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Artificial Intelligence: An Empirical Survey of Student and Staff Perspectives

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Abstract: There has been a recent upsurge in debates about the role and potential of artificial intelligence (AI) in transforming traditional learning environments globally, and more recently, these discussions have expanded to include developing countries. While proponents of AI praise it as a new normal that educators must embrace or risk falling behind, sceptics caution that AI poses significant risks to academic endeavours, often citing ethical dilemmas and widely reported misuse of these technologies. This study employed an explanatory sequential mixed methods design to explore student and staff perspectives on AI in teaching and learning. Data were collected from 375 students and 187 staff via a quantitative questionnaire, as well as from 30 students and 18 staff through follow-up semi-structured interviews. The findings revealed that although students and staff largely agreed on AI's potential to transform university teaching, learning, and research, there were significant differences regarding feedback enhancement, personalisation of learning, critical thinking, and the efficiency and accuracy of data analysis in research. The study recommends that stakeholders engage in ongoing dialogue, research, and professional development to navigate the opportunities and challenges presented by AI in education.

Keywords: Artificial intelligence, teaching and learning, research, higher education, transformation.

1. Introduction

The emergence of Artificial Intelligence (AI) has triggered revolutionary developments in several industries, including higher education institutions. In the ever-changing field of education, incorporating AI technologies presents both opportunities and challenges that require thorough analysis. The use of AI in higher education encompasses a broad spectrum of capabilities, ranging from personalised learning experiences to enhanced administrative efficiency, thereby transforming conventional models of teaching, learning, and institutional administration (George & Wooden, 2023; Katsamakas et al., 2024). In recent years, the widespread adoption of digital technologies has radically changed how knowledge is distributed and acquired. Traditional educational models are increasingly being complemented or even replaced by cutting-edge AI-powered solutions that specifically address the diverse needs of students (Shakina et al., 2021; Tan et al., 2021). Consequently, the rapid growth of AI technologies and applications has significantly altered the delivery and consumption of instructional information. Thus, Chen et al. (2020), Dumitru (2024), and Gligorea et al. (2023) argue that the capabilities of AI are extensive and diverse, ranging from intelligent tutoring systems that provide individualised learning experiences to data analytics platforms that enhance institutional decision-making. Advocates of AI in education contend that these technologies can enable personalised learning trajectories, catering to varied learning styles. This individualised approach is especially significant in higher education, where students often exhibit diverse backgrounds, abilities, and aspirations (Arsovic & Stefanovic, 2020).

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Within the context of higher education institutions (HEIs), the incorporation of AI has sparked a dynamic and complex discourse among educators, policymakers, and technologists. This debate centres on the potential of AI to revolutionise educational methodologies, improve learning outcomes, and transform institutional frameworks (Alam, 2021; Kuleto et al., 2021; Ouyang & Jiao, 2021). As the global educational landscape evolves, it is essential to critically assess the implications of utilising AI in higher education, considering its revolutionary potential alongside the ethical, pedagogical, and operational issues it raises (Kuleto et al., 2021; Ocaña-Fernández et al., 2019).

However, the discourse regarding AI in higher education is not without its detractors. Concerns about data privacy, algorithmic bias, and the dehumanisation of the educational experience have emerged as significant sources of controversy (Oviatt, 2021; Yu, 2020). Thus, reliance on AI systems prompts investigations into the ethical ramifications of data collection and use, particularly given the sensitive nature of student information (Dwivedi et al., 2021; Shneiderman, 2020). Consequently, the pedagogical implications of AI on teaching and learning processes, along with ethical considerations, require thorough scrutiny (Dwivedi et al., 2021). Therefore, while AI has emerged as a transformative force across various sectors (Girasa, 2020; Sedkaoui & Benaichouba, 2024), reshaping the landscape of technology and human interaction, integrating AI tools in HEI classrooms necessitates a reassessment of conventional teaching paradigms and the role of educators. Hence, there is a need to examine promising areas for AI-driven innovation in teaching, learning, and research within higher education institutions.

1. 1. Artificial Intelligence and its revolutionary influence across sectors

Artificial Intelligence (AI) has become a revolutionary influence across multiple sectors, altering the dynamics of technology and human connection. The term “artificial intelligence” encompasses a variety of concepts, approaches, and applications, necessitating a clear definition of its scope for this study. The concept of artificial intelligence originated in the mid-20th century, with foundational contributions from researchers like Alan Turing, who suggested the possibility of machines emulating human intelligence (Micchelucci, 2024; Turing, 1950). Turing's key study proposed the "Turing Test," a standard for assessing whether a machine demonstrates intelligent behaviour indistinguishable from that of a person (Micchelucci, 2024). This initial model laid the groundwork for future study and development in AI, impacting multiple fields including computer science, cognitive psychology, and philosophy (Micchelucci, 2024; Russell & Norvig, 2020; Sfetcu, 2024). AI can be classified into two principal categories: narrow AI and general AI. Narrow AI, or weak AI, focuses on specific tasks and operates within a restricted framework of limitations (Samoili et al., 2020; Thorn, 2015). Examples include facial recognition systems, natural language processing applications, and recommendation algorithms (Thorn, 2015). In contrast, general AI, or strong AI, aims to emulate the full range of human cognitive functions, allowing machines to perform any intellectual task achievable by a human. Although general AI remains predominantly theoretical, progress in narrow AI has generated considerable attention and investment across various industries (Goertzel & Pennachin, 2007; Samoili et al., 2020).

