# Section 2

# Generative AI in Higher Education: Revolutionising Teaching, Assessment, and Integrity

# Chapter 6

# Transforming Higher Education: The Profound Impact of Generative Artificial Intelligence on Teaching and Learning in the ChatGPT Era

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## Introduction

Educational practices in the 21st century have undergone a significant transformation due to technological advances, particularly in artificial intelligence (AI). Recent developments and expansion in machine learning led to the emergence of generative artificial intelligence (Gen-AI), an advanced and innovative technology (Hu 2022). Lim, Gunasekara, Pallant, Pallant, and Pechenkina (2023:2 of 13) define Gen-AI as a technology that 1) uses deep learning models to 2) generate human-like content (e.g., images and words) in response to 3) complex and varied prompts (e.g., languages, instructions, and questions). It can do so in response to a wide range of prompts that may be complex and diverse, including different languages, instructions, or questions. In other words, Gen-AI can produce human-like outputs when given various types of input.

ChatGPT (chat generative pre-trained transformer), an implementation of Gen-AI, developed and released by OpenAI in November 2022, uses publicly available digital content data to produce text in multiple languages that is very similar to human writing. OpenAI released ChatGPT 3.5 in November, followed by a more powerful and capable version to perform more complex

functions, ChatGPT 4, in March 2023. In January 2024, it had around 180 million users and is a rapidly growing and widely used platform (OpenAI 2024). Upon registration, both versions are readily available for use without any prior training required. While the first version is free, ChatGPT 4 currently costs $20 monthly (OpenAI 2024). The powerful language model, which is still an emerging innovation, has already shown that it can display creativity in its writing, from a single paragraph to a complete research paper, on almost any topic (Aydin & Karaarslan 2022:22). It has made educational resources more accessible and extended the reach of higher education beyond traditional classroom settings or local settings, creating new opportunities for both lecturers and students (Celik 2023:4).

The scalability and accessibility of Gen-AI enable a global reach in HE (higher education), breaking geographical barriers and making quality education available to students worldwide. These developments further represent a significant advancement in smart learning, enhancing the ability to offer personalised and engaging learning experiences (Pesovski, Santos, Henriques, & Trajkovik 2024:2). ChatGPT plays a pivotal role in enhancing the learning environment by tailoring responses to each student's unique needs and preferences, as highlighted in a recent study by Rawas (2023:2). Furthermore, the capabilities of ChatGPT, such as automated grading and feedback, ease the burden on educators, enabling them to focus on more valuable tasks, such as facilitating discussions, building social engagements, and providing specialised support that cannot be provided by Gen-AI (Conijn, Kahr, & Snijders 2023:41).

Despite the capabilities of ChatGPT (and similar technologies such as Google's Bard and Copilot by Microsoft), it should be considered along with the risks and challenges to ensure its ethical and responsible use in HE. For example, Adiguzel, Kaya, and Cansu (2023:1) mention ethical issues such as bias and the need to train educators to successfully incorporate Gen-AI tools as challenges in using ChatGPT. Additionally, Rawas (2023:2) adds that due to the significant amount of data ChatGPT uses, privacy and security issues are a top priority when using the tool. As ChatGPT is an AI-generated assistant

that facilitates communication between students and educators, it is important to ensure that its use does not have negative consequences. To achieve this, adequate monitoring by educators and accountability on the side of students are needed. This will ensure that all interactions are appropriate, respectful, ethical, and safe. Therefore, it is the responsibility of both students and educators to use Gen-AI tools such as ChatGPT with care and consideration to avoid any intentional and unintentional harm that may arise from using the tool. In doing so, the tool remains useful to all users.

The use of Gen-AI tools such as ChatGPT in HE has gained significant attention from universities worldwide as a disruptive tool for teaching and learning, as well as for supporting their staff and students (e.g., Conijn *et al*. 2023:39; Wong 2024:2). Similarly, IHEs (institution of higher education) have actively explored the potential of incorporating Gen-AI tools into their pedagogical approaches. The aim is to enhance the quality of education by offering personalised learning experiences that address the unique needs of each student (Rasul, Nair, Kalendra, Robin, De Oliveira Santini, Ladeira, Sun, Day, Rather, & Heathcote 2023:43). Such an approach recognises that Gen-AI technology has the potential to transform traditional teaching methods, making learning more interactive, engaging, and effective. With the help of Gen-AI tools such as ChatGPT, IHEs can create customised learning paths that are tailored to the individual needs, interests, and learning styles of each individual student.

