trends in higher education

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Lecturers' Perceptions on the Integration of Artificial Intelligence Tools into Teaching Practice

Murimo Bethel Mutanga *, Vikash Jugoo and Kuburat Oyeranti Adefemi

Department of Information and Communication Technology, Mangosuthu University of Technology, Umlazi, Durban 4026, South Africa; vikash@mut.ac.za (V.J.); adefemi.kuburat@mut.ac.za (K.O.A.)
* Correspondence: mutangamb@mut.ac.za

Abstract: Higher education has witnessed a massive transformation due to the advent of generative artificial intelligence (AI) technologies such as ChatGPT. In essence, AI has transformed various aspects of society as a whole. Despite the growing interest in applying AI tools such as ChatGPT in higher education, there is limited understanding of lecturers' perceptions regarding their use in teaching and learning contexts. Studies reported in the literature have not comprehensively explored lecturers' attitudes towards AI adoption, particularly in terms of its impact on classroom activities, assessment, and feedback. This study aims to fill this gap by qualitatively studying lecturers' perspectives. The findings reveal that the advent of AI was met with mixed feelings among lecturers. Some lecturers embraced AI technologies and developed mechanisms for utilizing them in the classroom, while others resisted the change. This research is significant, as it can inform best practices and guide future implementation strategies of technologies in education.

Keywords: ChatGPT; higher education; artificial intelligence; lecturer perceptions; teaching practices

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Citation: Mutanga, M.B.; Jugoo, V.; Adefemi, K.O. Lecturers' Perceptions on the Integration of Artificial Intelligence Tools into Teaching Practice. *Trends High. Educ.* **2024**, *3*, 1121–1133. https://doi.org/10.3390/higheredu3040066

Academic Editor: Oriol Borrás-Gené

Received: 24 August 2024
Revised: 4 December 2024
Accepted: 9 December 2024
Published: 13 December 2024

1. Introduction

AI tools have become increasingly sophisticated and accessible due to the advent of generative AI tools such as ChatGPT. Consequently, their potential to enhance teaching and learning processes has gathered significant attention from educators and researchers [1]. Notably, AI tools are transforming education by offering personalized learning systems and real-time feedback and automating administrative tasks [2]. As a result, this transformation allows educators to focus on student-centered interaction and tailored educational experiences. Despite these potential advancements, integrating AI into educational settings presents significant challenges [3]. These include ethical considerations [4], data privacy, and the need for educators to adapt their teaching methods to effectively utilize new technologies [5]. These challenges can potentially affect how educators perceive and subsequently integrate AI technologies into their teaching practice.

Investigating AI's role in education is crucial, as it has the potential to revolutionize teaching practices and improve student engagement and outcomes. However, there is a limited understanding of the effects of AI across different educational contexts and disciplines [6]. While existing research often highlights AI's benefits [7], it frequently overlooks the perceptions and impacts on both educators and students. Addressing this gap is essential for developing strategies that maximize AI's advantages while mitigating its drawbacks.

Therefore, this study aims to explore lecturers' perceptions across a range of disciplines at a University of Technology in South Africa. To achieve this, we employed a qualitative research approach, including semi-structured interviews with lecturers from diverse departments such as Engineering, Information Technology, Business Management, and Health Sciences. This study, therefore, poses the following research questions:

- What are lecturers' perceptions of the advantages and challenges associated with incorporating AI tools into their teaching practices?

- How do lecturers perceive the role of AI tools in teaching and learning processes?

The rest of the paper is structured as follows: Section 2 presents the review of related work, while the methodology is given in Section 3. Section 4 presents the findings, and discussion of the results are presented in Section 5. The paper concludes by outlining recommendations and suggestions for future studies in Section 6.

2. Literature Review

2.1. Lecturers' Attitudes and Perceptions Towards AI

The integration of AI into higher education has elicited a range of responses from lecturers, with a predominant inclination towards acceptance tempered by cautious optimism. Ofosu-Ampong et al. [8] presented a compelling narrative where university lecturers displayed a notable willingness to embrace AI for their students. This openness is not without its challenges; it is heavily influenced by several critical factors. The study revealed that lecturers' acceptance of AI hinges on organizational policies that support AI integration, the perceived complexity and ease of use of AI tools, and their pedagogical affordances. Additionally, the socio-cultural context within the institution and the availability of professional development opportunities plays pivotal roles. This multi-faceted perspective underscores that while lecturers are generally optimistic about AI's potential to enhance teaching and learning, their readiness to adopt these technologies is contingent upon institutional support structures and the tangible benefits these tools offer in an educational setting [9].

