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**Original Research Article**

# Investigation of the Strategies to Regulate the Usage of AI Chatbots in Higher Education: Harmonizing Pedagogical Innovation and Cognitive Skill Development

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**Abstract:** This study investigates the strategies for regulating the usage of AI chatbots in higher education to harmonize pedagogical innovation and cognitive skill development among graduate students. The study adopts a qualitative methodology that involves semi-structured interviews with 12 lecturers from 11 Zimbabwean universities. The findings reveal that although AI chatbots present opportunities to enhance learning experiences and cognitive skill development, their usage by graduate students presents challenges that require regulation. Negative perceptions of using AI chatbots by graduate students included cheating, plagiarism, and reduced interaction. Positive perceptions had research flexibility and cheapness. To regulate AI chatbot usage in higher education, lecturers employed active learning strategies and tailor-made coursework. At the same time, universities implemented Viva Voce and AI software detectors to discourage cheating and plagiarism. The study contributes to the literature on AI chatbots in education by highlighting the importance of cultural and social factors in their integration. The findings provide practical implications for educators and institutions in regulating the usage of AI chatbots in higher education, thus promoting cognitive skill development while avoiding their negative impact.

**Keywords:** AI chatbot, Cognitive skill development, Graduate Students, Higher education, Pedagogical innovation.



## 1.0 INTRODUCTION

The integration of artificial intelligence (AI) chatbots in higher education has emerged as a pedagogical innovation with the potential to transform the learning experience for graduate students. As Lo and Hew (2023) suggest, AI-based chatbot-supported flipped learning can enhance students' learning experience. AI chatbot technology for interactive ICT-based learning is suitable for simultaneously learning foreign languages and cultural content (Mageira *et al.*, 2022). Previous research has demonstrated that integrating AI chatbots in educational environments has resulted in favorable outcomes for students in various areas, such as active and constructive learning and creative and social learning (Bii, 2013). According to Chassignol *et al.*, (2018), artificial intelligence (AI) is posited to have a transformative influence on education. Using artificial intelligence (AI) systems and chatbots in education is a promising avenue for progress (Kooli, 2023). AI chatbots have been specifically developed to offer customized and interactive support throughout multiple domains of academic existence, encompassing the provision of responses to inquiries, the delivery of constructive criticism, and the presentation of recommendations for enhancement. Chan and Tsi (2023) assert that using artificial intelligence (AI) in educational environments significantly improves both the instructional and learning procedures while avoiding any perception of replacing conventional approaches. Chatbots are becoming recognized as a new type of automation, progressively gaining acknowledgment inside organizations in Zimbabwe. Graduate programs hold significant importance within the educational structure of Zimbabwe, and the integration of chatbots to enhance the learning process is a crucial development. The study by Chang *et al.*, (2023) demonstrates that integrating AI chatbots in educational environments has proven effective in promoting and improving students' self-regulated learning. Incorporating chatbots within academic libraries is of great significance, as highlighted

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by Kaushal and Yadav (2022), notably in enhancing research efforts and facilitating scholarly collaboration.

However, as AI chatbots' use becomes prevalent, concerns about the potential drawbacks and challenges associated with their usage also arise. Lo and Hew (2023) suggest that using AI chatbots presents technical limitations and concerns about authenticity and student motivation. Moreover, implementing AI technology presents many ethical dilemmas and legal liabilities, most notably academic plagiarism, intellectual property infringement, and the erosion of academic integrity (Yu, 2023). According to Perkins (2023), there is a contention about the possible hazards AI Large Language Models pose concerning preserving academic integrity. While these AI-driven tools can enhance cognitive skill development and foster independent learning, excessive reliance on them may hinder students' ability to think critically, problem-solve, and engage in deep learning. Han *et al*., (2022) highlight the potential for intrusive AI monitoring to disrupt personal autonomy, identity, and educational relationships. Additionally, the potential misuse or overdependence on AI chatbots may restrict students' creativity, limit collaboration and interpersonal skills, and undermine the development of essential competencies necessary for their future careers. As Qian (2021) argues, further potential risks are decision-making mistakes, career substitution, privacy leakage, information cocooning, and data bias.

Numerous reasons justify the need to regulate the use of AI technology in education. The rapid development of chatbots has led to an AI arms race, with varying performance levels among chatbots (Rudolph *et al*., 2023). Ethical implications, such as potential misuse and exploitation, must also be considered (Kooli, 2023). Ethical risks such as educational data security, deconstruction of the teacher-student role structure, and alienation from educational goals are also significant concerns (Bu, 2022). The potential for AI to deviate and become malicious and misuse sensitive data further compounds these risks (Zanetti *et al*., 2020).