By analysing student performance data and feedback, ChatGPT algorithms can identify strengths and areas that need more support. This will, in turn, provide them with targeted interventions to help them overcome their challenges. Such personalised learning approaches can help students stay motivated and engaged, which could lead to better outcomes. However, due to the recent emergence of Gen-AI tools, the academic community is still in the process of determining the most efficient and responsible ways to incorporate such tools into HE. Ongoing research in this area is needed.

This chapter offers insights into how Gen-AI tools like ChatGPT could revolutionise HE. From a theoretical and interpretative analysis based on an integrative literature review (Hambaloyi & Jordan 2016:121), recent articles (mostly published in 2023) are focusing on the transformative role of Gen-AI, with specific reference to how ChatGPT was analysed in HE. The following search string was used on Google Scholar to search for articles: Higher education AND generative AI OR ChatGPT AND opportunities AND transformation AND teaching AND learning. From the literature search, the limited investigation into the topic was confirmed, as noted by Rawas (2023:3). Most studies revolve around broader AI in education, education in general, or the use of specific tools. To further refine the search, articles focussing on these topics were excluded for the purpose of this chapter, although they might have had relevance. Based on the literature review, this chapter aims to investigate the unique opportunities and challenges that ChatGPT presents for transforming HE.

## Opportunities of ChatGPT in Higher Education

The emergence of Gen-AI tools is the key to progress innovation and can revolutionise HE. It can create exciting new opportunities for students, educators, and IHEs alike if they understand its possibilities and realities. With its cutting-edge technology and advanced natural language processing capabilities, ChatGPT can open previously unexplored avenues of teaching and learning.

Based on the literature reviewed (as indicated below), this section discusses some of the promising options that ChatGPT provides. The studies consulted meet the inclusion criteria and provide an insightful glimpse into how ChatGPT is changing, and could increasingly revolutionise teaching and learning in HE in the future. However, it is worth mentioning that these studies are not meant to be an exhaustive list of all research done in 2023 in this area. The table below shows the authors and their respective countries for the selected papers. Of importance is that, although the search string was limited to opportunities, the chosen articles also highlight challenges that come along with them to provide a balanced perspective. The opportunities and challenges identified in the articles are listed below, and a discussion follows.

**Table 6.1**: Authors of papers indicating opportunities and challenges identified in their papers

| Author(s) | Opportunities | Challenges |
|---|---|---|
| Rawas (2023)<br><br>(Lebanon) | Personalised learning.<br>Interactive learning.<br>Automated grading.<br>Intelligent tutoring.<br>Content creation.<br>Language learning.<br>Accessibility. | Bias.<br>Ethics.<br>Lack of human interaction.<br>Technical issues.<br>Cost and implementation. |
| Rasul *et al.* (2023)<br><br>(Australia, Brazil, India) | Adaptive learning.<br>Individualised feedback.<br>Research, writing, and data analytics support.<br>Administrative support.<br>Assessment support. | Ethics.<br>Equity considerations.<br>Academic integrity.<br>Potential bias.<br>False information.<br>Evaluation of graduate skill sets.<br>Assessment of learning outcomes. |
| Adiguzel *et al.* (2023)<br><br>(Turkey) | Language translation.<br>Text summarisation.<br>Question answering.<br>Creative writing.<br>Content creation.<br>Responses to prompts.<br>Explanation of complex subjects, concepts, or themes.<br>Error correction in existing code.<br>Generation of new codes. | Ethics.<br>Privacy.<br>System performance issues.<br>Inaccuracy of content.<br>Academic integrity. |
| Vargas-Murillo, De la Asuncion, and De Jesús Guevara-Soto (2023)<br><br>(Peru) | Enhancement of the teaching and learning process.<br>Generation of new ideas. | Overreliance on AI.<br>Ethics.<br>Inaccuracy of content.<br>Loss of ability to produce original content.<br>Academic integrity.<br>Loss of critical thinking skills.<br>Academic dishonesty.<br>Cheating in exams. |

| Author(s) | Opportunities | Challenges |
|---|---|---|
| Mhlanga (2023)<br><br>(South Africa) | Personalised learning.<br>Provision of educational materials.<br>Widening participation.<br>Language support.<br>Improved efficiency.<br>Cost-effectiveness.<br>Assessment support. | Bias.<br>Lack of empathy.<br>Lack of creativity.<br>Overreliance on AI.<br>Limited domain knowledge.<br>Connectivity. |
| Gill, Patros, Wu, Kaur, Kaur, Fuller, Singh, Arora, Parlikad, and Stankovski (2024)<br><br>(UK, China, New Zealand, Canada, USA, India, Slovenia, Australia, Austria) | Personalised support.<br>Language assistance.<br>Customised learning.<br>Active learning/flipped learning.<br>Participatory learning. | Inaccuracy of content.<br>Plagiarism.<br>Bias.<br>Ethics. |

Lastly, in addition to the work of the above researchers, the following question was asked to ChatGPT 4: *Considering its opportunities and challenges, how could ChatGPT transform teaching and learning in higher education?* The response included the opportunities and challenges indicated in Table 6.2.