Shakib Kotamjani et al. [10] provided an insightful examination of faculty members' perceptions of AI, chatbots, and generative AI within the higher education landscape in Uzbekistan. This study painted a diverse picture of attitudes, ranging from enthusiasm about AI's innovative capabilities to apprehensions regarding its impact on the teaching profession and student engagement. The same observations were made by Mwalongo and Mkonongwa [11] when they investigated lecturer perceptions regarding support for information and communication technology (ICT) integration into teaching and learning within higher education institutions in Tanzania. The findings suggested that while there is a general eagerness to explore AI's potential, there are significant concerns about its implications, particularly regarding the preservation of the human elements in teaching. This highlights a broader trend where the acceptance of AI is closely linked to individual and institutional readiness to navigate the complexities of integrating new technologies into traditional educational paradigms. This is not new phenomenon, as earlier technologies such as online learning has been met with the same skepticism.

2.2. Factors Influencing AI Adoption

The adoption of AI in the classroom is shaped by a complex interplay of factors that go beyond mere technological feasibility. Institutional support stands at the forefront, where a strong commitment from the administration lays the groundwork for AI integration. This support signals to educators and students alike that the institution values innovation and is willing to invest in its future [12]. Equally critical is the focus on faculty training and development; educators must learn to use AI tools and understand how to integrate them into their pedagogical practices effectively. In general, for training programs to be effective, they ought to be tailored to the specific needs of educators [8].

The attitudes of educators towards technology profoundly influence AI adoption. An environment that fosters openness and curiosity towards new technological advancements encourages educators to experiment and innovate in their teaching methods [13]. Meanwhile, the compatibility of AI tools with the existing curriculum is essential. AI must seamlessly blend with educational objectives and content, enhancing rather than disrupting the learning process. The seamless integration is still a challenge due to the rapid developments and evolution of AI technologies [14].

Ethical concerns also present significant hurdles. Educators and institutions must navigate the complexities of the ethical implications of AI use, ensuring that AI applications

are used responsibly [3,5,15]. Together, these factors create a multi-faceted landscape that influences the successful integration of AI in educational settings, highlighting the need for a balanced and thoughtful approach.

While AI has shown significant potential globally, limited research has explored its adoption and perceptions, specifically within teaching practices. This study highlights challenges such as the cultural adaptation of AI tools and the concerns related to their integration. Additionally, there is a gap in understanding the readiness and training of lecturers in effectively utilizing AI tools, particularly ChatGPT, in their teaching practices.

2.3. Technology Acceptance Models (TAM) in AI Adoption

The Technology Acceptance Model (TAM), developed by Davis (1989), is a foundational framework for understanding technology adoption, emphasizing Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU refers to the belief that technology improves performance, while PEOU relates to the ease of using the technology. For lecturers, AI tools like ChatGPT may be adopted if they perceive clear benefits, such as enhanced teaching efficiency and personalized feedback for students, and if the tools are user-friendly.

TAM2, introduced by Venkatesh and Davis (2000), expands on the original model by including social influence and cognitive instrumental processes. Social influence such as peer recommendations and institutional policies and cognitive factors like task relevance and demonstrable benefits shape lecturers' perceptions of AI. These factors are particularly significant in educational contexts, where collaboration and institutional directives often guide technology adoption.

TAM3, proposed by Venkatesh and Bala (2008), adds factors influencing PEOU, such as technology self-efficacy, external control (availability of resources and support), and technology anxiety. For South African lecturers, limited training opportunities or apprehensions about AI replacing human roles could act as barriers, while robust support systems can encourage adoption.

The Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), synthesizes elements from TAM and other models, identifying performance expectancy, effort expectancy, social influence, and facilitating conditions as key determinants of technology adoption. UTAUT highlights the importance of institutional support, such as training programs, policies, and infrastructure, in facilitating the integration of AI tools in teaching.

These models collectively underscore the interplay between perceived benefits, ease of use, social influences, and external support in shaping technology adoption. While TAM has been widely applied, its use in studying AI adoption in South African higher education remains limited. By applying TAM and its extensions, this study seeks to understand the factors influencing lecturers' perceptions and adoption of AI tools like ChatGPT, addressing the unique challenges and opportunities of AI integration in education.