Therefore, this research aims to investigate strategies for harmonizing pedagogical innovation and cognitive skill development by regulating graduate students' usage of AI chatbots in higher education. By exploring the current landscape of AI chatbot implementation and identifying the potential benefits, challenges, and risks associated with their use, this study seeks to provide insights into how educators and institutions can effectively integrate and manage AI chatbot usage to maximize their benefits and mitigate their negative impact on graduate students' cognitive development. This study's research question is formulated as follows: What are the strategies for regulating the usage of AI chatbots in higher education to promote pedagogical innovation and enhance cognitive skill development among graduate students? Guided by the above research question, the research objectives of this work are first to unveil the perceptions of lecturers of Zimbabwean universities on the use of artificial intelligence by graduate students. Second, to explore the strategies lecturers of Zimbabwean universities use to ensure effective learning in the face of artificial intelligence.

The rest of this research is structured as follows. The following section presents the literature survey about using AI chatbots in education and its impact on graduate students' cognitive skill development. The third section displays the research methodology. The findings are presented and discussed in the fourth section. Finally, the last section concludes and summarizes the key findings of this work.

## 2.0 LITERATURE

### 2.1 Opportunities and Risks of AI Chatbot Usage in Higher Education

The existing scholarly literature offers divergent perspectives on the impact of AI technology in education. While several studies showcase the potential advantages of incorporating this technology within education, contrasting research findings indicate a contrary perspective.

The study conducted by Kim *et al*., (2021) suggests that the use of AI Chatbots may have the capacity to improve students' English communication skills in the context of learning English as a Foreign Language. According to Annuš (2023), ChatGPT, an innovative chatbot, holds promise in augmenting the educational process through its capacity to deliver tailored instruction and automated evaluation. According to Yang and Evans (2019), integrating AI chatbots in higher education promises to provide customized assistance and facilitate diverse functions within educational institutions. Wu and Yu (2023) have demonstrated that integrating AI Chatbots into educational settings, notably in higher education, has positively affected students' learning results. A plethora of scientific publications provide helpful insights into the influence of AI chatbots on the educational trajectory of postgraduate students in higher education establishments. According to Koivisto (2023), the integration of chatbots into student counseling services has the potential to improve scalability and extend service hours.

Nevertheless, it is imperative to acknowledge that students persist in attaching considerable significance to providing human counseling services. Liu *et al*., (2022) present a newly developed chatbot system that employs artificial intelligence (AI) to customize the learning process, enhance cognitive capacities, and enhance students' acquisition of learning skills. The present investigation involved an examination of the MERLIN Project as done by Mai (2022). This project

aimed to develop a virtual learning assistant by leveraging artificial intelligence chatbot technology.

The study's findings revealed that students perceived the chatbot as advantageous to their educational journey, effectively augmenting their understanding of the subject matter. Pantelić *et al*., (2023) conducted a study examining students' viewpoints on AI chatbots and identified a prevailing tendency among students to employ them for academic purposes. Chen *et al*., (2023) assert that integrating AI Chatbots inside educational environments enhances the quality of learning by providing students with dynamic and engaging experiences, hence facilitating the acquisition of essential subject matter information. Furthermore, these devices hold considerable importance in terms of offering educational resources. Hannan and Liu (2023) highlight the significant contributions of AI technology to higher education. The authors contend that they substantially facilitate and bolster students' learning experiences. Michel-Villarreal *et al*., (2023) suggest that the integration of ChatGPT in the context of higher education offers a multitude of prospective advantages for both students and educators. The benefits include continuous availability and support, personalized guidance and mentorship, and educational resources. Additional opportunities include acquiring language and proficiency in communication, pedagogical aid and support for educators and teaching assistants, innovative and transformative educational experiences, research initiatives, and data analysis.

Moreover, ChatGPT exhibits improved levels of precision and accuracy when addressing queries, creating abstracts, summarizing textual material, and performing a range of academic tasks (Gamage *et al*., 2023). Sullivan *et al*., (2023) assert that ChatGPT presents unique opportunities for enhancing the academic performance of students from various equity groups. Yin *et al*., (2021) conducted a study to examine the impact of a micro-learning system, including chatbot technology, on students' motivation levels and academic accomplishment. According to the authors, integrating AI chatbots into the educational environment is associated with a notable display of proficiency and self-reliance among pupils. As a result, these students demonstrate a diminished requirement for conventional face-to-face teaching. Moreover, these students exhibit a swift acquisition of increased intrinsic motivation.

Furthermore, Wang and colleagues (2023) argue that the incorporation of artificial intelligence (AI) into the context of higher education provides international students with the opportunity to partake in personalized and flexible learning encounters. Moreover, the integration of artificial intelligence contributes to the overall improvement of teaching quality. Furthermore, Yu (2023) argues that artificial intelligence (AI) technology holds considerable potential for education and pedagogy. It involves the establishment of virtual educational environments and the progression of virtual educators. Akiba and Fraboni (2023) assert that integrating AI technology holds significant value for academic counselors, as it can enhance educational equity by empowering individuals individually. Imran and Almusharraf (2023) suggest that integrating AI chatbots can optimize the efficacy of the academic process.