**Table 6.2**: Opportunities and challenges identified by ChatGPT

| ChatGPT | Opportunities | Challenges |
|---|---|---|
| ChatGPT (OpenAI 2024) | Personalised learning.<br>Accessibility.<br>Inclusivity.<br>Research and writing.<br>Supplemental teaching tool.<br>Interactive learning environments. | Academic integrity.<br>Quality assurance.<br>Ethics and privacy.<br>Teacher and student adaptation.<br>Overreliance on AI. |

Based on the concepts provided in Tables 6.1 and 6.2, ChatGPT created the following word cloud on the opportunities of ChatGPT. It indicated that it used the Python application to create it. The word cloud visually represents the key terms and concepts, with more frequent terms appearing larger in the cloud. It provides a

quick and insightful view of the main themes and opportunities associated with ChatGPT.


**Figure 6.1**: Word cloud of the opportunities of ChatGPT in Higher Education. (Source: OpenAI 2024)

Similar to the opportunities, ChatGPT was asked to create a word cloud for the challenges listed in the table.

The purpose of the word clouds was to extract and visualise key information from the table presenting ChatGPT's benefits and challenges in transforming HE. The most prominent or recurring concepts are clearly visible as they appear in the larger text. The word clouds also helped to identify the most important aspects of the opportunities in the following discussion.


**Figure 6.2**: Word cloud of the challenges of ChatGPT in Higher Education. (Source: OpenAI 2024)

## Discussion of Opportunities and Challenges in Transforming Higher Education

*Opportunities*

Through the analysis of opportunities presented by ChatGPT in transforming HE as they occurred and were discussed in the articles, several insightful perspectives emerged. These perspectives offer a deeper understanding of how ChatGPT can be used to enhance teaching and learning in HE. One recurring theme that emerged was the opportunity for personalised learning and support, which was often mentioned as its most valuable advantage (cf. Gill *et al.* 2024:20). Personalised learning and support refer to an approach that tailors learning experiences to the unique needs of individual students through unique responses and resources (Yang, Hwang, & Yang 2013:185). According to Chiu, Moorehouse, Chai, and Ismailov (2023:11), such a personalised, often step-by-step approach to teaching and learning, including

timely feedback, encourages self-directed learning and self-reflection through identifying and learning students' behaviour and errors. This customisation makes the learning experience more relevant and engaging, encouraging students to take control of their learning journey. For example, it can allow students to spend more time on challenging tasks and quickly skim through materials and content that they already understand, fostering a sense of autonomy in learning. It can further stimulate curiosity by providing materials that align with the interests of a student.

ChatGPT can analyse students' learning styles, preferences, and requirements to offer customised feedback and content, leading to more effective and engaging learning experiences (Rawas 2023:5; OpenAI 2024). As such, Vargas-Murillo *et al.* (2023:123) refer to ChatGPT as an auxiliary tool to help students complete certain tasks based on their unique preferences. This personal content and feedback are possible because computer algorithms and AI use the interaction of a student with previous content to determine future materials and trends (Kerr 2016:89). An important aspect of these algorithms highlighted by Mhlanga (2023:6) is that ChatGPT can use them according to the specific requirements and preferences of each student. Because Gen-AI tools learn from vast amounts of text data, they can predict the most appropriate responses. This learning capability of ChatGPT makes it possible to adapt its responses based on the input of the user, making the learning experience more personalised (OpenAI 2024).

Personalised and adaptive learning can enhance student engagement and motivation (Rasul *et al.* 2023:44; Mhlanga 2023:3). Educators and students can access ChatGPT for on-demand feedback and content, depending on their needs. ChatGPT is human-like and conversational; therefore, students are more likely to feel engaged and valued. This ability to offer interactive learning experiences has many advantages, as ChatGPT promptly responds to questions and allows for follow-up conversations and question-and-answer opportunities (Rawas 2023:5; OpenAI 2024). Active participation in the learning process can positively impact the learning experience and improve the overall quality of education. ChatGPT can help in many ways in this regard, as it

uses normal language to generate ideas for research, assessments, and writing tasks. Using ChatGPT, educators can also gain valuable insight into student engagement with course content and identify areas for improvement. This can help the educators to adapt their teaching approaches and improve the learning outcomes of their students. Therefore, ChatGPT's ability to offer low-cost, automated support can transform HE, as it can offer high-level, personalised, on-demand support to both educators and students.