The evolution of AI technologies has been propelled by significant advancements, especially in machine learning (ML) and deep learning (DL) (Dimiduk et al., 2018; Soori et al., 2023). Machine learning, a branch of artificial intelligence, involves the creation of algorithms that enable computers to learn from data and improve their performance over time without explicit programming (El Naqa & Murphy, 2015; Jordan & Mitchell, 2015; Mahesh, 2020). Deep learning, a specialised subset of machine learning, employs artificial neural networks with multiple layers to analyse large datasets, facilitating advancements in image and speech recognition (Dargan et al., 2020; Hatcher & Yu, 2018). Technological breakthroughs have enabled the widespread use of AI applications across various sectors, including healthcare, banking, transportation, and entertainment.

While AI offers numerous advantages, its rapid progression has raised various ethical, social, and economic concerns. The risk of job displacement due to automation is a significant issue, as AI systems may take over roles historically performed by humans (Brynjolfsson & McAfee, 2014; Tschang & Almirall, 2021). Some argue that AI will create new employment opportunities, while others suggest that the transition may exacerbate existing inequities and lead to considerable labour disruptions (Arntz et al., 2016; Tschang & Almirall, 2021).

Policymakers and industry leaders must devise strategies to mitigate the negative impacts of AI on employment while leveraging its transformative capabilities. Furthermore, the issue of algorithmic bias has received heightened scrutiny, as AI systems often learn from historical data that may reflect societal biases (Li, 2024; O'Neil, 2016; Whittlestone et al., 2019). Consequently, the implementation of biased algorithms can perpetuate discrimination in employment, finance, and law enforcement, raising ethical questions about fairness and accountability (Barocas & Selbst, 2016; Li, 2024). The literature on artificial intelligence underscores its complex nature and significant influence across multiple areas. As AI technologies advance, it is essential to maintain an ongoing discourse on its transformative impact within higher education institutions. Therefore, this study examines opportunities for AI-driven innovation in teaching, learning, and research in these institutions.

2. Materials and Methods

This study utilised a mixed-methods approach, adopting an explanatory sequential design. As Creswell and Creswell (2018) advise, the researchers conducted the study in two phases. The first phase was quantitative, following all traditional quantitative design precepts, after which a qualitative phase was initiated to help explain the confusing and contradictory results. The population for the study included approximately 15,000 students enrolled for the 2024 academic session and about 350 full-time academic staff at a South African traditional university. Using a sample size calculator with a confidence level of 95% and a 5% margin of error, we determined that an appropriate sample size for the quantitative phase of the study was 375 students and 184 full-time academic staff (we ended up with 187 staff responses). To select these participants, a stratified random sampling technique was employed, with strata based on the six faculties in the university. Below is Table 1, which presents the distribution of the sample. We have used pseudonyms for each faculty member to protect the institution's identity.

Table 1: *Distribution of the sample*

Attribute	Variable	Frequency (n=)	Frequency (%)
Students	Faculty A	63	16.8
	Faculty B	63	16.8
	Faculty C	63	16.8
	Faculty D	62	16.5
	Faculty E	62	16.5
	Faculty F	62	16.5
Staff	Faculty A	32	17.1
	Faculty B	31	16.6
	Faculty C	31	16.6
	Faculty D	31	16.6
	Faculty E	31	16.6
	Faculty F	31	16.6

As is trite with explanatory sequential designs, a follow-up qualitative phase was instituted to explain some of the areas where there was strong disagreement between the staff and student responses. In this follow-up phase, we relied on a sample of five students and three staff members

from each of the six faculties at the university, making a total of 30 students and 18 staff members. While staff were sampled based on their years of experience (a minimum of three years of employment), the students were purposively sampled to satisfy the following criteria per faculty:

- Two undergraduate students (one of whom had to be a final-year student).
- One Honours student
- One Master's student, and
- One PhD student

The study collected quantitative data from participants using a five-point Likert Scale questionnaire, which we named the AI-driven Innovation in Teaching, Learning, and Research Questionnaire (AIDITLRQ). The questionnaire had two sections: the first focused on demographics, while the second aimed to measure how AI-powered technologies can be leveraged for teaching, learning, and research within higher education institutions. The AIDITLRQ consisted of two sub-dimensions with fourteen constructs, namely "Teaching and Learning" and "Research." The questionnaire employed a five-point Likert Scale with response options ranging from "Strongly Agree" to "Strongly Disagree," with a midpoint of "Uncertain." The instrument's validity was confirmed through pilot testing with a sample of thirty-five (35) randomly selected university students and fifteen (15) lecturers, totalling fifty participants for the pilot study.

In the qualitative phase, the researchers conducted follow-up semi-structured interviews in which participants were asked about the quantitative constructs that required further explanation, namely:

- AI-powered tools provide enhanced feedback on assignments and assessments
- AI-powered tools adapt learning content and assessment to individual needs
- AI-powered tools enhance hands-on experiences and foster critical thinking
- AI-powered tools enhance the efficiency and accuracy of research data analysis

These interviews lasted between 30 and 45 minutes each and were recorded with the participants' approval before being transcribed for data analysis. The quantitative data from the questionnaire were analysed using descriptive statistics (simple percentages) to interpret the Likert scale responses, highlighting the distribution of answers across different categories. For the qualitative data, thematic analysis was employed to examine the interview transcripts, identifying recurring patterns and themes through a systematic coding process. This combination provided both statistical insights from the questionnaires and in-depth explanations of participants' reasoning from the interviews.