However, chatbots provide additional risks, such as privacy violations and difficulties comprehending complex tasks (Kaushal & Yadav, 2022). In addition, implementing AI technology gives rise to numerous ethical quandaries and legal responsibilities, particularly academic plagiarism, intellectual property rights violations, and academic integrity degradation (Yu, 2023). Perkins (2023) presents a scholarly discourse on the potential risks associated with AI Large Language Models about preserving academic integrity. Similarly, Talaue (2023) argues that using chatbots by student writers presents a possible danger to maintaining intellectual honesty. Moreover, the Wollny *et al*., (2021) study argues that assessing chatbots with implementation goals raises noteworthy research challenges in education. The survey conducted by Michel-Villarreal *et al*., (2023) utilizes an ethnographic approach to examine the various challenges related to using ChatGPT within the context of higher education. The authors specifically focus on the difficulties of academic integrity and quality control.

Moreover, it is imperative to address a range of additional considerations, namely personalized learning, expertise, authority, communication, and collaboration. Furthermore, the incorporation of artificial intelligence (AI) technology in education has given rise to considerable apprehensions regarding the genuineness of students' academic achievements. Gamage *et al*., (2023) have identified ChatGPT as a potential means for participating in academic misconduct. In a similar vein, it is worth noting that ChatGPT presents a plausible worry for upholding academic integrity, explicitly concerning issues such as plagiarism and academic dishonesty (Sullivan *et al*., 2023).

### 2.2 Discussions on the Impact of AI Chatbots on the Cognitive Skill Development of Graduate Students

A range of studies have explored the potential of AI chatbots to enhance cognitive skill development in graduate students. Bii (2013) and Liu *et al*., (2022) emphasize integrating chatbot technology into the learning environment to stimulate cognitive development. Bii (2013) specifically highlights the role of social interaction and cultural tools in this process, while Liu *et al*., (2022) introduce an Artificial Intelligence Based Inquiry Evaluation Student Learning System (AI-IESLS) that uses concept mapping to assess and improve students' understanding. Cao *et al*., (2023) take this further by introducing multi-role chatbots designed to cater to students' psychological needs and

foster engagement in computer science education. Similarly, Choque-Díaz *et al*., (2018) propose a cognitive technology model to enhance academic support services with chatbots, focusing on real-time data processing and customer experience patterns.

Furthermore, Cao *et al*., (2023) explore using multi-role chatbots designed around the principles of Self-Determination Theory, showing their potential to foster engagement, motivation, and inquiry-based learning. Moreover, Huang *et al*., (2019) discuss the implementation of chatbots in a flipped graduate course, highlighting their effectiveness in guiding knowledge exploration, facilitating case study elaboration, and providing bibliographic support. Fryer *et al*., (2019) examine chatbots as language learning partners, finding that prior interest in human conversation partners and language competency are predictors of interest in chatbot conversations. Furthermore, Mai (2022) presents the Merlin Project, which utilizes an AI chatbot as a virtual learning assistant. It improves students' understanding of course material and enhances their online learning experiences. Hobert (2023) suggests that digital tutors can effectively provide individualized guidance in moments of need and offer high learning satisfaction in a long-term learning setting. Kim (2021) and Yin *et al*., (2021) reported the positive effects of AI chatbots on students' speaking performance and learning motivation. Kim (2021) found that AI voice-chatting can improve speaking performance, while Yin *et al*., (2021) found that chatbot-based micro-learning can enhance intrinsic motivation.

The above studies collectively suggest that AI chatbots can be a valuable tool for stimulating cognitive skill development in graduate students, mainly when designed to cater to their specific needs and learning styles.

However, various studies found opposite results. According to Huseynov (2023), exposure to AI debates can reduce students' confidence in their future earnings, particularly in non-STEM (STEM standing for science, technology, engineering, or mathematics) fields and among non-male students. Rudolph *et al*., (2023) further complicate the picture by suggesting that the current generation of chatbots may not be as intelligent as claimed, raising questions about their effectiveness in education. Moreover, Han *et al*., (2022) highlight the potential for intrusive AI monitoring to disrupt personal autonomy, identity, and educational relationships. Qian (2021) further underscores the risks of decision-making mistakes, career substitution, privacy leakage, information cocooning, and data bias. These concerns are particularly relevant in the context of student privacy and data protection (Huang, 2023). Yu (2022) emphasizes the need for a prevention mechanism to address the risk of ideological manipulation through intelligent algorithms.