Related to personalised learning is the opportunity offered by ChatGPT for individualised feedback to both students and educators. Based on the student's prompts, ChatGPT can provide individualised feedback, making learning a more rewarding experience. Additionally, ChatGPT has the potential to detect errors and guide students in how to improve their learning (Rasul *et al*. 2023:45). Rather than relying on traditional one-size-fits-all feedback approaches, students can build their own understanding of concepts and content. However, it is important for both students and educators to know that ChatGPT can provide incorrect information and that its accuracy greatly depends on accurate prompts (Rudolph, Tan, & Tan 2023:352). It is also true that accurate prompts can produce inaccurate responses. Therefore, relying on ChatGPT without acknowledging its limitations can lead to the dissemination of incorrect or misleading information, which negatively affects academic integrity. The implication is that in the era of Gen-AI, humans, in this case, educators and students, are still essential to check the accuracy of the information generated by tools such as ChatGPT. Individualised feedback can further reduce costs, as the use of human tutors could be reduced to provide student feedback (Rasul *et al*. 2023:45).

However, as Rawas (2023:5) argues, ChatGPT can contribute to personalised learning by acting as a valuable personal tutor for students. This is especially applicable in courses with large numbers of students. As a personal tutor, it can perform a range of tasks, such as answering complex questions, helping students to practise conversations, summarising key concepts, and preparing them for assessments by offering practice questions. In addition,

it can provide motivational support by being always available. This is specifically relevant to those who, for different reasons, cannot attend the class. However, Gen-AI tools such as ChatGPT should be used as partners for humans and not as replacements, since checks for accuracy, correctness, relevance, and ethical use are necessary.

LLMs (large language models) such as ChatGPT can assist both educators and students in initiating ideas or completing writing and research tasks by providing ideas and support (Rasul *et al*. 2023:45; Vargas-Murillo *et al*. 2023:132; OpenAI 2024). ChatGPT can be an efficient assistant by providing basic information on any topic of interest. It can also assist in conducting initial literature reviews by summarising research articles and generating draft versions of research articles, providing a solid foundation to build on (Rudolph *et al*. 2023:342). This implies that ChatGPT can act as a partner or research assistant in research activities. However, as Rasul *et al*. (2023:45) caution, this should be done ethically, while academic integrity should not be compromised. Writing support is a valuable resource for students and educators who work in a language different from their home language (Rudolph *et al*. 2023:343). However, this should be approached with caution, as ChatGPT can provide incorrect information and fabricate references (Sok & Heng 2024).

Rasul *et al*. (2023:46) mention automated administrative support as a benefit offered by ChatGPT as a possible way of teaching and learning support to transform HE. This aspect is relevant to this chapter because such support can help students in satisfaction and success: 'ChatGPT can help students overcome administrative challenges while also providing them with precise and timely information' (Rasul *et al*. 2023:46). This support is extremely valuable in distance education contexts where students are not necessarily on campus and may easily find themselves lost and isolated. They may have to travel without this kind of assistance to get the needed support. If ChatGPT is integrated with an institution's learning management system, it can take ownership of administrative tasks by providing customised information on teaching and learning issues, such as issues with upcoming due dates, incomplete tasks, and progress reports.

According to Lo, Hew, and Jong (2024:2 of 21), AI technologies can assist in administrative tasks by detecting student disengagement. These tasks can alleviate educators' administrative burdens and contribute to a more effective and successful teaching and learning experience for both educators and students.

As another advantage, ChatGPT can be integrated into innovative assessment activities to promote a student-centred environment. Innovative assessment contributes to a more comprehensive and meaningful evaluation of student learning, as stated in the study conducted by Rasul *et al.* (2023:46). For instance, ChatGPT can be used to create various types of questions, such as multiple choice, short answer, and case studies, and can be used to evaluate the assessments created by ChatGPT. Mhlanga (2023:8) adds that ChatGPT has the ability to understand the larger context of the assignment, assess students' work, and provide personalised feedback. It can analyse the content, structure, and style of the assessment, pointing out suggestions for improvement and helping students understand their specific strengths and weaknesses. This approach can help to develop the critical thinking skills of educators and students and encourage them to engage with ChatGPT.