2.1 Ethical Consideration

This study adhered to all ethical standards and guidelines to ensure the rights, dignity, and welfare of participants were protected (Makura & Omodan, 2024). Informed consent was obtained from all participants prior to their involvement in the study, ensuring that they were fully aware of the purpose, procedures, and potential risks and benefits of the research. Participation was entirely voluntary, and participants were free to withdraw from the study at any point without penalty. Measures were taken to ensure the anonymity of all participants, and no personally identifiable information was collected or shared. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki, ensuring respect for the autonomy, confidentiality, and welfare of participants. Furthermore, the research protocol was reviewed and approved by the Ethics Committee of the University of Fort Hare, with protocol code MNC021SOLA01.

3. Presentation of Results

The study's results are presented sequentially, in alignment with the methodological approach outlined.

3.1. AI-driven innovation in teaching and learning

The findings from the first part of the questionnaire revealed that students were generally more positive than staff with regard to the innovative capabilities of AI. In the case of the enhancement of feedback through AI, as much as 69.5% of the staff gave negative responses (44.4% disagreed and 25.1% strongly disagreed), while as much as 71% of the students gave positive responses (51.5% strongly agreed and 19.5% agreed). When asked about AI and the enhancement of collaboration, majorities in both groups appeared to believe that AI was beneficial for collaboration in the classrooms. This was represented by 69.5% of the staff who gave positive responses (46.5% strongly agreed and 23% agreed) and 68.5% of the students who gave positive responses (20.5% strongly agreed and 48.3% agreed). Concerning the potential to adapt learning content and assessment, staff seemed to be more doubtful and uncertain than students. While a slight majority of 53% of the staff gave negative responses (22% uncertain, 25.7% disagreed, and 5.3% strongly disagreed), as much as 66.9% of students were positive (43.2% strongly agreed and 23.7% agreed). Similar trends were also observed in the responses to AI's potential for hands-on learning experiences and fostering critical thinking skills. Although 65.8% of the staff harboured outrightly negative perceptions (48.7% disagreed and 17.1% strongly disagreed), as much as 65.3% of the students were positive (53.6% strongly agreed and 11.7% agreed). When asked about the potential for AI-powered tools to create a more personalised, efficient, and engaging teaching and learning experience, both groups were generally positive. This was represented by an overwhelming majority of 76.5% of the staff who were positive (22.5% strongly agreed and 54% agreed), and as much as 66.1% of the students who were positive (23.2% strongly agreed and 42.9% agreed). Similar trends were also identified concerning the potential to enhance learning accessibility, where both groups showed strong support for this benefit. As much as 75.4% of the staff were positive (38.5% strongly agreed and 36.9% agreed), while as much as 64.6% of the students were positive (37.6% strongly agreed and a further 27% agreed). When it came to the automation of assessment and instant feedback, both groups also agreed on this benefit. This was represented by 69% of the staff who gave positive responses (27.8% strongly agreed and 41.2% agreed), and 62.1% of the students who were similarly positive (37.6% strongly agreed and 24.5% agreed). Table 2 below presents the findings on the potential of AI to transform teaching and learning at the university.

Table 2: *Staff and student perceptions of AI-driven teaching and learning*

S/N	Item	Strongly agree (%)		Agree (%)		Uncertain (%)		Disagree (%)		Strongly disagree (%)	
		Stff	*Std*	*Stff*	*Std*	*Stff*	*Std*	*Stff*	*Std*	*Stff*	*Std*
1	AI-powered tools provide enhanced feedback on assignments and assessments	14.4	51.5	8.6	19.5	7.5	4.0	44.4	18.9	25.1	6.1
2	AI-driven tools have the potential to enhance collaboration in lecture halls/classrooms	46.5	20.5	23.0	48.3	5.9	7.5	11.2	23.0	13.4	6.1
3	AI-driven tools adapt learning content and assessment to individual needs	16.6	43.2	25.1	23.7	22.0	3.7	25.7	25.1	5.3	4.3
4	AI-powered tools enhance hands-on experiences and foster critical thinking	5.9	53.6	15.0	11.7	7.5	6.1	48.7	4.0	17.1	24.5

5	AI-powered tools transform teaching and learning by creating a more personalised, efficient, and engaging experience	22.5	23.2	54.0	42.9	7.0	9.6	4.3	12.8	5.9	11.5
6	AI-powered tools enhance learning accessibility	38.5	37.6	36.9	27.0	5.9	3.5	7.5	25.9	11.2	6.1
7	AI-powered tools automate assessments and provide instant feedback	27.8	37.6	41.2	24.5	9.6	10.9	20.3	4.5	1.1	10.1

The findings revealed that both groups agreed on the benefits of AI in enhancing collaboration, creating personalised and engaging learning experiences, improving accessibility, and automating assessments. However, there is a clear divide between students and staff regarding AI's role in education. Students tend to be more positive about its potential to enhance feedback, adapt learning content, and foster hands-on experiences, while staff remain more sceptical. To better understand the reasons behind these differences, the researchers conducted a follow-up qualitative phase with participants, in which they were asked about their beliefs regarding AI's potential to enhance assessment feedback and critical thinking.