3. Methodology

3.1. Research Design

This study employed a qualitative research design to explore the responses of lecturers to the introduction of ChatGPT and other AI tools in academic settings. The primary method of data collection was semi-structured interviews, allowing for in-depth exploration of lecturers' perspectives and experiences. Thematic analysis was used to analyze the data, identifying key themes and patterns in the responses. The study was conducted at a University of Technology. Participants included lecturers from various departments within the university. To ensure diverse perspectives, at least five staff members from each department were interviewed. The departments represented in the study included Engineering, Information Technology, Business Management, and Health Sciences. The choice of the methods was informed by recommendations suggested by Hennick et al. [16].

3.2. Data Collection

The primary data collection method for this study was semi-structured interviews. This method was chosen because it allows for in-depth exploration of lecturers' perspectives, providing flexibility in how participants respond while still focusing on key topics relevant to the research. Semi-structured interviews are particularly effective for qualitative studies, where understanding individual experiences, attitudes, and opinions is essential [17]. This method also provides the opportunity to follow up on responses and probe deeper into participants' thoughts, which is vital in exploring complex issues such as the adoption of AI tools like ChatGPT in teaching practices.

By using semi-structured interviews, the researcher can capture a wide range of experiences and viewpoints [18], which is crucial for this study, as lecturers' perceptions can differ significantly based on their academic background, teaching styles, and departmental context. Additionally, the semi-structured format allows for some level of flexibility, enabling the researcher to adapt the interview process based on participants' responses, ensuring that all aspects of their perspectives are adequately explored. The data were collected over a period of six months.

3.2.1. Participant Selection

Participants were drawn from a range of academic departments at the University of Technology to ensure diverse perspectives. Five lecturers from each department were interviewed, making a total of 25 participants. The departments included in the study were Engineering, Information Technology, Business Management, and Health Sciences. This selection aimed to capture a variety of experiences with AI tools across different teaching contexts. The inclusion of multiple disciplines ensures that the study provides a comprehensive understanding of the lecturers' views on AI adoption and use.

3.2.2. Interview Process

Each interview was designed to last between 45 min and 1 h. The interviews were conducted either in person or via video conferencing, depending on the participants' availability and preference. This flexibility was crucial in ensuring that all lecturers had the opportunity to participate, even those with scheduling constraints. Interviews were conducted in a comfortable, quiet setting, whether physical or virtual, to ensure that participants felt at ease and were able to express their opinions freely. This approach minimized distractions and encouraged openness, which is particularly important when discussing potentially sensitive topics like changes in teaching practices due to new technologies. The semi-structured interview guide included open-ended questions designed to explore key themes, such as the following:

- Lecturers' familiarity with AI tools (like ChatGPT);
- The perceived benefits and challenges of using AI tools in teaching and assessment;
- Concerns regarding the impact of AI on teaching practices and academic integrity;
- How AI tools have influenced classroom activities, including content delivery, feedback, and student engagement.

All interviews were audio-recorded (with participants' consent) to ensure accuracy in capturing responses. This also allowed for thorough analysis during the later stages of data processing. Notes were taken during the interviews to capture non-verbal cues and immediate impressions that could inform the thematic analysis.

3.3. Data Analysis

The analysis of the interview data was carried out using thematic analysis, a method that allows for the identification, analysis, and reporting of patterns within qualitative data [19]. Thematic analysis was chosen because it is particularly well suited for exploring lecturers' perceptions of AI tools like ChatGPT, which can involve complex and varied responses. The method provides flexibility while ensuring that the analysis remains

systematic and grounded in the data, enabling a thorough examination of the interview responses [20].

3.3.1. Familiarization

The analysis process began with familiarization with the data, a crucial first step in ensuring a comprehensive understanding of the content before proceeding with coding. The audio-recorded interviews were transcribed verbatim, and the researcher read through each transcript multiple times. This repetition allowed for an immersion in the data, ensuring that key ideas and subtle nuances from the lecturers' responses were not overlooked [21]. By becoming intimately familiar with the content, the researcher was able to gain an initial understanding of the lecturers' views, which informed the next stages of the analysis.

During this phase, the researcher also made initial notes on key impressions, recurring ideas, and any potential patterns that emerged across the interviews. This provided a preliminary sense of what themes might be present in the data, such as attitudes toward AI integration, challenges associated with using AI tools, and the potential impact on teaching and learning activities. This first pass through the data laid the foundation for the subsequent steps of coding and theme development.

