Role of AI in climate change communication: Implications on understanding and trust in climate science

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Abstract

Climate change has emerged as a major contemporary global concern, especially as the scientific consensus on anthropogenic causes grows. Extreme climate events continue worsening as global temperatures increase, leading to loss of human lives and slow economic progression at the global level, with the Global South being the most affected. However, despite the notable challenges caused by climate change, concern from the public and policymakers often does not match the magnitude of the impact of climate change. Amidst such concerns, artificial intelligence emerges as a powerful tool for climate change communication, with its integration fostering understanding, concern, and trust in climate science. The emergence of generative artificial intelligence, catalysed by OpenAI's introduction of ChatGPT, revolutionised the way climate science is communicated to the public, although it came with challenges for communicators. This study, therefore, sought to explore Zimbabwean legislators' perception of the role of AI in climate change communication and its implications on trust in climate science. The study also intended to determine policymakers' perceptions of the challenges associated with the integration of AI in climate change communication in Zimbabwe. This qualitative study used in-depth interviews targeting Zimbabwean parliamentarians. The impetus of this study arose from a dearth of literature on the application of AI in strategic climate change communication and its implications for audience understanding and trust in climate science. The qualitative thematic analysis revealed three key perspectives: AI as an effective tool for enhancing public climate change communication and fostering trust through its fact-checking capabilities; skepticism towards AI due to perceived complexity and concerns over Western epistemic dominance; and AI as a potential conduit for climate misinformation in the hands of contrarians, thereby undermining public trust in climate science. These perspectives have an impact on parliamentarians' behavioural intention to support AI policies.

Keywords

Climate change communication; Artificial intelligence; Climate change; Science communication; Parliamentarians

Introduction

Climate change poses a profound threat to the planet's ecological balance, human societies, and economic systems (Rane et al., 2024). The complexity and scale of this global challenge necessitate the use of sophisticated tools and techniques to understand, model, and project future climate conditions (Biswas, 2023). There is also a need for effective, complementary communication to address the anthropogenic causes of climate change and its associated effects (Chadwick, 2016; Campbell et al., 2023; Lee et al., 2024). However, studies have shown that communicating about climate change to the public is indeed a challenge (Penz, 2022), and this requires leveraging innovative approaches for effective climate science communication, fostering understanding and climate science literacy. Climate science communication in this case is conceptualised as a specialised practice that involves translating complex scientific concepts on climate change into simplified information for a diverse audience, to foster informed decision-making, behavioral change, and societal resilience. For many audiences, climate change is still considered an ambiguous, abstract, complex, and invisible issue (Calzadilla, 2019), which is difficult to understand. It is also evident that there is a pervasive lack of understanding and trust in climate science among various audiences, posing a significant barrier to effective policy-making and meaningful action (Sanders & Hendricks, 2023). As such, emerging technologies, such as artificial intelligence (AI), offer promising solutions to address this critical issue.

Natural language processing tools can help policymakers and activists stay ahead of the changing public conversations on climate change, as they can quickly identify shifts in public opinion, allowing for more targeted responses to evolving public discourse (Stede and Patz, 2021). ChatGPT, a cutting-edge language model developed by OpenAI, presents a unique opportunity to revolutionise climate change communication and enhance the implementation of mitigation and adaptation strategies (Rane et al., 2024). In the context of AI and climate change communication, studies have focused on the application of AI data visualisation (Luccioni et al. (2021, Huang et al., 2019; Angelis, 2023; Rolnick et al, 2022), and in content generation and writing articles (Huang and Tan, 2023). There is, however, a paucity of literature on the application of AI in climate change communication and its implications on trust in science in the Zimbabwean context. Against this backdrop, this study seeks to fill this gap by exploring Zimbabwean parliamentarians' perceptions of the role of AI in climate change communication and its implications on trust in climate science. The study, therefore, answers the following questions:

- What do Zimbabwean legislators perceive as the potential role of AI in climate change communication?
- What do legislators perceive as the possible influence of AI on public trust in climate science?
- What specific concerns do Zimbabwean legislators have regarding the potential for AI-driven climate change communication?

This study is important given that it contributes to the scientific discourse on the integration of AI in climate change communication and its implications on trust in science, from the perspectives of policymakers.