In summary, the existing literature on the impact of AI chatbots on the cognitive skill development of graduate students highlights positive and negative effects. However, very few scholars investigated the strategies to integrate AI chatbots into education without compromising the cognitive skill development of graduate students. This study attempts to fill a massive gap in the literature. It is crucial to redefine teachers' duties, educate students on the responsible use of AI, and regulate its deployment in education (Bu, 2022). Additionally, a balance between the benefits and risks of AI in education must be maintained, with a need for global regulation and responsibility (Berendt *et al*., 2020).

### 2.3 The Role of AI Chatbot in Boosting Graduate Students' Cognitive Skill Development: The Vygotskian Sociocultural Theory

The Vygotskian sociocultural emphasizes the role of social interaction and cultural context in cognitive development. According to Vygotsky and Col (1978), learning is a collaborative process through interactions with more knowledgeable individuals and the cultural tools available in a given context. This research argues that regulating the usage of AI chatbots should focus on creating a conducive social and cultural learning environment that promotes cognitive skill development. It includes fostering meaningful interactions between graduate students, educators, and AI chatbots to facilitate knowledge construction, problem-solving, and critical thinking.

In addition, the sociocultural theory also recognizes the importance of the Zone of Proximal Development (ZPD), which refers to the gap between a student's actual developmental level and their potential level of development with guidance and support (Czikszentmihalyi, 1990). In the context of AI chatbots, the ZPD is the balance between allowing students to engage with the chatbots independently and providing appropriate guidance and supervision to ensure their cognitive skills are nurtured.

Furthermore, the concept of scaffolding from the sociocultural theory can be applied to regulate the usage of AI chatbots. Scaffolding involves providing temporary support and guidance to students to help them accomplish tasks that they cannot yet do independently (Van Lier, 1996). In this case, educators can guide students in effectively utilizing AI chatbots to enhance their learning experiences and cognitive skill development while gradually reducing the level of support as students become proficient.

A body of education research used the above theory in different contexts. Bakare and Jatto (2023) relied on Vygotskian sociocultural theory to investigate the impact of AI chatbots on student learning outcomes and engagement. Similarly, Al-Hoorie *et al*., (2021) used the same theory to explore the contribution of language

motivation research to language teaching practice. Moreover, Krullaars *et al*., (2023) analyzed student-AI relationships in high school using Vygotskian sociocultural theory. Additionally, Mørch and Andersen (2023) used the same theory to explore the use of human-centered AI in the education sector.

By employing the Vygotskian sociocultural theory as a theoretical framework, this research can offer insights into the strategies to regulate graduate students' usage of AI chatbots to ensure a harmonious integration of pedagogical innovation and cognitive skill development in higher education.

## 3.0 METHODOLOGY

The study seeks to understand lecturers' perceptions of students' use of artificial intelligence in Zimbabwean universities and explore the strategies to regulate graduate students' use of AI. The above objectives are appropriately aligned with qualitative research studies. Therefore, for this study, qualitative methodologies were chosen. The study population was all lecturers in Zimbabwean state universities. The study focused on eleven Zimbabwean state universities, which are Zimbabwe Open University, Harare Institute of Technology, Manicaland State University, Chinhoyi University of Technology, Lupane State University, University of Zimbabwe, National University of Science and Technology, Great Zimbabwe University, Gwanda State University, Midlands State University, and Marondera University of Agricultural Sciences and Technology.

The study adopted a mixture of convenient sampling and snowball sampling. Convenient sampling was used in only interviewing lecturers who were free to be interviewed, and those who were busy were not disturbed. Snowball sampling was used as the interviewees referred the investigators to other lecturers to contribute to the research. The data saturation was reached at the 12$^{th}$ interviewee, and interviews were immediately stopped to save time and resources. The investigation used a mixture of telephone interviews and face-to-face interviews. Interviews (five interviews) with Harare were done face to face. It was pivotal as the researcher would tap into the non-verbal cues. However, the other seven interviews were conducted via telephone because the respondents were outside Harare. After two weeks, interviews were performed twice with the same participants to ensure data trustworthiness (credibility, transferability, confirmability, and dependability). Interviews were first carried out on December, 1rst 2023, and the second interviews were carried out on December 15$^{th}$, 2023. On both occasions, interviews were consistent in terms of their responses.

Data analysis was conducted using thematic coding via NVivo14. Open coding was done by identifying the frequently used phrases in interviews as themes. After that, axial coding was done to check each theme's causes, effects, and strategies. The analysis ended with selective coding, combining some themes based on their similarities. Ethics was not an issue as lecturers interviewed were alerted of their rights to withdraw from the study whenever they wished.

## 4.0 RESULTS AND DISCUSSIONS

### 4.1 Perceptions of Zimbabwean Universities' Lecturers on the Use of Artificial Intelligence by Graduate Students

Research shows that there are both negative and positive perceptions of lecturers towards using artificial intelligence by graduate students in Zimbabwean state universities. Five themes emerged on negative perceptions of lecturers towards student use of artificial intelligence.