The use of ChatGPT in assessments requires innovation, creativity, and authenticity in the assessment setting. This involves moving away from traditional assessments that often rely on the memorisation of content. The integration of ChatGPT can promote collaboration and problem-solving skills. Students can, for example, use ChatGPT to brainstorm ideas, clarify concepts, and seek guidance, which could foster teamwork and collaboration. However, designing such innovative assessment tasks requires skilled educators. Related to the setting of assessments is the ability of ChatGPT to assist with automated grading. Grading assignments, tests, and examinations can be automated, offering educators more time for teaching-related tasks. Automated grading further provides faster feedback and minimises biases in grading (Rawas 2023:5).

ChatGPT has gained a reputation for creating high-level educational content such as lecture notes, summaries,

and explanations (Rawas 2023:6). Educators can partner with ChatGPT to generate comprehensive lecture notes that are interactive and engaging. With its vast knowledge base and natural language processing capabilities, ChatGPT can create explanations, summaries, or examples if needed, making it easier for educators to create interactive and comprehensive learning materials. Mhlanga (2023:5) adds that ChatGPT can help educators to provide high-quality educational resources and insightful information. These capabilities would improve the effectiveness of teaching and learning by providing much-needed resources that may not otherwise be available.

In addition to its collaboration with educators, students can benefit from the ability of ChatGPT to create content. They can use it to find relevant sources and summarise research papers, which can save them time and effort. The language model can further help students with tasks such as outlining, structuring, and developing arguments for essays. These tasks are crucial for academic success, and the language model can provide valuable guidance, making the writing process more manageable and effective. However, these processes must be ethical and transparent, and the use of chatbots in such writing processes must be acknowledged by students.

As a language model, ChatGPT can help students with language-related tasks. For example, it can help students learn a language by offering conversation partners and language models (Rawas 2023:6). It can stimulate conversations in the target language, helping students to practise speaking and comprehension. Students can learn new words and phrases through interaction with ChatGPT, which can, in turn, provide examples of how these words are used in context, thus assisting with comprehension. It can further assist students in correcting their sentences, practising their pronunciation, grasping sentence structure, and giving accurate text interpretations (Gill *et al.* 2024:20). It additionally helps students by explaining grammatical rules in a user-friendly way. When students ask a specific question about grammar they will receive a detailed explanation. This means that students and educators can produce basic texts and ask ChatGPT to transform and correct them in the

desired style or format. Because ChatGPT has been trained in a variety of languages, it is possible for students who may struggle with concepts in the language of teaching and learning to still benefit from the educational experience (Mhlanga 2023:7). These recent developments have enabled language support to students, making higher education possible for all students, regardless of their backgrounds or the language they speak. This means that ChatGPT can give a translation and explanation of the language on demand. The tool can also assist with language-related tasks such as text summarisation, interpretation, and creative writing, like poems or fiction (Hutson & Schnellmann 2023:3).

The last possibility discussed in this section is that ChatGPT can expand access to quality education for all students, regardless of location, time of day, or personal circumstances. For example, Mhlanga (2023:2), referring to emerging markets, shares that ChatGPT can address challenges such as students living in deep rural areas with limited resources, including a shortage of educators and limited access to quality education.

Furthermore, access to personalised information due to Gen-AI tools makes it easier for students with disabilities who otherwise would not have access. Although ChatGPT is largely a text-based model, it can work alongside tools such as screen readers for visually impaired students or simplified explanations for students with cognitive disabilities. By providing everyone with access to quality education, ChatGPT can help to bridge educational gaps and create a more inclusive learning environment for all students.

*Challenges*

The integration of Gen-AI tools in the field of HE has the potential to bring about significant transformation. This transformation can manifest itself in many ways and can lead to numerous benefits for both educators and students in HE. However, despite the many benefits, several challenges have been discussed in the reviewed literature and are discussed next.

According to Rawas (2023:7), one of the biggest challenges facing ChatGPT is related to ethical issues such as bias. This

is because it may display partiality towards certain groups depending on the data on which it has been trained. For example, if a LLM is only trained on specific data sets, it could reinforce misunderstandings and result in students constructing inaccurate information and perceptions (Adiguzel *et al.* 2023:6). Therefore, it is crucial to ensure that the training data used are diverse and representative to avoid such challenges. It is important to note that ChatGPT, as an AI-powered assistant, may lack the cultural sensitivity and nuances needed that exist in certain countries and languages. Therefore, it could provide responses that are not culturally suitable, especially in countries with different cultures or where this is a sensitive matter (Mhlanga 2023:10).