AI and climate change communication

While seemingly a recent phenomenon, artificial intelligence has roots dating back over 70 years (Hopgood, 2024; Russel and Norvig, 2010). Alan Turing, considered the father of theoretical computer science, envisioned machines capable of surpassing their initial programming (Turing, 1950). He developed the "Turing test," a benchmark for assessing machine intelligence by its ability to mimic human conversation. The Dartmouth Summer Research Project on Artificial Intelligence in 1956 is widely recognized as the birth of the field (McCarthy et al., 1955). The workshop, convened by John McCarthy, aimed to explore the possibility of "thinking machines," laying the groundwork for the pursuit of AI. Despite its rudimentary nature, Eliza's ability to engage in conversation fooled many users into believing they were interacting with a human therapist. The development of Shakey the Robot in the 1960s by the Stanford Research Institute marked another milestone. Shakey, equipped with sensors and a TV camera, was designed to navigate environments independently, advancing concepts in visual analysis, route finding, and object manipulation (SRI, 1972).

OpenAI unveiled ChatGPT, a conversational AI chatbot built upon its foundational large language models (LLMs) like GPT-4 and its predecessors (Marr, 2023). This groundbreaking technology quickly captured global attention, sparking a surge of interest in AI-powered chatbots. The release of ChatGPT also fueled the development of similar technologies, including Google's Bard, Microsoft's UnlimBot Chat, and Amazon's Q, further solidifying the emergence of chatbots as a significant force in the technological landscape. OpenAI claims it has the fastest tech user base of all time, as the public has demonstrated its eagerness to use its capabilities (Sanders & Endricks, 2023). To understand the impact of these tools, it is essential to contextualise their origins and the evolving perceptions surrounding them. While these early

iterations were limited in their capabilities, they laid the foundation for the sophisticated generative AI systems we see today. This trajectory can be traced back to the early chatbots of the 1960s, demonstrating the continued evolution of AI. At present, AI has ushered in an era where human-machine and AI-mediated communication have become sophisticated.

The reality of AI-mediated communication has infiltrated the climate change communication landscape, as the technology has been adopted to streamline various communication functions (Hohenstein & Jung, 2020). AI has been adopted for climate communication, among other reasons, for its ability to scale up and down, the linguistic complexity of climate science, in relation to the needs of the user (Angelis et al., 2023). Nisbett & Spaiser (2023) explored GPT-3's ability to generate convincing moral arguments for climate action and found that AI-generated statements are more convincing than human-generated statements. In a related study, Ni, Wu & Huang (2023) examined the persuasive impact of AI voice in promoting pro-environmental behaviours. The study found that AI was as effective as the human voice in eliciting risk perception and motivating pro-environmental behavioural intentions. Atkins (2024), however argues that AI enhances climate literacy, but must be scrutinised for potential biases and inaccuracies. Rolnick et al (2022), assert that it is possible to develop educational resources, such as generating visual representations of the potential consequences of severe weather events through AI and machine learning. In addition, AI continues to transform how scientists and a variety of publics interact and communicate (Kupper et al., 2021). Social bots in particular contribute to the climate change conversation, both through frames that support and oppose climate action (Daume, Galaz & Bjerser, 2023), and influence public discourse on social media. Machine learning tools can also be used to evaluate the effectiveness of communication interventions in climate change communication (Harinen, Filipowiez, Hakimi Ilieve and Klenk, 2022). ChatGPT in particular has permeated the practice of science communication, offering opportunities for streamlining communication tasks such as writing news articles, social media posts, or media releases and generating slogans and headlines for communication campaigns (Schäfer, 2022). In the context of climate change, Sanders and Hendricks (2023) suggest that AI can play a crucial role in communicating complex scientific information to policymakers and the public in a more accessible and engaging manner. Artificial intelligence, thus, is set to transform climate change communication practice.