3.3.2. Coding

The coding process employed an inductive approach, allowing themes to emerge directly from the data to ensure the analysis was grounded in the participants' experiences and perspectives. The coding was conducted manually, and a codebook was developed. The comprehensive codebook was developed to maintain consistency and clarity throughout the process, containing descriptive code names, clear definitions, illustrative examples from the data, and exclusion criteria to minimize overlap and ambiguity. The analysis was carried out by a team of three researchers, each with expertise in qualitative research, education, and AI adoption in higher education. The researchers collaborated closely to ensure alignment in coding practices, regularly reviewing the codebook and resolving differences in interpretation through consensus-building discussions. This multi-researcher approach has been reported to enhance the credibility and rigor of the analysis, ensuring diverse perspectives informed the interpretation of the data [22].

3.3.3. Theme Development

After coding the data, the researchers moved on to theme development, where related codes were grouped together to form broader themes that represented significant patterns in the lecturers' responses. Themes were identified by looking for common threads across the data, reflecting the major aspects of lecturers' experiences with AI tools like ChatGPT. For instance, responses related to the usefulness of AI in automating certain teaching tasks were grouped under the theme of "embracing technology", while concerns about the replacement of human interaction in the classroom led to the development of a theme called "skeptical responses". Similarly, discussions around the impact of AI on academic integrity and privacy concerns were categorized under the theme of "ethical and pedagogical concerns".

This phase was iterative, with the researchers continually refining the themes. Such iterations have been shown to provide comprehensive themes from qualitative data [23]. Codes were combined or split as necessary to ensure that the themes were meaningful and accurately reflected the lecturers' experiences. Each theme was supported by a set of codes that helped to capture the specific ideas underlying the broader theme.

3.3.4. Reviewing Themes

Once the themes had been developed, the researchers conducted a review of the themes to ensure they accurately represented the data and were coherent across all interview transcripts. This review process involved revisiting the themes to check their relevance to the research questions and the consistency of their representation across different participants. Three researchers checked whether each theme remained consistent across

the interviews and whether it was supported by strong evidence from the data. This step involved revisiting the coded segments and ensuring that they fit within the theme and contributed meaningfully to the overall narrative. Some themes were refined or merged based on this review, while others were split into smaller sub-themes to better capture the diversity of responses. Ultimately, the review process ensured that the themes were robust and reliable and accurately represented the lecturers' views on the use of AI in higher education. The final set of themes provided a clear framework for interpreting the data and addressing the research questions.

4. Findings and Discussion

Through thematic analysis, we categorized the lecturers' responses into five different themes: enthusiastic adoption, cautious optimism, skepticism, ethical and pedagogical concerns, and neutral observations. Enthusiastic lecturers see ChatGPT as a valuable resource for enhancing learning through personalized support and innovative integration. Those with cautious optimism recognize its benefits but emphasize the need for balance, pilot programs, and professional development. Skeptical lecturers raise concerns about accuracy and academic integrity, stressing the importance of critical evaluation and monitoring. Ethical and pedagogical concerns focus on student dependency, equity, and the need for clear usage guidelines. Lastly, neutral lecturers prefer to observe and gather evidence before fully integrating ChatGPT. The following sub-sections detail these varied perspectives and their implications for education.

4.1. Enthusiastic Adoption

Lecturers who embraced AI technologies reported that they recognized its potential to enhance the learning experience for students significantly. According to a study reported in [24], individuals with a positive mindset towards AI tools reported higher levels of satisfaction and perceived ease of use, suggesting that attitude plays a pivotal role in overcoming adoption resistance. In our interviews, enthusiastic lecturers noted the importance of ChatGPT in providing immediate feedback. This type of support is particularly beneficial for clarifying complex concepts and offering additional explanations that might not be fully covered during lectures. One lecturer stated, "ChatGPT has been incredibly useful in helping students understand difficult topics by providing instant and clear explanations. It's like having a teaching assistant available 24/7". Several lecturers highlighted the personalized support that "ChatGPT could offer as an important aid for student learning". They observed that "ChatGPT catered to individual student needs, allowing them to progress at their own pace". Other lecturers observed that "students can use the tool to seek help on specific issues without feeling embarrassed or overwhelmed". A lecturer from the Faculty of Engineering commented that "students appreciate the personalized attention they can get from ChatGPT". It adapts to their questions and provides tailored responses, which is something teachers cannot always do in a large classroom setting. These benefits were also reported in similar studies.