Students may not always be able to evaluate the information they receive from ChatGPT, which may lead to a lack of development of needed knowledge and skills and even the wholistic growth of students. Furthermore, Mhlanga (2023:9) points out that those who develop technologies such as ChatGPT may deploy them to support their own biases, consciously or not, which may harm students' learning and growth. For this reason, humans need to be aware of this and partner with technology to ensure that Gen-AI tools are used as intended and do not disadvantage anyone.

Another ethical issue is related to privacy and security, which have been noted as key challenges of ChatGPT (Rawas 2023:8; Adiguzel *et al.* 2023:6). Because ChatGPT generates text on the input it receives, there is a risk that these data could be exposed or misused, especially if proper data handling and privacy protocols are not in place. Additionally, student and educator data must be protected by secure systems, as ChatGPT has access to large amounts of data. In this regard, Chan (2023:14) suggests that IHEs must have policies in place to protect their content.

Additional ethical issues are transparency and accountability. Users' online information is often used to train and improve Gen-AI models such as ChatGPT. Concerns arise about how these data are stored, who can access them, and for what purposes they are used, especially if they contain personal or sensitive information. Many users, including educators and

students, provide this kind of data, assuming that it is treated as confidential. Therefore, Rawas (2023:8) emphasises that institutions must be transparent and honest about using ChatGPT (and other Gen-AI tools) and hold themselves accountable for any decisions based on Gen-AI suggestions. Students should also give their consent after being informed how ChatGPT is used and how their data are handled, keeping in mind the data protection laws in different countries (such as the Protection of Personal Information Act in South Africa and the General Data Protection Regulation in the European Union). Ensuring compliance with such laws can be challenging given the global nature of the internet and the diverse user base of ChatGPT.

From an ethical perspective, the pedagogical impact of ChatGPT is another challenge that needs to be considered. The use of ChatGPT must be in line with educational objectives and principles and should not negatively affect the role of educators (Rawas 2023:10). For example, using ChatGPT as the only means of assessing student learning outcomes may impede social interaction and the ability to construct meaning through reflection, collaboration, and human interaction, as pointed out by Rasul *et al.* (2023:49). Therefore, a combination of human intelligence and AI may be the optimal solution to address this challenge.

One of the major hurdles that ChatGPT has to overcome is its lack of human interaction and empathy. While ChatGPT has the ability to offer personalised learning and feedback and acts human-like, it cannot replace collaboration and social interaction with humans and is unable to show empathy toward students or educators (Rawas 2023:7; Mhlanga 2023:9). If students are mostly relying on ChatGPT for their academic needs, they might miss out on emotional support, the opportunity for collaboration, socialisation, and discussions that are crucial for their overall development (Rasul *et al.* 2023:48). This might be stressful for students who have difficulty understanding certain concepts or even entire subjects. It might lead to isolation, a lack of motivation, and lead to further overreliance on technology. While ChatGPT can provide valuable information, it cannot establish a relationship between students and educators or among students

(Mhlanga 2023:9). These relationships motivate and inspire students to study and perform at their best.

The increasing use of Gen-AI tools in HE raises concerns about the potential impact on student learning and development. For example, Rasul *et al*. (2023:47) and Vargas-Murillo (2023:124) argue that students may rely more on feedback from ChatGPT at the expense of their educators due to an overreliance on technology. This could be due to the human-like nature of ChatGPT and its ability to facilitate communication, which can make students feel more comfortable and confident in their interactions with the tool. However, an overreliance on AI tools could lead to a decrease in the development of critical thinking and problem-solving skills. This is because students may be more likely to accept the feedback provided by ChatGPT without questioning it or engaging in deep analysis to ensure correct and reliable feedback and information (Tiwari, Bhat, Khan, Subramaniam, & Khan 2024:348). As a result, educators should work in conjunction with AI tools to ensure that students receive accurate and reliable feedback and information while also encouraging them to develop critical thinking and problem-solving skills. Relying too much on ChatGPT can have adverse effects on the growth of graduate skills, such as critical thinking, problem solving, collaboration, global and cultural awareness, and leadership. This means that using ChatGPT requires a balanced approach that upholds academic integrity and freedom while promoting graduate skill development (Rasul et al. 2023:49). In this regard, Vargas-Murillo et al. (2023:123) suggest that students should be ethical in deciding whether they want to use ChatGPT to complement their learning, as well as how much input the tool should be allowed to influence their work and skills development. In this way, exploitation is avoided, and they can learn how to use the tool effectively and avoid abusing it. Additionally, by using Gen-AI tools as a supplement to, rather than a replacement for, traditional teaching methods, educators can help students to receive a well-rounded education that prepares them for the world of work.