AI and public trust in science

The use of AI in various fields, such as climate science communication should not be over-celebrated. Concerns have emerged regarding the potential for an "AI-driven infodemic" fueled by the capacity of large language models to generate vast amounts of text at an unprecedented rate (Angelis et al., 2023). The reasoning here is that too much information may be damaging for audiences to decipher the message. This raises anxieties about a potential "pollution of our knowledge pool" (Nerlich, 2023), where users, and even the AI tools they may rely on for information in the future, could face challenges in discerning reliable scientific information amid an overwhelming deluge of content. Additionally, large language models like ChatGPT suffer from two major issues: hallucination and outdated information after training has concluded (Vaghefi et al., 2023). These issues are particularly problematic in domains such as climate change, where it is critical to have accurate, reliable, and timely information on changes in climate systems, current impacts, and projected risks of climate change and solution space. Nerlich (2023) cautions that AI can also erode trust if it is not transparent, accountable, and used ethically. There are concerns that AI's lack of references to back up its claims fuels distrust in the reliability and transparency of AI-generated content (Vasiljev, 2024). The scholar concluded that AI was discussed by contrarians in a manner that deepens distrust towards mainstream scientific narratives. The challenge of trust is also evident at the source level, as AI research has shown that there are longstanding and wide-ranging debates on trust and trustworthiness in technology, especially AI (2024), and organisations have recognised the need for ensuring AI trustworthiness through their pledges on the ethical use of the technology.

Despite these challenges, AI presents a unique opportunity to enhance public trust in climate science. By engaging a largely disengaged public, AI could significantly contribute to global health and well-being (Sanders and Hendricks, 2024). For instance, in countries like the US, polls revealed that Americans are skeptical towards using AI chatbots in sensitive areas like medical decision-making (Sanders and Hendricks, 2024). It is important to note that similar skepticism exists towards human scientists and climate communicators. If developed with transparency and trustworthiness, AI chatbots could empower users to independently scrutinize evidence related to climate change, potentially offering a more objective perspective than interacting with perceived biased human experts. Artificial intelligence can be used to fight misinformation and disinformation, enhancing trust in science (Schäfer, 2023). This is consistent with findings from a study by Fatima and Santos (2023), which revealed that AI, natural language processing, and machine learning technologies have proved to be useful in

automating the process of fact-checking, incorporating both language and sentiment analysis in the fight against disinformation. In addition, Unver (2023) discovered that AI, block chain and machine learning are used to identify patterns of misinformation, detect misleading information, timestamping and securing verified information (Unver, 2023). Thus, AI has the potential to improve trust in science by ensuring that the information disseminated to the public is accurate and truthful.

Role of parliamentarians in the adoption of AI

Parliamentarians, as policymakers, play a significant role in the regulation and subsequent adoption of artificial intelligence. They are responsible for developing policies that guide the ethical and appropriate use of AI. As AI becomes instrumental in analysing and disseminating climate data, policymakers must develop policies and regulations that prioritise transparency, cultural inclusivity, and gender equity in communication outputs (Gwagwa et al., 2020). This has similarly been emphasised by Ghosh et al. (2025), who argue that policymakers should formulate governance frameworks that effectively address the emerging challenges posed by increasingly complex and autonomous AI systems. AI's transformative potential across sectors highlights the need for structured governance to mitigate risks such as bias and privacy violations. While the role of policymakers in the development of AI governance frameworks is widely acknowledged, critics argue that current policy approaches, particularly in Africa, often prioritise technological advancement over equitable outcomes (Njoroge, 2024). This challenge is more acute in climate science communication, where AI systems used for data analysis and public messaging have the potential to perpetuate existing power asymmetries. Gruetzemacher & Whittlestone (2022) emphasise that AI's transformative potential in climate science demands governance that balances innovation with safeguards against misinformation, a task that requires parliamentarians to collaborate with scientists. Parliamentary perceptions and role in this transformative potential are, however, under-researched, and this study therefore seeks to fill this gap.

Ethical considerations are critical, particularly in ensuring accountability for AI systems that synthesise climate projections, where errors could disproportionately impact human rights in climate-vulnerable regions (Radanliev, 2025). To prevent exploitative gaps, Gaffley et al. (2022) advocate for policies that actively include marginalised groups in AI development cycles, mandate participatory design of climate communication tools, and enforce sector-specific regulations to curb algorithmic bias. The use of AI for climate science communication,

therefore, requires a supportive policy environment that protects the public while leveraging its maximum potential. To ensure that the use of AI does not widen existing exploitative gaps in AI deployment, Gaffley et al. (2022) recommend that policymakers, and other relevant stakeholders should engage in deliberate initiatives to: incorporate women and historically marginalised groups by prioritising information consumer protection, foster multi-agency collaboration, formulate sector-specific data and AI regulations and policies. Emphasising the strategic role of policy makers in the ethical deployment of AI tools for climate science communication, Stahl et al. (2023) argue that ethical issues should be addressed clearly in policy at the earliest feasible level to guarantee that ethical norms are developed internally in accordance with social and cultural values, as opposed to being implemented de facto by actors from the outside. While extant literature has provided significant insights on the application and utility of AI tools, as well as the role of policymakers in the adoption and deployment of AI tools for climate science communication, there is a dearth of literature on the how policy maker's perceptions can influence AI adoption in climate science communication.