Furthermore, lecturers who were enthusiastic about technology explored innovative ways to integrate ChatGPT into their curriculum, using it to create interactive lessons, quizzes, and assignments that engaged students more effectively, such as generating multiple-choice questions for weekly quizzes, which helped reinforce the material covered in class. This was also observed in similar studies where lecturers were reported encouraging their students to use AI technologies for learning [25,26]. Another lecturer mentioned "incorporating ChatGPT into group projects, whereby students used it to brainstorm ideas and solve problems collaboratively". Another enthusiastic lecturer "embraces ChatGPT as a tool for answering student queries and generating Supplementary Materials such as lecture notes and summaries". One lecturer reported "utilizing ChatGPT to create detailed summaries of each lecture which is then shared with the students". It is evident that lecturers feel that integrating ChatGPT in the classroom can significantly improve the teaching and learning experience for both lecturers and students. They feel that the tool can enhance

the educational environment and provide students with opportunities to personalize their learning experiences.

4.2. Cautious Optimism

Lecturers who expressed cautious optimism about ChatGPT emphasized its role as a supplementary tool rather than a primary teaching method. These lecturers acknowledged the potential benefits of ChatGPT but underscored the importance of maintaining a balanced approach. One lecturer stated that ChatGPT can be a useful supplementary resource, but it is crucial that students do not become too reliant on it. They need to develop their critical-thinking and problem-solving skills independently. Another lecturer described using ChatGPT to provide additional practice problems for students to work on outside of class while still encouraging them to seek help from peers. Another lecturer mentioned assigning tasks that required students to critique the responses generated by ChatGPT, thereby fostering analytical skills.

This approach aligns with findings reported in [27], noting that cautious optimism among educators can drive meaningful integration of AI tools in classrooms without compromising traditional pedagogical values. This study revealed that educators leveraging ChatGPT as a supplementary resource observed improved engagement and independent problem-solving skills among students. Similarly, findings reported in [28,29] also highlighted that using AI tools like ChatGPT for targeted activities such as generating discussion prompts or supplemental practice materials supports active learning while avoiding over-reliance.

A common strategy among these lecturers was to implement pilot programs to test the effectiveness of ChatGPT in specific courses or modules. These small-scale trials allowed lecturers to evaluate the tool's impact on student learning outcomes and gather feedback from both students and faculty. One lecturer reported that "we started a pilot program in our introductory programming course to see how ChatGPT could support students with coding assignments. The initial results are promising, but we need more data before making any broader decisions".

According to findings reported in [30], pilot programs are critical for assessing the integration of AI tools in education. Their research demonstrated that lecturers who implemented structured trial phases reported more informed decisions about the use of technology in their teaching. Furthermore, the authors of [31] argued that pilot programs provide an evidence-based approach to adoption, allowing educators to align AI use with specific learning objectives and measure its effectiveness. Cautious lecturers also emphasized the importance of gathering feedback from students to inform future use of ChatGPT. They sought to understand how students interacted with the tool and whether it effectively addressed their learning needs. One lecturer reported, "we regularly survey our students to get their feedback on ChatGPT. This helps us make adjustments and ensure that we use the tool in ways that truly benefit their learning". It was evident that lecturers who are cautious about integrating ChatGPT into the classroom are also conscious of the potential risks and challenges associated with its use. This cautious methodology highlights a thoughtful approach to its integration in education. As a result of this cautious approach, these lecturers adopted a balanced approach to integrating ChatGPT into their teaching. They used the tool to complement traditional methods, ensuring that students still engaged in independent study and critical analysis.