3.1.1. Feedback on assignments and assessments

The findings generally revealed that while students were positive, lecturers were more apprehensive about the inclusion of AI as an assessment tool. One can consider the views of a student who noted,

> *The use of AI tools for assessment feedback provides us with real-time feedback. I wont have to dread over marks that will require the lecturer to mark and then physically upload, here you just write and as soon as you finish, you get the results. This helps us correct errors and improve our understanding – I like it because you do not get results after forgetting about the test. (Student 9)*

This view contradicted sharply with a lecturer who contended,

> *Students may become too reliant feedback and lose the interest in seeking feedback from lecturers and peers. For me, this is essential for academic growth – learning is a social undertaking and we do not just emphasise the marks, the social aspect must be visible and prominent. Overrelience can lead to poor self-assessment as the tudent will generally not be able to build critical thinking. (Staff 17)*

A student also added,

> *The integration of AI feedback helps revolutionise our learning experiences as students through providing personalised data-driven insights. Things such as knowing how far behind I am lagging behind my peers and where I need to put more effort all become clearer when you use AI – it has ceased to be a guesswork of where I neglect engagement with course content. AI empowers me to take ownership of learning and make informed decisions about my learning progress (Student 15)*

A lecturer argued.

> *These students don't know that the use of AI for assessment feedback can create a false sense of automation, thereby undermining the importance of human interaction and feedback in the learning process. Also, these AI tools may not be able to detect all errors in student submissions, leading to biases in feedback. For example, marking an assignment of a second speaker of English is vastly different from marking the work of a first speaker. That alone can twist the balances unfairly for non-English backgrounds. (Staff 3)*

One can also consider the sentiments of Student 20 who revealed,

> *While lecturers do not like this, I think it is a positive addition, we are able to better interact and understand the learning process through AI. AI tools have helped me to become more self-aware…I can focus on specific areas that need development. It is so amazing because I can get instant feedback – I feel less stressful because I see what went wrong. It's unlike sometimes when we would submit assignments and never get the scripts back, the lecturers only uploaded marks. (Student 20).*

3.1.2. Adapting learning content and assessment to individual needs

The participants were also asked about their views on AI's potential to adapt learning content and assessments to individual needs. The lecturers appeared more apprehensive about this, while students generally embraced AI as a game-changer for teaching and learning. One can consider the sentiments of a lecturer who retorted:

> *I believe that AI tools will be biased and unfair, given that their algorithms tend to perpetuate existing biases in education, leading to unfair assessments and personalised content that reinforces stereotypes. There is a lack of representation of people like us and from our contexts, so this simply means that whatever these tools vomit, does not take into consideration our own contexts. (Staff 7)*

This was contrary to many students who seemed to laud AI tools for the transformation of their learning experiences. Consider the sentiments of a student who said,

> *For me, I appreciate how AI customises learning based on my strengths and weaknesses. It provides instant corrections and suggestions, allowing me to identify areas for improvement quickly. I then adjust according to those suggestions. Sometimes little things like simplifying learning content and notes helps greatly – I am not good with English so to ask these chatbots to simplify some concepts helps me greatly. (Student 11).*

Another student also added,

> *I value the flexibility that AI offers in terms of pacing, it allows me to spend more time on challenging topics and move quickly through areas I may have already grasped. This helps me to learn more effectively. We have moved from a time when the lecturer was the guru, now even if I get confused during the class, I can just lean into AI tools and use question prompts to better understand the lecture. Sometimes asking the lecturer questions from the suggested areas of challenges also helps make the lecture more interesting. So we learn more through the incorporation of AI into teaching and learning. (Student 23).*

Contrasting perspectives were added by a lecturer who outrightly rejected AI and its contributions to their classroom by saying,

> *These chatbots have come with a lot of problems. Nowadays, when you ask questions, students just prompt these bots for answers, and you get answers that are correct but valueless. The focus for me is usually discovery-based learning, learning where we challenge our worldviews and test alternative realities – this has been killed. The views you get are just AI chatbot views…valueless but correct. It crosses the line of academic dishonesty in assessment; you ask students what they think and get a response about what AI chatbots say. This makes lectures tasteless. (Lecturer 9)*

A student reasoned,

> *AI tools have made learning material more accessible for me. They allow for different learning needs across the student population. It has amazing features like text-to-speech, language translations, and other assistive features. I know these things are not perfect, but for non-native English speakers, this makes a huge difference; the attempts at translating help break down complex concepts that some may find easy. I now do not need to constantly follow after a tutor or lecturer and beg for a consultation to better understand lectures; the tools are really helpful for me. I am getting more freedom and can learn at an improved rate. (Student 17)*

3.1.3. Critical thinking

The participants were further requested to discuss the potential of AI in fostering critical thinking within teaching and learning. The responses revealed that while students were generally welcoming of these disruptive technologies, lecturers had reservations about the inclusion of these technologies. A case in point can be drawn from a student who reported:

> *I think many students will agree with me that AI tools have accelerated critical thinking by providing the personalised experience. These tools assist in identifying areas for improvement, they suggest tailored exercises that stimulate critical analysis and problem-solving skills. We are better with AI, we engage better, we cross-check material better, and we work with less stress because whatever you may not understand, you simply ask the tool to simplify…it has been a real gamechanger for us. (Student 30)*

A staff member rejected this potential and argued,

> *AI creates a false sense of competence and hinders students' self-assessment abilities, discourage originality, and stifles the development of creative thinking. Just go to any lecture room and ask a question, you will find most of the students turning to their phones for assistance, even in the most basic of things – this was not the case in our time, we were taught to think and use our brains. So, by providing predetermined solutions and conforming to existing knowledge patterns, these AI tools suppress students' ability to think outside the box, generate novel ideas and engage in divergent thinking. (Staff, 6)*

This was supported by another staff who added,

> *AI undermines cognitive development by spoon-feeding students with pre-packaged information. This is done through the provision of instant answers that come with effortless solutions which deprives our students of the opportunity to engage in critical thinking, problem solving, and knowledge retention. (Staff 10)*

A student, however argued,

> *I believe that AI tools assist in refining critical thinking skills because they allow us to engage in discussion forums and collaborative platforms. We must be moving with the times not sticking to the traditional approaches to learning, AI forces us to be dynamic and move with the times. We must embrace this…I am not saying it does not have problems, but for me the benefits far outweigh the challenges. (Student 27)*

This was further supported by another student who reckoned,

> *These AI tools provide us with access to large amounts of knowledge, enable us to connect the dots, think creatively, and develop solutions to real-world problems. It is wrong to blame technology based on its use by the lazy ones who misuse it constantly. (Student 4)*

3.2. ***AI-driven innovation in research***

The findings from the second part of the questionnaire revealed that students were mostly agreeable in their views of the innovative capabilities of AI in research. When asked about the potential to enhance research productivity, both groups reported majority of positive responses – this was represented by 70.6% of staff (47.6% strongly agreed and 23% agreed) and 74.4% of students (47.5% strongly agreed and 26.9% agreed). In the case of interdisciplinary research collaborations, both groups similarly reported general confidence – this was represented by 61% of staff who reported positive responses (25.7% strongly agreed and 25.3% agreed) and an overwhelming majority of 81.1% of students (43.5% strongly agreed and 37.6% agreed). Regarding changing research methodologies in personalised learning, students and staff were generally positive about AI's role in transforming this landscape – this was reported by 63.7% of staff (41.7% strongly agreed and 22% agreed) and

64.2% of students (27.7% strongly agreed and 36.5% agreed). On the question about AI's potential to facilitate collaboration and knowledge sharing, staff and students were similarly positive – this is shown by 77.6% of staff (36.4% strongly agreed and 41.2% agreed) and 68% of students (40.3% strongly agreed and 27.7% agreed). Concerning the identification and addressing of research gaps, students and staff were also optimistic about the transformative power of AI – this was demonstrated by 73.8% of staff (43.3% strongly agreed and 30.5% agreed) and 71.7% of students (51.2% strongly agreed and 20.5% agreed). The starkest difference was noted in the enhancement of efficiency in data analysis, where the majority of staff were sceptical while students were overwhelmingly positive. This was represented by 77% of staff who flatly denied this potential (54% disagreed and 23% strongly disagreed), while 75.5% of students reported positive responses (53.6% strongly agreed and 21.9% agreed). In relation to the enhancement of reliability and validity of methodologies, both groups were generally positive – this was represented by 73.8% of staff who reported positivity (38.5% strongly agreed and 35.3% agreed) and 64% of students who reported positive responses (30.1% strongly agreed and 33.9% agreed). Table 3 below presents student and staff responses to the potential for AI to transform research innovation.

Table 3: *Staff and student perceptions of AI-driven innovation in research*

S/N	Item	Strongly agree (%)		Agree (%)		Uncertain (%)		Disagree (%)		Strongly disagree (%)	
		Stff	***Std***	***Stff***	***Std***	***Stff***	***Std***	***Stff***	***Std***	***Stff***	***Std***
1	AI-powered tools enhance the productivity of researchers in gathering and analysing data	47.6	47.5	23.0	26.9	3.2	9.9	7.0	2.9	19.3	12.8
2	AI-powered tools facilitate interdisciplinary research collaborations across different fields	25.7	43.5	35.3	37.6	6.4	3.2	23.0	10.9	9.6	4.8
3	AI-powered tools change the landscape of personalised learning in higher education research methodologies	41.7	27.7	22.0	36.5	10.2	2.4	14.4	26.1	11.8	7.2
4	AI-powered tools facilitate collaboration and knowledge sharing among researchers	36.4	40.3	41.2	27.7	4.8	5.6	8.0	22.1	9.6	6.1
5	AI-powered tools can be used to identify and address gaps in research and drive discoveries	43.3	51.2	30.5	20.5	3.2	3.7	12.3	14.1	10.7	10.4
6	AI-powered tools enhance the efficiency and accuracy of research data analysis	4.3	53.6	5.9	21.9	6.4	15.7	54.0	1.9	23.0	6.9
7	AI-powered tools enhance the reliability and validity of research methodologies	38.5	30.1	35.3	33.9	7.5	7.5	5.9	17.9	12.8	10.7

The findings reveal that both students and staff are generally positive about AI's potential to enhance research productivity, interdisciplinary collaborations, and transform research methodologies in personalised learning. Both groups also agree on AI's role in facilitating collaboration, knowledge sharing, and addressing research gaps, reflecting an overall optimism about AI's transformative

impact on research. However, the starkest difference lies in data analysis, where most staff are sceptical, while students are overwhelmingly positive.