One of the significant challenges of integrating ChatGPT into the HE sector is maintaining academic integrity. This concern

arises mainly from the possibility that students may cheat during exams or use ChatGPT to generate essays, research papers, or assignments that should be their own writing. They can also engage in plagiarism by copying and pasting information from ChatGPT without properly referencing it, negatively impacting their learning and resulting in academic integrity violations (Vargas-Murillo *et al.* 2023:131; Mhlanga 2023:2). Related to plagiarism is the issue of intellectual property. If students submit Gen-AI content, the question arises: Whose content is this? Does the student, ChatGPT, or the institution to which the work has been submitted own the content?

The issue of plagiarism detection has become increasingly challenging for educators, also because accessing content and answers on ChatGPT is quick and very easy. Furthermore, Gen-AI produces content that is not easily distinguishable from text written by humans. This poses a significant challenge, as the technology to detect AI-generated texts is not always accurate (Raschka 2023; Mhlanga 2023:2; Gill *et al.* 2024:20). Even if students are allowed to use Gen-AI tools in their assessments, they will have an unfair advantage over those who are not using it. This raises issues of fairness because it undermines the integrity of the assessment process. Therefore, a culture of academic integrity and ethical use of ChatGPT should be emphasised (Sullivan, Kelly, & McLaughlan 2023:34). When students are made aware of the importance of authentic learning, they will have a better understanding of the importance of using their own ideas and building their own arguments.

Technical problems and connectivity are recorded as another challenge (Rawas 2023:7; Mhlanga 2023:7), as issues such as system failures and challenges related to internet access negatively affect access to technology and Gen-AI tools. Vogels (2021) refers to digital inequity, which occurs when access to high-speed internet and technologies is not evenly distributed, which could widen the digital divide. The disparity in access becomes evident when some students have access to advanced tools such as ChatGPT for learning and research while others do not. When students lack access to the knowledge provided by Gen-AI tools such as ChatGPT, the knowledge gap is further

widened. This gap can result in unequal learning opportunities and outcomes, contributing to increased educational inequalities. It is essential to recognise that Gen-AI tools should be available to everyone, regardless of their background or circumstances. In order to bridge the gap of inequalities, IHEs must make efforts to provide access to digital tools to all their students. This will help to ensure that everyone has the opportunity to benefit from the advancements of technology and contribute to a more inclusive and diverse digital community (Lim *et al.* 2023:8 of 13; Gill *et al.* 2024:21). This is particularly relevant for developing areas where many students face difficulties in accessing electricity and the internet.

The last challenge identified in this chapter is the ability of Gen-AI tools to produce false or inaccurate information. This could include providing, for example, incorrect facts, summaries of literature reviews, or references, which can be misleading to students instead of assisting them. To overcome this challenge, Rasul *et al.* (2023:49) suggest that students and educators should be aware of these inaccuracies to produce accurate information. Vargas-Murillo *et al.* (2023:131) also warn against the so-called 'hallucination effect,' in which AI tools generate information or responses that are factually incorrect or not related to the prompt it received. This is because ChatGPT can only present data on which it has been trained and does not have access to real-time data. For this reason, it may sometimes provide outdated information (OpenAI 2024). Furthermore, it may misunderstand a prompt, leading to irrelevant responses, specifically with complex, ambiguous, or poorly structured prompts or questions (OpenAI 2024). This challenge should remind both educators and students of the need for human verification to evaluate the information and verify its accuracy and correctness. This is definitely important in educational and academic contexts where accurate information is crucial.

*Implications*

From the literature review, it is clear that HE is going through a transformation process, which presents both opportunities and challenges. The findings expose a complex landscape with

numerous significant implications for policy, theory, and practice. The most important implications of this research are stated below.

**Transforming pedagogical practices**

Gen-AI tools such as ChatGPT necessitate the rethinking of teaching, learning, and assessment approaches. They should include guidance, mentoring, knowledge application, and reflection rather than teaching content. Such approaches should aim to foster critical thinking and problem-solving skills**.** Gen-AI tools diminish the importance of previous teaching and learning strategies, and both educators and students will need to be taught how to use the indicated technologies effectively and ethically. Institutions should carefully plan how to include Gen-AI into their current systems, such as learning management systems, student systems, and related operational systems. This also implies that training is needed on how to use these technologies.