4.3. Skeptical Responses

Lecturers who were skeptical about ChatGPT expressed significant concerns regarding the accuracy and reliability of the information provided by the tool. They were wary of potential misinformation and its impact on student learning. The efficacy of AI tools in education has also been scrutinized by other scholars [1,4]. In our interviews, one lecturer commented that "ChatGPT can be a useful resource, but its responses are not always accurate". There is a risk that students might take incorrect information at face value

without verifying it, which can be detrimental to their understanding of the subject matter. Another lecturer stated that "students must learn to question and verify the information they receive from ChatGPT". They need to learn critical-thinking skills so they can discern accurate information from errors. Another lecturer commented that "there is a risk that students might rely on ChatGPT to do their homework or even write their essays, which undermines the learning process and academic integrity. We need to find ways to monitor and prevent this misuse". These lecturers emphasized the importance of teaching students to critically evaluate the responses generated by ChatGPT. They stressed the need for students to cross-check information with reliable sources and to use ChatGPT as a starting point rather than a definitive answer. Furthermore, a major concern among skeptical lecturers was the potential for ChatGPT to be misused for academic dishonesty, such as cheating and plagiarism. They worried that students might use the tool to complete assignments without fully understanding the material. Moreover, to address these concerns, some lecturers advocated for stricter monitoring and control measures to ensure that ChatGPT was used ethically. They suggested using software that could detect AI-generated content and emphasized the importance of clear academic policies. A lecturer stated that "developing a robust system to detect when ChatGPT has been used inappropriately is a must". This includes using plagiarism detection tools that recognize AI-generated text and setting clear consequences for misuse. Some lecturers mentioned the need to embrace AI tools as valuable educational resources. For instance, incorporating ChatGPT as a supplementary tool rather than a replacement for traditional teaching methods can help maintain academic integrity while enhancing learning. Additionally, it is crucial to teach students how to use ChatGPT responsibly and effectively. This involves creating guidelines for ethical use, educating them on the importance of avoiding plagiarism, and providing clear instructions on how to reference ChatGPT in their academic work properly. By adopting these strategies, we can ensure that AI enhances rather than hinders the learning experience. Furthermore, sharing success stories and best practices from lecturers who have effectively integrated ChatGPT could inspire and guide others. Fostering a culture of openness and adaptability in education will better prepare educators and students to navigate the evolving landscape of educational technology.

4.4. Ethical and Pedagogical Concerns

Lecturers who expressed ethical and pedagogical concerns were particularly worried about students becoming overly dependent on ChatGPT, potentially hindering the development of essential academic skills. They stressed the importance of students learning to solve problems independently and critically think through issues without over-reliance on AI tools. Such concerns have also been reported in other findings [32].

In our study, one lecturer commented that "if students rely too heavily on ChatGPT, they might miss out on developing critical problem-solving skills that are crucial for their academic and professional growth". Some lecturers highlighted "the need to encourage independent learning among students". They believed that while ChatGPT could be useful, it should not replace traditional study methods and personal effort. A lecturer stated that "ChatGPT can be a great supplementary resource, but it shouldn't be a crutch". Students need to engage with the material themselves to truly understand and retain the knowledge. Furthermore, some lecturers advocated for a balanced use of ChatGPT to mitigate the risk of student dependency on the technology. They recommended integrating the tool in a way that complements rather than substitutes traditional learning approaches. For instance, one lecturer suggested "using ChatGPT to provide hints and supplementary explanations while ensuring that students still work through problems independently". Another lecturer mentioned that "we need to find a balance where ChatGPT enhances learning without becoming the primary method for solving assignments". Lastly, some lecturers advocated for inclusive education practices to ensure that the benefits of ChatGPT were accessible to all students. They suggested providing training and support to help students develop the skills needed to use AI tools effectively. A lecturer remarked that "we should offer

workshops and resources to help students understand how to use ChatGPT and similar technologies responsibly and effectively". This way, teachers can ensure that everyone benefits from these advancements. Another group found that ethical considerations were a significant focus, with lecturers emphasizing the importance of using ChatGPT responsibly. They highlighted the need for clear guidelines and policies to prevent misuse and ensure that students use the tool ethically. One lecturer stated that clear guidelines should be established on how ChatGPT should be used in academic settings. It is crucial that students understand the ethical implications and use the tool in a way that supports their learning rather than undermines it.