Theoretical framework

This paper draws upon the Technology Acceptance Model (TAM) to understand Zimbabwean parliamentarians' perceptions of the use of AI in climate change communication and its implications on trust in science. The Technology Acceptance Model, as proposed by Davis (1989, 1993), explains the acceptance of technology by individuals based on their perceived usefulness and ease of use. The model proposes that perceived ease of use and perceived usefulness predict the acceptance of a technology (Ma & Liu, 2005). Perceived ease of use and technology usefulness are cognitive appraisals that influence users' attitudes towards the technology, which is an affective response (Marikyan & Papagiannidis, 2023). This attitude, in turn, shapes the user's attitude towards the user's intention to use the technology, resulting in the actual use behaviour. Individuals are more likely to adopt and use a technology if they perceive it as beneficial in performing their tasks and if they find it easy to learn and use, according to the TAM.

This paper concedes that the TAM helps in explaining how Zimbabwean MPs perceive the usefulness of AI in informing their understanding of climate change and how easy they find it to interact with and understand AI-based tools and information. Their understanding of the usefulness of AI in climate change has the potential to drive their policy influence towards the adoption and use of AI in climate change modelling and public communication of climate

science. TAM centres on individual perceptions of technology, which is crucial for understanding how parliamentarians, as key stakeholders in the climate science landscape, perceive the potential of AI, and their acceptance of the technology, which can result in their support for the adoption of the innovation. Understanding the factors influencing parliamentarians' acceptance of AI is crucial for promoting informed decision-making on climate change policies and strategies. TAM provides the angle from which parliamentarians' perceptions of the value of AI for communicating climate information effectively can be analysed. Moreover, the model provides the basis for exploring perspectives on the integration of AI for climate change communication and the potential challenges that affect their level of acceptance of the technology in relation to trust in climate science. The model helps in analyising the complementary environmental factors that influence technology adoption and use (Na et al., 2022), and its implications on the development and adoption of policies that promote this use of AI in Zimbabwe.
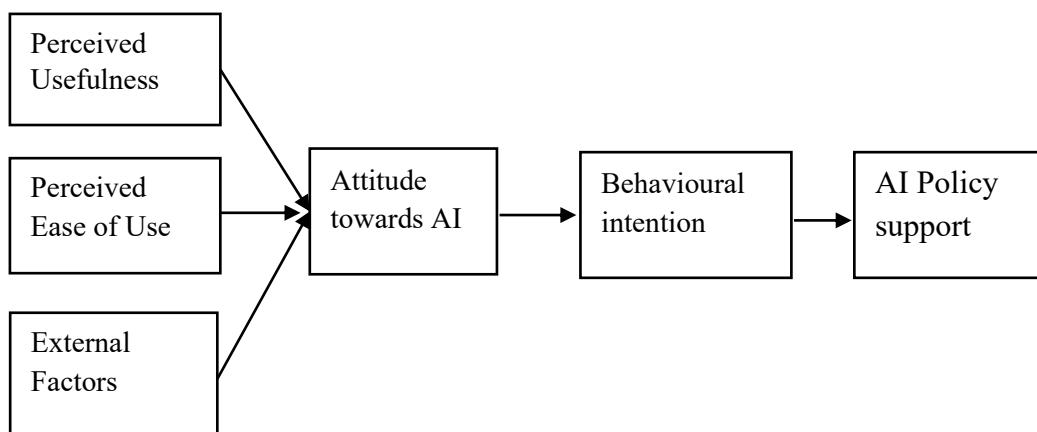