#### 4.1.1 Negative perceptions

The first theme that emerged is the abuse of artificial intelligence. The study found that students need to rely more on using artificial intelligence. Participant II stated that:

> *"Students have a problem; instead of using chatbots for studying, they now use it to do tasks for them."*

This finding resonates with Akiba & Fraboni (2023), that graduate students are using AI chatbots to write for their assignments. It is cheating and academic fraud. However, this is wider than assignment writing. This study found that graduate students write their research projects using artificial intelligence. It emanated from several participants, including Participant V, who stated:

> *"This has become too much; students are no longer doing research projects…..they use chatbots to write the whole research report."*

This finding differs from Al-Hoorie *et al*., (2021), as lecturers can detect the use of artificial intelligence in their context. However, this is impossible in Zimbabwe as lecturers have constraints in using artificial intelligence in research projects, dissertations, and theses.

The second theme that emerged from this investigation is cheating and plagiarism. Graduate Students are cheating in universities due to the emergence of artificial intelligence. Participant VIII highlighted that:

> *"Many students with access to artificial intelligence cheat in assignments, online examinations, and research projects."*

This finding is similar to Han *et al*., (2022), who reported massive cases of cheating and plagiarism due to the use of artificial intelligence. However, this diverges from Mai (2022), who focused on engineering students whose assignments required face-to-face examination of assignments.

The study also found that using artificial intelligence by Zimbabwean graduate students results in half-backed students. It was stated by Participant X, who said:

*"Our students lack critical thinking, problem-solving, and practical skills due to over-reliance on artificial intelligence."*

This finding differs from Lo & Hew (2023), who found that problem-solving skills were improving due to using artificial intelligence. The difference is that contrary to the findings of Lo & Hew (2023), students do not abuse artificial intelligence. The study also found that artificial intelligence has resulted in reduced student interaction. Participant, I highlighted that:

*"Students used to do discussions in preparation for examinations to arm each other with information……this has reduced with artificial intelligence as students revise using AI chatbots."*

This finding deviates from Koivisto (2023) as his study was in the Western world, where there is more individualism, which is fine. However, in Africa, collectivism is essential; hence, reduced interaction becomes a problem.

The last negative perception and third theme is ethical implications. For example, Participant XII said this:

*"Use of artificial intelligence results in students manipulating facts and data in their assignments and projects."*

This finding is similar to Hobert's (2023) that students manipulate data using artificial intelligence, and data manipulation is an ethical issue. It also resonates with Kim *et al*., (2021), who argue that many students use artificial intelligence to misrepresent facts in their assignments and research projects.

**4.1.2 Positive Perceptions**

The study also shows lecturers' positive perceptions of using artificial intelligence by students in Zimbabwean universities. However, all the positive perceptions revolved around the flexibility and cheapness of research, which are the fourth and fifth themes. For example, Participant I stated that:

*"Our students have been finding it expensive to find research resources to prepare them for examinations…..however, artificial intelligence presents a cheap alternative that students can access for research."*

It, however, is not detected in a study by Liu *et al*., (2022), as students in China have access to research. Similarly to Han *et al*., (2022), research resources are not an issue in Europe, and this was not detected as a positive for using artificial intelligence. Furthermore, the study found that using artificial intelligence gives students flexibility. For example, Participant VII stated that:

*"Our students can research using these chatbots anywhere at any time whenever they want to study for their examinations."*

This finding is similar to Hannan & Liu's (2023) finding that artificial intelligence results in study and research flexibility amongst students. Mai (2022) states that artificial intelligence chatbots are convenient for students.

**4.2 Strategies Used by Zimbabwean Universities' Lecturers to Ensure Effective Learning in the Face of Artificial Intelligence**

Research in Zimbabwean state universities shows that strategies to curb students' use of artificial intelligence can be categorized into two. Lecturers adopt some strategies, while some methods are adopted at the university level.

**4.2.1 Lecturers' Strategies**

Two themes emerged about lecturers' strategies to curb students' use of artificial intelligence. The first theme that emerged is active learning. Lecturers are adopting active learning strategies such as in-class discussions. For example, Participant II stated this:

*"I am now emphasizing students coming to class doing role play…..this helps make students develop problem-solving skills that might have been hindered by artificial intelligence."*

This finding is similar to Lo & Hew (2023), who encouraged active learning to ensure that the quality of graduates was not compromised in the age of artificial intelligence. Kim (2021) also emphasizes that active learning is highly needed, given the threat of artificial intelligence. The second lecturer's strategy is to tailor-make coursework. Some lecturers stated that they are doing away with written assignments. For example, Participant IV noted that;

*"I am no longer giving my students assignments; they now write in-class tests and do class presentations……these are face-to-face. There is no room for students to cheat by using artificial intelligence."*

This finding needs to be detected by Lo & Hew (2023) as assignment writing remains the most used assessment tool in universities across the globe. Other lecturers stated that they have not removed assignments but have reduced the percentage contribution of assignments on the overall task of students. It was emphasized by Participant III, who said:

*"I still give assignments to my students, but presentations and in-class tests have more contribution on the overall assessment of my students than the assignments because they are not credible as many students use AI chatbots."*

These findings also deviate from several studies (Liu *et al*., 2022; Koivisto, 2023; Mai, 2022). The reason

is that assignments are significant student assessments in universities worldwide.