To better understand the reasons behind this difference, the researchers conducted a follow-up qualitative phase with participants, asking them about their experiences with AI in research, specifically whether AI helped foster efficiency and accuracy. The findings indicated that while staff were sceptical about the potential of AI, students embraced it widely. One can consider the sentiments of a student who argued:

> *You see I no longer struggle, AI helps me to analyse huge amounts of data with greater accuracy and efficiency, thereby unlocking valuable insights and accelerating the pace of discovery. Even queries that I get from supervisors, I just asked for suggestions on how to solve those problems, and it works quicker. I no longer have to spend days trying to understand feedback from my supervisor. (Student 14)*

These sentiments were supported by another student who added,

> *AI tools in research and academia in general facilitate efficient literature reviews by automating tasks such as keyword extractions, similarity detections and summarisation. All these can assist researchers in quickly identifying relevant articles and extracting key insights, thereby saving time and enhancing the accuracy of findings. (Student 18)*

A lecturer contradicted these views by cautioning,

> *Some of these tools are not transparent with the manner in which they arrive at their conclusions, this makes the user dependent on them for all their research. I am also of the view that AI tools have thinned the line between ethical research and unethical research. You see, most of these people praising AI, if you check closely, they have suddenly started writing faster, analysing findings quicker, and scaling the ladder quite fast…we must ask ourselves the uncomfortable question, "Is this not a baptism of the devil or a coronation of a bandit as king?" (Staff 15)*

Another staff commented,

> *While AI makes people do their work faster, I am not confident that this quickness can satisfy the requirements for efficiency and accuracy. We are making cabbages and couch potatoes out of the next generation of scientists because now they cannot do simple calculations, provide sound reasoning for judgements in the research field, and a whole lot of other things that were viewed as basic knowledge in yesteryears. If we are not careful, the research agenda will be overtaken by these tools. (Staff 13)*

This was contradicted by the sentiments by a student who argued,

> *Most people who are against AI in research make the mistake of thinking that the technology replaces human effort. If we can just correct this and make them aware that this technology has been introduced to compliment human efforts, all the doubts will evaporate. AI has come in to make life easier for us all, even the older generation that is so used to doing things manually. An example is simple things like language editing. (Student 1)*

4. Discussion of Findings

The consensus among participants regarding AI's potential to enhance collaboration, personalise learning experiences, and improve accessibility demonstrates a shared recognition of the technology's capabilities. Students, in particular, exhibit a more favourable view of AI's role in enhancing feedback mechanisms and adapting learning content to meet individual needs. According to Dwivedi et al. (2021), Gligorea et al. (2023) and O'Neil (2016), this enthusiasm can be attributed to the inherent adaptability of AI systems, which can analyse vast amounts of data to tailor educational experiences that resonate with diverse learning styles. The ability of AI to provide immediate

feedback and facilitate personalised learning pathways aligns with contemporary pedagogical trends that prioritise learner-centred approaches.

Conversely, the scepticism expressed by staff regarding AI's potential to enhance critical thinking and the accuracy of data analysis in research is noteworthy. This divergence in perspectives raises important questions about the readiness of educational institutions to fully embrace AI technologies (Alam, 2021; George & Wooden, 2023; Ocaña-Fernández et al., 2019). Staff concerns may stem from a deeper understanding of the ethical implications and potential misuse of AI, particularly in academic contexts where integrity and rigour are paramount. The apprehension surrounding data analysis highlights a critical aspect of AI integration: the need for robust frameworks that ensure transparency, accountability, and ethical considerations in AI applications (Hatcher & Yu, 2018; Li, 2024; Shneiderman, 2020; Whittlestone et al., 2019).

While students are largely optimistic about AI's role in enhancing feedback and fostering hands-on experiences, staff members appear to be more cautious, perhaps due to their experiences and responsibilities in maintaining academic standards. This divide suggests a potential gap in communication and understanding between students and staff regarding the implementation of AI tools (George & Wooden, 2023; Makeleni et al., 2023). Educational institutions must thus prioritise dialogue and collaboration between these groups to foster a more cohesive approach to AI integration (Makeleni et al., 2023). By bridging this gap, institutions can harness students' enthusiasm while addressing the valid concerns of staff, ultimately leading to a more balanced and effective implementation of AI technologies.

The findings also emphasise the potential of AI to enhance research productivity and facilitate interdisciplinary collaborations. Both students and staff recognise the transformative impact of AI on research methodologies, particularly in an era where interdisciplinary approaches are increasingly valued (Dwivedi et al., 2021; Sedkaoui & Benaichouba, 2024). AI's ability to analyse complex datasets and identify patterns can significantly enhance the research process, enabling researchers to address critical gaps in knowledge and drive innovation (Li, 2024; O'Neil, 2016). This shared optimism suggests that, despite differing views on AI's application in teaching and learning, it may serve as a unifying force in advancing research initiatives across disciplines.