Figure 1: Adapted TAM for AI Adoption in Climate Communication

Methodology

This study is ingrained within the interpretivist paradigm, and a qualitative research approach was adopted to explore Zimbabwean parliamentarians' perspectives on the adoption and use of artificial intelligence in climate change communication and its implications on trust in science. This approach, characterised by its unstructured, flexible, and open-ended nature (Kumar, 2011), allows for in-depth exploration of the complex interactions between AI, climate change discourse, and trust in science. The qualitative approach also helps in exploring how parliamentarians perceive AI's usefulness in shaping climate narratives and public trust. Data

were collected using in-depth interviews, which offered a distinct advantage, as they allow for a comprehensive exploration of individuals' perspectives and experiences, providing more detailed information than other data collection methods alone (Boyce and Neale, 2006). The interviews were tape recorded with the consent of the participants and transcribed verbatim. The population comprised 13 purposively selected parliamentarians, with at least one year of active engagement in climate-related legislative discussions, and who are directly involved in climate change thematic debates. In qualitative research, a sample size of at least 12 participants is required to reach thematic saturation (Vasileiou, Barnett, Thorpe and Young, 2018). This validates the sample size used in this study. The researchers ensured privacy and confidentiality, as well as informed consent.

Findings

This study set out to explore Zimbabwean parliamentarians' perceptions of the role of artificial intelligence in climate change communication and its implications for trust in climate science. Empirical evidence in this study indicates that Zimbabwean parliamentarians see AI as instrumental in improving public access to climate information. Through a thematic analysis of the interviews, responses revealed four key themes, which are summarised in the table below: Perceptions of AI Technology, AI's Role in Climate Communication, Trust and Reliability in AI-Mediated Climate Science, and Barriers to AI Adoption (See Table 1.).

Table 1. Codes, themes, subthemes and example statements

Main Theme	Sub-Theme	Codes	Example Statements
Perceptions of AI Technology	Awareness and Understanding of AI	Basic familiarity with AI tools	"A system whereby machines now have the same intelligence as human beings..." (Participant 7)
		Lack of dedicated AI tools in Zimbabwe	"I'm very familiar with AI... but I have no idea of any AI tool that is being used in climate change communication in Zimbabwe." (Participant 4)

AI's Role in Climate Communication	Enhancing Accessibility and Understanding	Simplifying complex information	"You can start learning about climate change and get to understand the subject even better..." (Participant 3)
	Skepticism & Concerns	AI complexity and distrust	"The use of AI can further make the climate change discourse even more difficult..." (Participant 10)
Trust and Reliability in AI-Mediated Climate Science	Strengthening Trust in Climate Science	AI for fact-checking & transparency	"If it is managed well... AI can enhance public trust in climate science." (Participant 13)
		Reliability & accuracy	"What makes something trusted is reliability and accuracy... AI has passed these two tests." (Participant 9)
	Erosion of Trust	AI inaccuracies & misinformation risks	"AI is not 100 percent accurate... that says a lot about whether it must be believed or not." (Participant 3)
Barriers to AI Adoption	Infrastructure & Accessibility	Internet limitations in rural areas	"We do not have enough internet coverage in rural areas... data is also expensive." (Participant 1)
	Technical & Literacy Challenges	Low AI & computer literacy	"AI can only be utilised by people who have a technological knowhow... Not every MP has the capacity..." (Participant 11)

Understanding and awareness of AI

Participants demonstrated a basic understanding of the concept of artificial intelligence, its characteristics, as well as AI tools that can be used for climate change communication. All participants were conversant with conversational chatbots and large language model-based tools that are applicable in the public communication of climate change. Participant 7 understood the concept of AI as:

> *A system whereby machines now have the same intelligence as human beings, making them do the same work and think as natural beings.*

Consistent among the majority of the participants is the description of AI as a super technology that can perform tasks at great speeds, and beyond human capacity. However, participants were not aware of any AI tool designed specifically for the public communication of climate change in Zimbabwe, although they are conversant with AI and its potential. Participant 4 said:

> *I'm very familiar with AI and its capabilities in generating text and other content, but I have no idea of any AI tool that is being used in climate change communication in Zimbabwe.*

AI tools that were identified by participants as useful for climate change communication include virtual assistants and chatbots such as ChatGPT and Meta AI. All participants were conversant with ChatGPT, a large language model-based chatbot. Despite the lack of awareness of dedicated AI tools for climate change communication, participants expressed their willingness to learn and understand how these technologies have been integrated into climate change communication.

Potential of AI in climate change communication

Empirical findings from the interviews indicate that Zimbabwean members of parliament regard artificial intelligence as a crucial tool in climate change communication. They identified AI's potential to improve public access to climate information. The MPs expressed optimism about AI's ability to make climate change more understandable. They emphasised its capacity to simplify complex information into smaller, more accessible segments and to use visuals that capture attention and encourage engagement. Highlighting the potential value of AI, with specific reference to ChatGPT in climate change communication, Participant 3 stated:

You can start learning about climate change and get to understand the subject even better than you could when listening to someone explaining it.