#### 4.2.2 University-Level Strategies

Apart from lecturers' strategies, Zimbabwean state universities use university-level strategies in light of artificial intelligence. One of the strategies being used by Zimbabwean state universities is the use of viva voce. Universities no longer trust student's research projects, dissertations, and theses. After students submit their research reports, they are subjected to Viva Voce to investigate if they are the ones who did the research and if they learned any skills. For example, Participant IX stated this:

> *"All our research students have to defend their proposals and projects so that we prove that they are the ones who did the research."*

This study's finding differs from many studies (Mai, 2022; Kim *et al*., 2021; Hobert, 2023). The results highlight that many universities only subject DPhil students to Viva Voce. Master and undergraduate students are not subjected to Viva Voce, which makes this finding peculiar. Another university strategy for discouraging the use of artificial intelligence in assessments is using artificial intelligence detectors. It was emphasized by Participant V:

> *"We are using Turnitin; all assignments and research projects should be entered into the system……..once the use of AI is detected, the student cannot submit for marking."*

However, some participants, such as Participant X and Participant XII, stated that turning in is expensive and that their universities need help to afford it, given the current economic difficulties in Zimbabwe. However, the finding resonates with many studies (Kim, 2021; Liu *et al*., 2022; Hannan & Liu, 2023), as many universities use artificial intelligence software detectors to discourage students from using artificial intelligence in their assignments and research projects.

In summary, the findings revealed both positive and negative perspectives. The negative perceptions included the abuse of AI, cheating and plagiarism, half-backed students, reduced interaction, and ethical implications. Graduate students were found to need more support on AI, resulting in reduced critical thinking, problem-solving, and practical skills. Additionally, students were found to be manipulating facts and data using AI, which is an ethical issue. On the other hand, lecturers identified positive aspects of AI usage, including flexibility and cheapness of research resources.

To regulate graduate students' use of AI in higher education, lecturers adopted active learning strategies such as in-class discussions and tailor-made coursework. Some universities also implemented university-level strategies such as Viva Voce and AI software detectors to discourage students from using AI in assessments. These findings differed from studies conducted in Western countries, as African collectivism values interaction and practical skills development more than individualism and assignment writing.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

This study investigated the perceptions of Zimbabwean lecturers towards graduate students' use of AI chatbots and explored the strategies to regulate their usage in higher education. The findings revealed that while AI chatbots present potential advantages in enhancing cognitive skill development, they pose challenges such as cheating, plagiarism, and reduced interaction. Lecturers have adopted strategies such as active learning and tailor-made coursework, while universities have implemented Viva Voce and AI software detectors to discourage cheating.

### 5.1 Theoretical Contributions

This study contributes to the existing literature on AI chatbots in education by providing insights into the perspectives of Zimbabwean lecturers. The study highlights the importance of cultural and social factors in integrating AI technology. It offers valuable insights into how educators and institutions can effectively integrate and manage AI chatbot usage to maximize their benefits and mitigate their negative impact on graduate students' cognitive development.

### 5.2 Managerial Implications

The findings from this study have practical implications for educators and higher education institutions. The study suggests that universities should invest in AI software detectors to detect cheating and plagiarism. Moreover, universities can encourage active learning strategies, such as in-class discussions and tailor-made coursework, to develop critical thinking, problem-solving, and practical skills among graduate students. Also, lecturers should encourage students to use artificial intelligence for research and study as it is cheap and flexible.

### 5.3 Limitations of the Study and Further Research Dimensions

This study has some limitations. Firstly, the study only captures lecturers' perceptions rather than graduate students. Secondly, future research can explore the long-term impact of AI chatbot usage on graduate students' cognitive skill development and engagement. Finally, future research can examine AI chatbots' legal and ethical educational implications.

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## REFERENCES


- Akiba, D., & Fraboni, M. C. (2023). AI-Supported Academic Advising: Exploring ChatGPT's Current

State and Future Potential toward Student Empowerment. *Education Sciences*, *13*(9), 885.

