policy to manage and guide this new practice.

SUMMARY OF THE STUDY

This qualitative case study, grounded in the Diffusion of Innovations (DOI) Theory, explored the cultural influences on teachers' attitudes toward AI integration at Katoba Secondary School in Chongwe District, Zambia. The research aimed to understand how teachers' beliefs, privacy values, and the school's cultural practices affect AI adoption. The results disclose a complex and nuanced picture of readiness and resistance.

Below are the recommendations for addressing the results

- RECOMMENDATIONS

Based on the results, the following are the proposed recommendations:

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1. For the Ministry of Education:

1. The Ministry should include a dedicated budget for providing reliable, high-speed internet connectivity and modern computer laboratory facilities to all schools.
2. The Ministry should also mandate the inclusion of AI literacy as a compulsory component of all teacher training programs at colleges and universities.
3. Furthermore, the ministry should fund CPD programs specifically focused on AI pedagogy for in-service teachers.
4. A national framework for student data privacy and ethical AI use in schools should be developed.
5. The Ministry should also clarify policies regarding the use of personal devices by learners to support AI-driven instruction.

2. For School Administrators:

School administrators should prioritize the allocation of resources towards upgrading school infrastructure, including securing reliable power sources and enhancing internet capabilities.

Administrators should foster a culture of peer support by identifying and empowering digitally proficient teachers to serve as mentors.

3. For Teachers:

Teachers should engage in continuous learning on issues related to AI and ICT.

Teachers should be empowered to experiment with AI tools in their classrooms.

4. AREAS FOR FUTURE RESEARCH

We recommend for further investigation to develop a detailed, practical, and culturally-responsive ethical framework for the use of AI in classrooms. This could explore the specific challenges related to data bias, algorithmic transparency, and the potential for AI to reinforce or challenge existing social norms.

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