Moreover, the agreement among participants regarding AI's role in facilitating collaboration and knowledge sharing indicates a broader trend toward interconnectedness in academia. AI tools can streamline communication and collaboration among researchers, fostering an environment where knowledge is shared more freely and effectively (Dimiduk et al., 2018; Makeleni et al., 2023; Tan et al., 2021). This is particularly relevant in developing countries, where access to resources and networks may be limited. By leveraging AI technologies, institutions can create more inclusive environments that empower both researchers and students to engage in meaningful collaborations, ultimately enhancing the quality and impact of research outputs (George & Wooden, 2023; Katsamakas et al., 2024; Kuleto et al., 2021; Ocaña-Fernández et al., 2019).

However, the stark contrast in perceptions of AI's role in data analysis cannot be overlooked. While students view AI as a powerful ally in enhancing the accuracy and efficiency of data analysis, staff skepticism raises critical concerns about the reliability and validity of AI-generated insights. This discrepancy highlights the need for comprehensive training and support for staff to navigate the complexities of AI technologies (Dwivedi et al., 2021; Sedkaoui & Benaichouba, 2024; Shneiderman, 2020). Educational institutions must, therefore, invest in professional development opportunities that equip staff with the skills and knowledge necessary to utilise AI tools effectively in their research and teaching practices (Makeleni et al., 2023). By doing so, institutions can foster a culture of innovation that embraces AI while ensuring that academic integrity remains a top priority.

5. Conclusions

In conclusion, this study contributes to the growing body of literature on the role of AI in education by expanding on the perspectives of students and staff regarding its potential to transform teaching, learning, and research. Our findings demonstrate a shared optimism about AI's capabilities; however, the differences in perceptions concerning feedback, personalisation, critical thinking, and research efficiency highlight the complexities of integrating AI into educational environments. Moving forward, it is critical for stakeholders to engage in ongoing dialogue, research, and professional development to navigate the opportunities and challenges presented by AI in education. As our study demonstrates, fostering a collaborative approach that prioritises ethical considerations and equity will enable universities to harness the transformative potential of AI while ensuring that it enhances, rather than undermines, the educational experience.

6. Declarations

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References

Alam, A. (2021). Should robots replace teachers? Mobilisation of AI and learning analytics in education. *In 2021 International Conference on Advances in Computing, Communication, and Control (ICAC3)* (pp. 1–12). IEEE. https://doi.org/10.1109/ICAC353642.2021.9697300

Arntz, M., Gregory, T., & Zierahn, U. (2016). *The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis.* OECD Publishing.

Arsovic, B., & Stefanovic, N. (2020). E-learning based on the adaptive learning model: case study in Serbia. *Sādhanā,, 45*(1), 1-16. https://doi.org/10.1007/s12046-020-01499-8

Barocas, S., & Selbst, A. D. (2016). Big data's disparate impact. *Carlifonia Law Review*, 1-63. https://doi.org/10.2139/ssrn.2477899

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies.* WW Norton & Company.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access*, 75264-75278. https://doi.org/10.1109/ACCESS.2020.2988510

Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Dargan, S., Kumar, M., Ayyagari, M. R., & Kumar, G. (2020). A survey of deep learning and its applications: a new paradigm to machine learning. *Archives of Computational Methods in Engineering*, *27*, 1071-1092. https://doi.org/10.1007/s11831-019-09344-w

Dimiduk, D. M., Holm, E. A., & Niezgoda, S. R. (2018). Perspectives on the impact of machine learning, deep learning, and artificial intelligence on materials, processes, and structures

engineering. *Integrating Materials and Manufacturing Innovation*, *7*, 157-172. https://doi.org/10.1007/s40192-018-0117-8

Dumitru, C. (2024). Future of Learning: Adaptive Learning Systems Based on Language Generative Models in Higher Education: In Impact of Artificial Intelligence on Society. *Chapman and Hall/CRC*, 31–42. https://doi.org/10.1201/9781032644509-3

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., & ... Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *nternational journal of information management, 57*(1), 1-47. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

El Naqa, I., & Murphy, M. J. (2015). *What is machine learning?* Springer International Publishing. https://doi.org/10.1007/978-3-319-18305-3_1

George, B., & Wooden, O. (2023). Managing the strategic transformation of higher education through artificial intelligence. *Administrative Sciences, 13*(9), 1–20. https://doi.org/10.3390/admsci13090196

Girasa, R. (2020). *Artificial intelligence as a disruptive technology: Economic transformation and government regulation.* Springer Nature. https://doi.org/10.1007/978-3-030-35975-1

Gligorea, I., Cioca, M., Oancea, R., Gorski, A. T., Gorski, H., & Tudorache, P. (2023). Adaptive learning using artificial intelligence in e-learning: a literature review. *Education Sciences, 13*(12), 1-14. https://doi.org/10.3390/educsci13121216

Goertzel, T., & Pennachin, C. (2007). *Artificial General Intelligence. In: Advances in Artificial General Intelligence: Concepts, Architectures and Algorithms.* Springer. https://doi.org/10.1007/978-3-540-68677-4

Hatcher, W. G., & Yu, W. (2018). *A survey of deep learning: Platforms, applications and emerging research trends.* IEEE access. https://doi.org/10.1109/ACCESS.2018.2830661

Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, 255-260. https://doi.org/10.1126/science.aaa8415

Katsamakas, E., Pavlov, O. V., & Saklad, R. (2024). Artificial intelligence and the transformation of higher education institutions. *arXiv preprint*, 1-30. https://doi.org/10.3390/su16146118

Kuleto, V., Ilić, M., Dumangiu, M., Ranković, M., Martins, O. M., Păun, D., & Mihoreanu, L. (2021). Exploring opportunities and challenges of artificial intelligence and machine learning in higher education institutions. *Sustainability, 13*(18), 1-16. https://doi.org/10.3390/su131810424

Li, Z. (2024). Ethical frontiers in artificial intelligence: navigating the complexities of bias, privacy, and accountability. *International Journal of Engineering and Management Research, 14*(3), 109–116.

Mahesh, B. (2020). Machine learning algorithms-a review. *International Journal of Science and Research, 9*(1), 381–386. https://doi.org/10.21275/ART20203995

Makeleni, S., Mutongoza, B. H., & Linake, M. A. (2023). Language education and artificial intelligence: An exploration of challenges confronting academics in global south universities. *Journal of Culture and Values in Education*, *6*(2), 158-171. https://doi.org/10.46303/jcve.2023.14

Makura, A. H., & Omodan, B. I. (2024). Re-membering the dismembered in university 'politics of process': Strategies for women's empowerment and inclusivity in academic leadership. *Interdisciplinary Journal of Sociality Studies, 4*, 1-16. https://doi.org/10.38140/ijss-2024.vol4.02

Michelucci, U. (2024). *Machine Learning: History and Terminology. In Fundamental Mathematical Concepts for Machine Learning in Science.* Springer International Publishing. https://doi.org/10.1007/978-3-031-56431-4

Ocaña-Fernández, Y., Valenzuela-Fernández, L. A., & Garro-Aburto, L. L. (2019). Artificial Intelligence and Its Implications in Higher Education. *Journal of Educational Psychology-Propositos Y Representaciones, 7*(2), 553-568. https://doi.org/10.20511/pyr2019.v7n2.274

O'Neil, C. (2016). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy.* Crown Publishing Group.

Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers and Education: Artificial Intelligence*, *2*, 1-6. https://doi.org/10.1016/j.caeai.2021.100020

Oviatt, S. (2021). Technology as infrastructure for dehumanisation: three hundred million people with the same face. *In Proceedings of the 2021 International Conference on Multimodal Interaction* (pp. 278–287). Montréal QC: Association for Computing Machinery. https://doi.org/10.1145/3462244.3482855

Russell, S., & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach.* Pearson.

Samoili, S., Cobo, M. L., Gómez, E., De Prato, G., Martínez-Plumed, F., & Delipetrev, B. (2020). *AI Watch. Defining Artificial Intelligence. Towards an operational definition and taxonomy of artificial intelligence.* Publications Office of the European Union.

Sedkaoui, S., & Benaichouba, R. (2024). Generative AI as a transformative force for innovation: a review of opportunities, applications and challenges. *European Journal of Innovation Management*, 1-25. https://doi.org/10.1108/EJIM-02-2024-0129

Sfetcu, N. (2024). *Intelligence, from Natural Origins to Artificial Frontiers-Human Intelligence vs. Artificial Intelligence.* Nicolae Sfetcu. https://doi.org/10.58679/mm97993

Shakina, E., Parshakov, P., & Alsufiev, A. (2021). Rethinking the corporate digital divide: The complementarity of technologies and the demand for digital skills. *Technological Forecasting and Social Change*, *162*, 120405. https://doi.org/10.1016/j.techfore.2020.120405

Shneiderman, B. (2020). Bridging the gap between ethics and practice: guidelines for reliable, safe, and trustworthy human-centred AI systems. *ACM Transactions on Interactive Intelligent Systems, 10*(4), 1–31. https://doi.org/10.1145/3419764

Soori, M., Arezoo, B., & Dastres, R. (2023). Artificial intelligence, machine learning and deep learning in advanced robotics, a review. *Cognitive Robotics*, *3*, 54-70. https://doi.org/10.1016/j.cogr.2023.04.001

Tan, S. C., Chan, C., Bielaczyc, K., Ma, L., Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Aligning education with needs for knowledge creation in the digital age. *Educational Technology Research and Development, 69*(4), 2243-2266. https://doi.org/10.1007/s11423-020-09914-x

Thorn, P. D. (2015). *Nick Bostrom, superintelligence: Paths, dangers, strategies.* Oxford University Press: Oxford. https://doi.org/10.1007/s11023-015-9377-7

Tschang, F. T., & Almirall, E. (2021). Artificial intelligence as augmenting automation: Implications for employment. *Academy of Management Perspectives, 35*(4), 642-659. https://doi.org/10.5465/amp.2019.0062

Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, *LIX*(236), 433-460. https://doi.org/10.1093/mind/LIX.236.433

Whittlestone, J., Nyrup, R., Alexandrova, A., Dihal, K., & Cave, S. (2019). *Ethical and societal implications of algorithms, data, and artificial intelligence: a roadmap for research.* Nuffield Foundation.

Yu, P. K. (2020). *The algorithmic divide and equality in the age of artificial intelligence.* Heinonline.