- Al-Hoorie, A. H., Hiver, P., Kim, T. Y., & De Costa, P. I. (2021). The identity crisis in language motivation research. *Journal of Language and Social Psychology*, *40*(1), 136-153.
- Annuš, N. (2023). Chatbots in Education: The impact of Artificial Intelligence based ChatGPT on Teachers and Students. *International Journal of Advanced Natural Sciences and Engineering Researches*, *7*(4), 366-370.
- Bakare, O. D., & Jatto, O. V. (2023). The Potential Impact of Chatbots on Student Engagement and Learning Outcomes. In *Creative AI Tools and Ethical Implications in Teaching and Learning* (pp. 212-229). IGI Global.
- Berendt, B., Littlejohn, A., & Blakemore, M. (2020). AI in education: Learner choice and fundamental rights. *Learning, Media and Technology*, *45*(3), 312-324.
- Bii, P. (2013). Chatbot technology: A possible means of unlocking student potential to learn how to learn. *Educational Research*, *4*(2), 218-221.
- Bu, Q. (2022). Ethical Risks in Integrating Artificial Intelligence into Education and Potential Countermeasures. *Science Insights*, *41*(1), 561-566.
- Cao, C. C., Ding, Z., Lin, J., & Hopfgartner, F. (2023). AI Chatbots as Multi-Role Pedagogical Agents: Transforming Engagement in CS Education. *arXiv preprint arXiv:2308.03992*.
- Chan, C. K. Y., & Tsi, L. H. (2023). The AI Revolution in Education: Will AI Replace or Assist Teachers in Higher Education?. *arXiv preprint arXiv:2305.01185*.
- Chang, D. H., Lin, M. P. C., Hajian, S., & Wang, Q. Q. (2023). Educational Design Principles of Using AI Chatbot That Supports Self-Regulated Learning in Education: Goal Setting, Feedback, and Personalization. *Sustainability*, *15*(17), 12921.
- Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial Intelligence trends in education: a narrative overview. *Procedia Computer Science*, *136*, 16-24.
- Chen, Y., Jensen, S., Albert, L. J., Gupta, S., & Lee, T. (2023). Artificial intelligence (AI) student assistants in the classroom: Designing chatbots to support student success. *Information Systems Frontiers*, *25*(1), 161-182.
- Choque-Díaz, M., Armas-Aguirre, J., & Shiguihara-Juárez, P. (2018, August). Cognitive technology model to enhance academic support services with chatbots. In *2018 IEEE XXV International Conference on Electronics, Electrical Engineering and Computing (INTERCON)* (pp. 1-4). IEEE.
- Czikszentmihalyi, M. (1990). Flow: The psychology of optimal experience.
- Fryer, L. K., Nakao, K., & Thompson, A. (2019). Chatbot learning partners: Connecting learning experiences, interest and competence. *Computers in human Behavior*, *93*, 279-289.
- Gamage, K. A., Dehideniya, S. C., Xu, Z., & Tang, X. (2023). ChatGPT and higher education assessments: more opportunities than concerns?. *Journal of Applied Learning and Teaching*, *6*(2).
- Han, B., Buchanan, G., & Mckay, D. (2022, November). Learning in the Panopticon: Examining the Potential Impacts of AI Monitoring on Students. In *Proceedings of the 34th Australian Conference on Human-Computer Interaction* (pp. 9-21).
- Hannan, E., & Liu, S. (2023). AI: new source of competitiveness in higher education. *Competitiveness Review: An International Business Journal*, *33*(2), 265-279.
- Hobert, S. (2023). Fostering skills with chatbot-based digital tutors–training programming skills in a field study. *i-com*, (0).
- Huang, L. (2023). Ethics of artificial intelligence in education: Student privacy and data protection. *Science Insights Education Frontiers*, *16*(2), 2577-2587.
- Huang, W., Hew, K. F., & Gonda, D. E. (2019). Designing and evaluating three chatbot-enhanced activities for a flipped graduate course. *International Journal of Mechanical Engineering and Robotics Research*.
- Huseynov, S. (2023). ChatGPT and the Labor Market: Unraveling the Effect of AI Discussions on Students' Earnings Expectations. *arXiv preprint arXiv:2305.11900*.
- Imran, M., & Almusharraf, N. (2023). Analyzing the role of ChatGPT as a writing assistant at higher education level: A systematic review of the literature. *Contemporary Educational Technology*, *15*(4), ep464.
- Kaushal, V., & Yadav, R. (2022). The role of chatbots in academic libraries: An experience-based perspective. *Journal of the Australian Library and Information Association*, *71*(3), 215-232.
- Kim, H. S. (2021). Is it beneficial to use AI chatbots to improve learners' speaking performance?. *Journal of Asia TEFL*, *18*(1), 161-178.
- Kim, H. S., Cha, Y., & Kim, N. Y. (2021). Effects of AI chatbots on EFL students' communication skills. *영어학*, *21*, 712-734.
- Koivisto, M. (2023). Tutoring Postgraduate Students with an AI-Based Chatbot. *International Journal of Advanced Corporate Learning*, *16*(1), 41.
- Kooli, C. (2023). Chatbots in education and research: A critical examination of ethical implications and solutions. *Sustainability*, *15*(7), 5614.
- Krullaars, Z. H., Januardani, A., Zhou, L., & Jonkers, E. (2023). Exploring Initial Interactions: High School Students and Generative AI Chatbots for Relationship Development.
- Liu, L., Subbareddy, R., & Raghavendra, C. G. (2022). AI Intelligence Chatbot to Improve Students

Learning in the Higher Education Platform. *Journal of Interconnection Networks*, *22*(Supp02), 2143032.