In addition, Participant 1 identified the potential of AI in ChatGPT, indicating that OpenAI's large language model-based tool is very popular, owing to its ability to generate content that cannot be easily separated from human-generated. The participant made the following remarks:

ChatGPT is one of the best platforms that both lawmakers and the public can take advantage of to access climate change information timely. The platform answers within seconds if you ask anything about climate change. It creates an engagement that makes you feel like you are talking to another human being.

However, other participants demonstrated skepticism concerning the potential of AI for climate change communication, considering it a complex tool that can worsen the existing complexities associated with climate change. There were generally mixed perspectives about the potential and value of AI for climate change communication. Participant 10 argued:

The use of AI can further make the climate change discourse even more difficult. I say so because AI itself is a complex thing. Despite having been there for years, the majority of us, MPs, do not know how it works and where to use it.

This highlights the need for greater understanding and education around AI to ensure it can be harnessed effectively rather than becoming another barrier in the already complicated dialogue on climate change.

AI and its implications on trust in science

The incorporation of artificial intelligence into climate change communication constitutes a complex terrain, possessing the capacity to both strengthen and diminish the trust of the public and policymakers in climate science. While a considerable number of participants in this study regard AI as a potent instrument for fostering trust, others express apprehensions regarding its limitations and the risk of eroding confidence in climate science. Participant 13 was positive about AI's role in strengthening trust in the science behind climate change:

If it is managed well and if it is also controlled, it can enhance public trust in climate science. I know there are some fears which may cause distrust because it can be misused, but so far, the advancements we are seeing are also based on science. And

generally, if it is communicated well and if it is managed well, AI can enhance public trust in science.

It also emerged from the findings that AI's ability to promote transparency and its fact-checking capabilities help to fight misinformation and improve public trust in the science of climate change. In addition, reliability and accuracy parameters have been identified as mediators for public trust in science, and since dedicated AI tools are generally accurate, they can be trusted tools for climate change communication. In that context, participant 9 said:

AI can increase the public's trust in science insofar as climate change is concerned. What makes something trusted is reliability and accuracy. So far, AI has passed these two tests therefore, it can be trusted in relaying scientific information on climate change.

However, a counter-argument emerged from the data gathered as other participants highlighted the potential pitfalls of AI's application in climate change communication. There are concerns of misinformation and disinformation, which can erode trust, as well as the use of AI by deniers to spread disinformation on climate change. Other participants pointed out AI inaccuracies as having an impact on public trust in science, as the tool is doubted as a mediator for accurate climate science communication. In that context, participant 3 said:

There are certain issues that AI developers ought to improve before it can be trusted to communicate important subjects like climate change. AI is not 100 percent accurate, and that on its own says a lot about whether it must be believed or not.

Participant 13 added that AI itself cannot be trusted, therefore, the information that it conveys should be handled with caution. The participant said:

It is naive to believe this kind of technology in communicating crucial subjects like climate change. Questions have to be raised about using this technology and for me I cannot really trust its information on science when it comes to climate change.

These insights point to the importance of critically evaluating AI's role in climate change communication to ensure that its use is transparent and accompanied by safeguards to prevent misinformation and maintain public trust.

Barriers to AI adoption

Despite the prevailing optimism regarding the use of artificial intelligence, participants raised concerns about its effectiveness for climate change communication in Zimbabwe. They pointed to accessibility issues stemming from infrastructural challenges, particularly in rural areas that are disproportionately affected by the impacts of climate change. The cost of internet bandwidth was also identified as a significant barrier to the deployment of AI in this context. Reflecting on these challenges, Participant 1 made the following remarks:

> *If it attracts huge followers like WhatsApp, Twitter and Facebook, it is definitely a tool that can be used to communicate climate change information. The only challenge is that we do not have enough internet coverage in the rural areas of Zimbabwe and data is also expensive.*

Participants also highlighted that the AI tools require basic technical understanding to be used effectively, especially for effective prompt strategies when using conversational chatbots, which can be a challenge where there are low levels of computer literacy. Participant 11 said:

> *Remember AI can only be utilised by people who have technological know-how. Not every MP has the capacity to effectively operate a smartphone or a computer. The gadgets themselves that are used to access AI are not very simple and straightforward.*

In light of these observations, it is evident that while AI holds promise for enhancing climate change communication in Zimbabwe, significant infrastructural and educational barriers must be addressed to realise its full potential. The digital divide, particularly between urban and rural areas, coupled with the high cost of internet access and limited technological literacy, poses substantial challenges to equitable and effective deployment. Consequently, any strategy aiming to leverage AI for climate communication must prioritise improving digital infrastructure and capacity-building initiatives to ensure inclusive access and meaningful engagement across all segments of the population.