4.5. Neutral Stance

Lecturers adopting a neutral stance preferred to observe the impact of ChatGPT on education before forming strong opinions. These lecturers were cautious about making any definitive judgments or major changes to their teaching practices without concrete evidence of the tool's effectiveness. One lecturer explained that "I am open to the idea of using ChatGPT, but I want to see more data on how it impacts student learning before I fully integrate it into my courses". Some lecturers emphasized the importance of evidence-based decisions regarding the use of ChatGPT. They were interested in research and pilot studies that could provide insights into the benefits of the tool. A lecturer stated that "robust research is needed to understand the true impact of ChatGPT on education. I would like to see more studies and pilot programs that evaluate its effectiveness in different contexts". Lecturers in this group were keen on gathering feedback from students and colleagues to inform their decisions. They believed understanding how students interacted with ChatGPT and their experiences would be crucial in determining the tool's value. One lecturer mentioned that student feedback is essential; by listening to their experiences with ChatGPT, teachers can make informed adjustments and improvements to how they use the tool. Furthermore, lecturers favored an iterative approach, testing ChatGPT in small, controlled settings and refining its use based on outcomes and feedback. They were open to experimenting with the tool in a limited capacity and gradually expanding its use if the results were positive. A lecturer stated that "I am starting with a small pilot program in one of my classes. Depending on the results, we might expand its use to other courses".

Also, recognizing the need for effective implementation, these lecturers expressed interest in professional development opportunities to better understand ChatGPT's capabilities and limitations. They sought workshops, training sessions, and collaborative discussions with colleagues to explore the potential of AI in education. One lecturer stated that "I am interested in learning more about how to use ChatGPT effectively. Professional development and training would be very helpful in understanding the best practices".

It is evident that lecturers often adopt a neutral and observational stance towards the integration of ChatGPT in the classroom. They prioritize cautious observation and evidence-based decisions to ensure that any technological integration genuinely enhances student learning outcomes.

5. Discussion

This study investigated lecturers' perceptions of integrating artificial intelligence (AI) tools into teaching practices. The findings suggest that AI support and adoption can significantly contribute to infrastructure improvement, quality education enhancement, and fostering innovation. Lecturers highlighted that adopting AI is essential for advancing student skills and engagement. The results indicate that lecturers are generally open to integrating AI tools, although with varying degrees of interest.

Some lecturers who were enthusiastic about technology explored innovative ways to integrate ChatGPT into their curriculum using it to create interactive lessons, quizzes, and assignments that engaged students more effectively, such as generating multiple-choice questions for weekly quizzes, which helped reinforce the material covered in class. This was also observed in similar studies where lecturers were reported encouraging their students

to use AI technologies for learning [24–26]. The opinions of the lecturers who expressed cautious optimism about ChatGPT emphasized its role as a supplementary tool rather than a primary teaching method. This approach aligns with findings reported in [27], noting that cautious optimism among educators can drive meaningful integration of AI tools into classrooms without compromising traditional pedagogical values. Their study revealed that educators leveraging ChatGPT as a supplementary resource observed improved engagement and independent problem-solving skills among students. Similarly, findings reported in [28,29] also highlighted that using AI tools like ChatGPT for targeted activities such as generating discussion prompts or supplemental practice materials supports active learning while avoiding over-reliance. According to some lecturers, pilot programs should be implemented to test the effectiveness of ChatGPT in specific courses or modules. Based on the findings reported in [30], pilot programs are critical for assessing the integration of AI tools into education. Their research demonstrated that lecturers who implemented structured trial phases reported more informed decisions about the use of technology in their teaching. Furthermore, the authors of [31] argued that pilot programs provide an evidence-based approach to adoption, allowing educators to align AI use with specific learning objectives and measure its effectiveness.

Some lecturers were skeptical about ChatGPT and concerned about the accuracy and reliability of the information provided by the tool. Similar concerns have been reported in other studies [1,4]. Some lecturers are also concerned about ethical and pedagogical issues, particularly the risk of over-reliance on AI tools. Similar concerns have been reported in other studies [32–34]. Some lecturers have adopted a neutral and observational stance towards the integration of ChatGPT into the classroom. They prioritize cautious observation and evidence-based decisions to ensure that any technological integration genuinely enhances student learning outcomes. Similar observations have been made in fields such as medicine. The work in [27] recommended that AI adoption in medical education must be carried out with extreme caution.

While many lecturers view AI tools as a valuable resource for enhancing student learning and creativity, others express concerns about their implications for education. The positive perceptions included the belief that AI tools provide exciting opportunities for both students and educators to foster creativity, explore innovative ideas, and collaborate more effectively. However, some lecturers raised concerns about potential downsides, such as students' overreliance on AI tools, which might hinder critical thinking, creativity, and the learning process. Others lectures worried that AI tools such as ChatGPT might undermine the student–teacher relationship by reducing opportunities for meaningful dialogue and shared understanding, which are critical components of effective teaching practices.