- Lo, C. K., & Hew, K. F. (2023, May). A review of integrating AI-based chatbots into flipped learning: new possibilities and challenges. In *Frontiers in Education* (Vol. 8, p. 1175715). Frontiers.
- Mageira, K., Pittou, D., Papasalouros, A., Kotis, K., Zangogianni, P., & Daradoumis, A. (2022). Educational AI chatbots for content and language-integrated learning. *Applied Sciences*, *12*(7), 3239.
- Mai, N. E. O. (2022). The Merlin project: Malaysian students' acceptance of an ai chatbot in their learning process. *Turkish Online Journal of Distance Education*, *23*(3), 31-48.
- Michel-Villarreal, R., Vilalta-Perdomo, E., Salinas-Navarro, D. E., Thierry-Aguilera, R., & Gerardou, F. S. (2023). Challenges and Opportunities of Generative AI for Higher Education as Explained by ChatGPT. *Education Sciences*, *13*(9), 856.
- Mørch, A. I., & Andersen, R. (2023). Human-Centred AI in Education in the Age of Generative AI Tools. *Proceedings http://ceur-ws. org ISSN*, *1613*, 0073.
- Pantelić, N., Milošević, M., & Marković, V. B. (2023). Using AI chatbots in academia- the opinions of university students, *SINTEZA*.
- Perkins, M. (2023). Academic Integrity considerations of AI Large Language Models in the post-pandemic era: ChatGPT and beyond. *Journal of University Teaching & Learning Practice*, *20*(2), 07.
- Qian, Z. (2021, June). Applications, Risks and Countermeasures of Artificial Intelligence in Education. In *2021 2nd International Conference on Artificial Intelligence and Education (ICAIE)* (pp. 89-92). IEEE.
- Rudolph, J., Tan, S., & Tan, S. (2023). War of the chatbots: Bard, Bing Chat, ChatGPT, Ernie and beyond. The new AI gold rush and its impact on higher education. *Journal of Applied Learning and Teaching*, *6*(1).
- Sullivan, M., Kelly, A., & McLaughlin, P. (2023). ChatGPT in higher education: Considerations for academic integrity and student learning.
- Talaue, F. G. (2023). Dissonance in generative AI use among student writers: How should curriculum managers respond?. In *E3S Web of Conferences* (Vol. 426, p. 01058). EDP Sciences.
- Van Lier, L. (1996). *Interaction in the curriculum: Awareness, autonomy & authenticity*. London: Addison Wesley Longman.
- Vygotsky, L. S., & Cole, M. (1978). *Mind in society: Development of higher psychological processes*. Harvard University Press.
- Wang, T., Lund, B. D., Marengo, A., Pagano, A., Mannuru, N. R., Teel, Z. A., & Pange, J. (2023). Exploring the Potential Impact of Artificial Intelligence (AI) on International Students in Higher Education: Generative AI, Chatbots, Analytics, and International Student Success. *Applied Sciences*, *13*(11), 6716.
- Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are we there yet? A systematic literature review on chatbots in education. *Frontiers in artificial intelligence*, *4*, 654924.
- Wu, R., & Yu, Z. (2023). Do AI chatbots improve students learning outcomes? Evidence from a meta-analysis. *British Journal of Educational Technology*.
- Yang, S., & Evans, C. (2019, November). Opportunities and challenges in using AI chatbots in higher education. In *Proceedings of the 2019 3rd International Conference on Education and E-Learning* (pp. 79-83).
- Yin, J., Goh, T. T., Yang, B., & Xiaobin, Y. (2021). Conversation technology with micro-learning: The impact of chatbot-based learning on students' learning motivation and performance. *Journal of Educational Computing Research*, *59*(1), 154-177.
- Yu, H. (2023). Reflection on whether Chat GPT should be banned by academia from the perspective of education and teaching. *Frontiers in Psychology*, *14*, 1181712.
- Yu, H. Y. (2022). Intelligent Algorithm Risk and Prevention Mechanism of College Students' Ideology under the Background of Artificial Intelligence. *Scientific Programming*, *2022*.
- Zanetti, M., Rendina, S., Piceci, L., & Cassese, F. P. (2020). Potential risks of artificial intelligence in education. *Form@ re-Open Journal per la formazione in rete*, *20*(1), 368-378.

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