**Combining human and Gen-AI strengths**

The use of ChatGPT in HE requires a balanced approach. AI should be used for efficiency, while human elements should be retained for empathy, creativity, critical thinking, and QA (quality assurance). Combining the roles of humans and AI can lead to an interactive relationship in which each complements the capabilities of the other. This chapter demonstrates how Gen-AI and humans can collaborate to produce text.

**Developing ethical and privacy frameworks**

To ensure that the use of Gen-AI tools in IHEs is ethical, unbiased, and respects privacy, robust frameworks and policies need to be developed and implemented to address ethical, biased, and privacy concerns regarding AI use.

**Providing AI literacy training**

IHEs should provide adequate training opportunities to educators and students to enable them to critically assess information and use AI efficiently and ethically. This will ensure that everybody is able to take advantage of the opportunities that Gen-AI tools offer and avoid ethical dilemmas that might arise from their use.

### Bridging digital divides

In the digital age, bridging the gap between those with access to Gen-AI tools and those without it is crucial. Efforts are therefore needed to ensure equitable access to Gen-AI tools to ensure that no institution, educators, or student is left behind.

### Preparing for future educational needs

Integrating Gen-AI tools such as ChatGPT hints at future developments and skills development needs, emphasising agility and lifelong learning. IHEs must therefore equip academics and students with the necessary knowledge and skills to navigate an increasingly technology-driven environment. This is of utmost importance for IHEs in preparing students for the modern workforce.

The implications for HE, based on the opportunities and challenges identified in this research, can be summarised as follows:

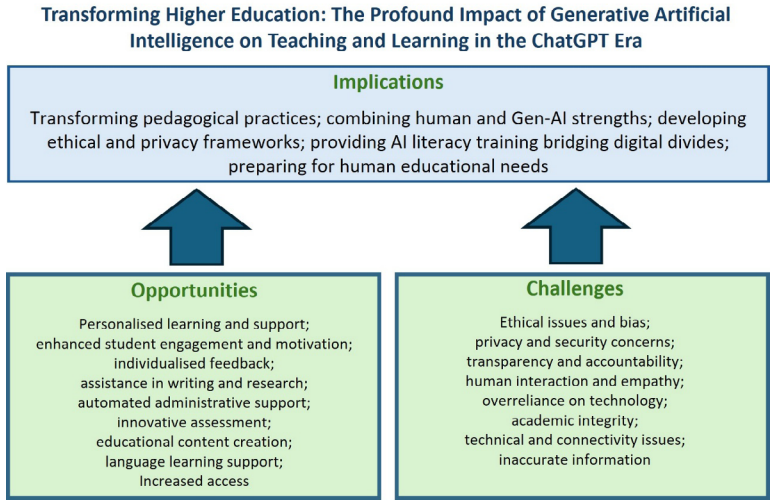


**Figure 6.3**: The implications of using generative artificial tools to transform Higher Education. (Source: Personal archive)

## Conclusion

This chapter aimed to offer insights into how Gen-AI tools such as ChatGPT could transform HE. It used an integrative literature review and focused on opportunities and challenges. The findings revealed that the transformative potential of ChatGPT in HE is significant and will continue to play a crucial role in shaping HE. From the literature review, several opportunities were discussed, namely personalised learning and support, improved student engagement and motivation, individualised feedback, assistance with writing and research, automated administrative support, innovative evaluation, educational content creation, language learning support, and expansion of access. With these opportunities, various challenges were also identified. These are ethical issues and bias, privacy and security concerns, transparency and accountability, a lack of human interaction and empathy, an overreliance on technology, academic integrity, technical and connectivity issues, and inaccurate information.

AI tools such as ChatGPT have already begun transforming HE and will increasingly change how educators teach and students learn. However, it is only the beginning, and several areas still need to be addressed. As AI tools will only get better and more human-like, HE will have to be adapted. Although ChatGPT has the potential to improve teaching and learning for everyone, the key is finding a balance and using this tool to enhance, rather than replace traditional educational practices. Collaboration among educators, researchers, policymakers, and students is essential to ensure that AI is used ethically and responsibly in education. The goal is to create a more equitable and effective education system that provides students with personalised teaching, feedback, and support by addressing the challenges posed by AI technologies and leveraging their benefits.

Every study has limitations, and this study is no exception. The main limitations are related to the number of articles reviewed and the methodology used. However, the findings of research papers from different countries around the world provided meaningful insights into the topic that can assist educators, students, and IHEs in a better understanding of Gen-AI in HE.

Lastly, ChatGPT and similar technologies will have an increasing impact on HE in the future. Therefore, further empirical research is needed to determine the potential benefits of these emerging technologies and how they can be used to the benefit of all.

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