Discussion

While participants demonstrated a basic understanding of artificial intelligence (AI) and its applications, such as ChatGPT and Meta AI, they lacked awareness of how these specific AI tools could be utilised for climate change communication in Zimbabwe. However, they

indicated interest in exploring how these technologies could be integrated into climate change communication efforts. There was enthusiasm among participants to learn more about leveraging AI to improve climate change communication, especially the science element side of it. Rodgers (2003) highlights this point by accentuating that the general understanding of what AI entails is important, as awareness of the technology is the first step towards technology acceptance. The ability to identify AI tools is important for legislators to drive the adoption of the technologies with which they are familiar. As AI was never alien to parliamentarians, according to the data gathered, chances are that, in addition to usefulness and ease of use as driving factors, they are likely to influence the adoption and use of the technology in climate change communication in Zimbabwe. These findings support earlier studies that identified a correlation between awareness and intention to use a particular technology (Flavian et al., 2022; Delcker et al., 2024).

Empirical findings indicate that MPs hold varied perspectives regarding the utility of AI in climate change communication, though many perceive it as instrumental. While a significant number expressed optimism about AI's capacity to enhance public access to climate information by simplifying complex concepts, utilising engaging visuals, and providing timely, human-like responses, thereby fostering greater understanding and engagement, other participants articulated notable reservations. This divergence aligns with the principle that perceived usefulness is a pivotal cognitive appraisal influencing attitudes towards technology (Marikyan & Papagiannidis, 2023). The positive appraisal by some policymakers thus suggests a conducive environment for accelerated AI adoption in this field, a finding consistent with existing research on AI's efficacy in clarifying scientific information (Angelis et al., 2023; Schäfer, 2022; Hendricks, 2023). Conversely, a segment of MPs exhibited scepticism, contending that AI, being inherently complex, could exacerbate the challenges associated with the climate change discourse, potentially precipitating AI disinvestment, particularly given their confessed limited understanding of its operation. Moreover, a more critical viewpoint emerged, positing AI as a tool employed by Western nations to disorient and mislead developing countries on climate change, allegedly to obstruct industrialisation through fossil fuels; this perspective resonates with studies positioning AI within the colonial matrix of power (Muldoon & Wu, 2023). Collectively, these findings show the complex and occasionally conflicting nature of Zimbabwean MPs' perceptions concerning AI's role and value in climate change communication. Such diverging perspectives reflect a potential lack of support for AI policies that favour its integration in climate science communication.

The integration of AI into climate change communication presents a complex challenge, with the capacity to both bolster and erode public and policymaker trust in scientific knowledge. While a notable proportion of participants in this study perceive AI as a powerful instrument for cultivating trust, citing its potential for managed communication, enhanced transparency, and robust fact-checking capabilities that combat misinformation and improve data accuracy, others articulate significant apprehensions. Concerns primarily revolve around the risk of AI-generated disinformation and the potential for its deliberate misuse by climate change deniers to disseminate falsehoods. These findings are consistent with extant literature where skepticism around climate change was found to be influenced more by the clarity, consistency, and transparency of information sources. The trust deficit also grows when science is communicated through opaque channels (Drons and Rivera-Mariani, 2025). Furthermore, the inherent inaccuracies of AI systems are highlighted as a crucial impediment to their credibility, leading to doubts about their reliability as a mediator for precise climate change communication. Consequently, the findings reveal a dichotomous perspective regarding AI's overall impact on trust in scientific information within this critical field.