6. Conclusions

This study examined lecturers' perceptions of integrating ChatGPT into higher education, revealing a range of attitudes from enthusiastic adoption to cautious optimism, skepticism, and neutrality. These varied perspectives highlight the multifaceted implications of AI integration in teaching and learning. While some lecturers acknowledged ChatGPT's potential to enhance student engagement and personalized learning, others expressed concerns about its limitations, ethical challenges, and risks of misuse. These findings emphasize the need for a balanced, evidence-based approach to incorporating AI in educational practices.

Lecturers who embraced ChatGPT emphasized its role in supplementing traditional teaching by providing immediate feedback, clarifying complex concepts, and supporting students with tailored resources. Innovative uses such as generating quizzes, brainstorming ideas, and creating supplementary materials showcase its potential to enrich the educational experience. However, skeptical lecturers highlighted significant concerns, including the accuracy of AI-generated content, the potential over-reliance of the students, and risks of academic dishonesty. Ethical challenges and equity issues were also noted, stressing the importance of responsible AI usage and ensuring equitable access to these technologies.

Neutral lecturers called for more robust research and evidence-based adoption to better understand the long-term implications of ChatGPT.

Lecturers perceived ChatGPT as a valuable tool for enhancing teaching efficiency, offering real-time feedback, and fostering student engagement. However, they also identified challenges such as the risk of academic dishonesty, inaccuracies in AI-generated content, and ethical concerns about data privacy and responsible use. They viewed ChatGPT as a supplemental tool capable of enhancing traditional teaching methods, with the potential to create dynamic learning experiences, but they stressed the need for clear guidelines and institutional support to address ethical, pedagogical, and technical challenges.

This study has several limitations. It was limited to lecturers at a single University of Technology in South Africa, which may restrict the generalizability of the findings. The study's sample size, while diverse, may not fully capture the breadth of perspectives across all higher education contexts. Additionally, the study primarily focused on ChatGPT as a case example of AI tools, potentially overlooking other AI applications that may be relevant to teaching and learning. The rapidly evolving nature of AI technology also means that perceptions and practices may change over time, necessitating ongoing research to capture these dynamics.

Future research should expand to include multiple institutions, both within South Africa and internationally, to better understand the broader implications of AI adoption in higher education. Comparative studies across disciplines could provide deeper insights into how subject-specific requirements influence the adoption of AI tools. Longitudinal studies are also necessary to assess the sustained impact of ChatGPT and other AI technologies on teaching and learning outcomes. Further exploration of students' perspectives on AI tools and their alignment with lecturers' perceptions would offer a holistic understanding of AI's role in education. Additionally, research should investigate the development of comprehensive training programs for lecturers, focusing on fostering critical thinking and ethical awareness in using AI.

To address the challenges and maximize ChatGPT's benefits, institutions should develop clear guidelines and policies for its ethical and responsible use. Professional development programs should train lecturers on effective integration practices, focusing on capabilities and limitations and fostering critical thinking. Pilot programs should test ChatGPT's efficacy in specific courses or modules, and efforts must ensure equitable access to AI tools, especially for underprivileged students. Continuous research and feedback mechanisms will be crucial in refining AI integration strategies and ensuring they meet the needs of the academic community. By addressing these challenges and building on these recommendations, higher education institutions can leverage AI tools like ChatGPT to transform teaching and learning while maintaining ethical and pedagogical integrity.

Author Contributions: Conceptualization, M.B.M., V.J. and K.O.A.; methodology, M.B.M. and V.J.; software, M.B.M. and V.J.; validation, M.B.M., V.J. and K.O.A.; formal analysis, M.B.M., V.J. and K.O.A.; investigation, M.B.M., V.J. and K.O.A.; resources, M.B.M. and V.J.; data curation, M.B.M. and V.J.; writing—original draft preparation, M.B.M., V.J. and K.O.A.; writing—review and editing, M.B.M., V.J. and K.O.A.; visualization, M.B.M., V.J. and K.O.A.; supervision, M.B.M.; project administration, M.B.M. and V.J.; funding acquisition, M.B.M. and V.J. All authors have read and agreed to the published version of the manuscript.

Funding: The APC was funded by the Research Directorate at Mangosuthu University of Technology.

Institutional Review Board Statement: The study was approved by the Ethics Committee of Mangosuthu University of Technology (Ethical Clearance Number: RD1/15/2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are not publicly available as they are protected under the ethics guidelines.

Conflicts of Interest: The authors declare no conflicts of interest.

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