It is evident that despite the acknowledged potential of AI in enhancing public trust in science, the technology still faces denial and skepticism, the same way as the science it intends to mediate. The acknowledgement of the potential of AI to enhance trust in climate science is consistent with findings from previous studies, which identified AI as an effective tool for detecting deepfakes and for fact-checking (Fatima and Santos, 2023). Perceived usefulness of AI in challenging climate change misinformation and disinformation is a precursor to the development of positive attitudes towards the technology, and overall adoption. Zimbabwe's National Climate Change Response Strategy highlights the need for public awareness-raising and effective communication, including the integration of digital technologies in addressing the climate crisis. As such, parliamentarians' positive perception of AI for climate change communication can foster accelerated efforts for the adoption of AI for public communication through AI policy support, in line with the country's response strategy. On the flipside, concerns regarding the potential of AI to worsen climate change misinformation and erode trust support findings from earlier studies (Vaghefi et al., 2023). This, however, highlights the need for the development of transparently tested, dedicated, and supervised AI tools that promote information accuracy, to enhance trust in climate science.

Despite the optimism surrounding AI, its efficacy for climate change communication in Zimbabwe faces significant challenges, particularly regarding accessibility and digital literacy.

Such barriers can result in negative perceptions and a lack of support for AI policies by parliamentarians. Participants highlighted substantial infrastructural limitations, specifically the inadequate internet coverage in rural areas, which are disproportionately impacted by climate change, alongside the prohibitive cost of bandwidth. Furthermore, the effective utilisation of AI tools, particularly conversational chatbots, necessitates a foundational technical understanding, including proficiency in prompt strategies. This presents a considerable obstacle in contexts characterised by low levels of computer literacy, even amongst policy makers, who may struggle with the inherent complexity of accessing and operating the necessary digital devices. These factors collectively impede the widespread and equitable deployment of AI for climate change communication within the country. In addition, the adoption of AI can be hindered by the ethical challenges associated with the technology. As findings indicated that AI can be used unethically by Western powers, as a surveillance tool, policymakers' behavioural intention to support AI policies can be negatively impacted. This is consistent with findings in earlier studies, which highlighted the need for effective policies that address the ethical dilemmas associated with exploitative AI use before its widespread adoption (Stahl et al., 2023).

It is apparent from the findings that computer and AI literacy are not challenges only for the public, but for the policymakers as well. The Technology Acceptance Model identifies perceived ease of use as a predictor for technology adoption and use, therefore, parliamentarians' view of AI as a complex tool may potentially hinder its adoption, as they may not support policies that facilitate AI adoption for climate science communication. This entails the need for capacity building to foster the adoption and use of AI and legislators' resolve to drive the adoption of the technology for the public communication of climate change. Trust, perceived ease of use, and perceived usefulness are critical factors that can influence parliamentarians' intention to support the adoption of artificial intelligence tools (Cheng et al., 2023). The lack of appropriate infrastructure and network challenges are among the major challenges affecting AI adoption in Africa (Ade-Ibijola & Okonkwo, 2023). This entails a need for investment in appropriate infrastructure, improved access to the network, and availability of affordable internet for the effective deployment of AI for climate change communication. All in all, the adoption of AI for climate change communication still faces challenges, but its integration in climate change communication is a reality, as its usefulness is perceived positively.

Conclusion

AI has the potential to transform the climate science communication landscape, fostering public understanding and trust in science. These perceived benefits can create a supportive policy environment for AI adoption, as the behavioral intention among policymakers positively correlates with ease of use. The study also concludes that there is a general understanding and awareness of AI and its potential role in the public communication of climate change among policymakers, and conversational chatbots such as ChatGPT and Meta AI are popular tools suited for climate change communication. These chatbots can disseminate climate information and enhance public awareness of climate change. Legislators also view AI tools as useful and relatively accessible, which favours their adoption and use for climate change communication. However, despite the recognised potential, there are concerns that the technology may also propagate misinformation and disinformation in the hands of contrarians. This negatively impacts public trust in climate science. The skepticism regarding AI integration also reflects broader anxieties about technological sovereignty in an uneven digital landscape where the privileged West holds dominance.

The study primarily focused on parliamentarians' perspectives and does not include public perceptions on AI-mediated climate science. The inclusion of diverse stakeholders could also have provided a more comprehensive understanding of AI's role in climate science communication. The study's reliance on qualitative findings and a relatively smaller sample affects the generalisability of the findings.

Based on the findings, this paper makes the following recommendations:

- Capacity building on basic AI use should be provided to improve acceptance and use of the technology for climate change communication, among both parliamentarians and the public.
- Infrastructural challenges should be addressed to ensure equitable access to AI tools that can be used by the public as sources of climate information.
- Dedicated AI platforms should be developed, with relevant, up-to-date training data to improve the accuracy of the information disseminated.

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