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Student Perspectives on Optimising AI Tools to Enhance Personalised Learning in Higher Education

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Abstract: This explanatory qualitative paper discusses students' recommendations on how AI tools can be optimised to enhance personalised learning in higher education. There are several obstacles to the successful adoption and application of AI technology, two of which are user acceptance and striking a balance between AI-assisted and conventional teaching techniques. The Technology Acceptance Model is used in this research as a theoretical framework to analyse how users accept and use technology. It makes the case that users' acceptance of technology is mostly influenced by their perceptions of its usefulness and ease of use, which can direct the creation of strategies to enhance the application and efficacy of AI technologies in individualised learning. Open-ended questionnaires were given to 40 University of the Free State students from different faculties as part of a qualitative explanatory case study methodology. The findings reveal that both students and lecturers need to be trained in using AI tools and that there should be a balance between using AI tools and traditional teaching methods to enhance personalised learning in higher education. Considering the findings, the study suggests that institutions and lecturers need to address the challenges posed by AI tools immediately and leverage AI to its full potential in creating an effective and personalised learning environment by establishing clear ethical guidelines and policies for AI usage in higher education and implementing comprehensive AI literacy programs for lecturers and students to ensure they understand the capabilities, limitations, and ethical considerations of AI tools.

Keywords: Artificial intelligence, personalised learning, technology acceptance model, perceived usefulness, ease of use.

1. Introduction

Personalised learning has emerged as a crucial component in the evolution of higher education (Zhang et al., 2020). By tailoring educational experiences to individual student needs, personalised learning aims to enhance engagement, improve learning outcomes, and provide a more effective educational journey (Sadiku et al., 2022; Ouyang, 2022). However, despite its potential, implementing personalised learning faces significant challenges. South African literature on artificial intelligence (AI) highlights that issues such as inadequate infrastructure and ethical concerns persist (Patel & Ragolane, 2024). The integration of AI in this sector is guided by frameworks like the AI8-Point Model, which emphasises the need for strategic planning and collaboration among stakeholders (Patel & Ragolane, 2024). The literature indicates that while AI could significantly enhance productivity, its current implementation remains low, suggesting a need for increased exposure and investment in technology (Phaladi et al., 2022).

Virtual learning is no longer just a peripheral service for higher education institutions; it has become integral to their development. Specifically, it plays a crucial role in shaping the content of educational programs, influencing university administration, and transforming various aspects of the learning process (Barakina et al., 2021). Using artificial intelligence (AI) to improve and modify personalised learning is one viable approach (Zhou et al., 2024). Thus, AI is a transformative tool that can

significantly enhance personalised learning by adapting educational experiences to meet the unique needs of individual students. When effectively integrated into higher education, AI can address the complexities of individual learning requirements, provide adaptive learning solutions, and support educators in delivering a more personalised and impactful educational experience.

AI holds significant promise for enhancing personalised learning in higher education by offering tailored educational experiences that adapt to individual student needs. The ability of AI to analyse large datasets and identify patterns enables the creation of adaptive learning environments that respond dynamically to student performance, fostering increased engagement and productivity (Zhou et al., 2024; Kasneci et al., 2023). Additionally, AI can automate routine administrative tasks, allowing educators to focus on more strategic aspects of teaching, thereby improving overall efficiency and learning outcomes (Hasibuan & Azizah, 2023). Moreover, AI facilitates the development of creative thinking by providing students with more opportunities to explore and engage with content in innovative ways, thus enhancing the relevance and impact of their educational journey. These benefits suggest that when effectively integrated into higher education, AI can significantly contribute to a more personalised, efficient, and impactful learning experience (Sadiku et al., 2022; Ouyang, 2022).

Despite its potential, integrating AI into personalised learning poses several challenges. One major concern is the risk of over-reliance on AI, which could undermine the role of educators in providing critical guidance and inspiration to students (Zhou et al., 2024; Hasibuan & Azizah, 2023). Additionally, the ethical implications of AI usage, including academic integrity issues and potential biases inherent in AI systems, require careful consideration and clear usage guidelines to ensure responsible and fair application (Kasneci et al., 2023). Another challenge is the need for educators and students to develop the necessary skill sets and literacies to effectively navigate AI technologies, which can be complex and prone to errors (Kasneci et al., 2023). Without adequate training and a well-defined pedagogical approach, the benefits of AI may not be fully realised, and its misuse could lead to unintended negative consequences. Therefore, addressing these challenges is essential for AI's successful and ethical integration into personalised learning (Ouyang, 2022; Sadiku et al., 2022).

While the above studies have contributed significantly to understanding how AI can enhance personalised learning in higher education, none have focused on detailed recommendations from students under diverse educational circumstances. Thus, our study adds to the limited literature by advocating for a student-centred approach to enhancing personalised learning through AI tools. Considering this, the study aims to explore student perspectives on how AI can be optimised to improve personalised learning and to suggest actionable recommendations for lecturers and higher education institutions.

1.1 Theoretical framing

We conducted the study using the Technology Acceptance Model (TAM) as a guide. We analysed students' suggestions for optimising AI technologies to improve customised learning in higher education. Davis (1989) developed the TAM to understand how people accept and use technology. The theory is based on two fundamental concepts: Perceived Utility (PU) and Perceived Ease of Use (PEoU). It suggests that individuals' decisions to embrace or reject technology are influenced by these two factors (Davis, 1989). According to PU, people are more likely to use an application if they believe it will enhance their ability to perform tasks (Davis, 1989). Meanwhile, PEoU indicates that even if potential users find an application helpful, they may perceive it as too complicated to use, leading them to conclude that the effort required outweighs the performance benefits (Davis, 1989).

In the context of our study, which focuses on the use of AI tools in higher education, there is a need for actionable insights that advocate for leveraging AI to its full potential in creating an effective and personalised learning environment. TAM aids in understanding the factors that influence the

acceptance and effective use of AI tools, ensuring that the implementation of AI in higher education is both effective and well-received. Our study is grounded in TAM, as we consider it a relevant theory for exploring students' recommendations for optimising AI tools to enhance personalised learning in higher education. The insights gained from applying TAM can inform strategies for implementing AI tools in this context. By understanding the factors that influence student acceptance, educators and developers can design implementation strategies that address potential concerns and maximise the positive impact of AI on personalised learning.

2. Materials and Methods

We adopt a transformative paradigm, which is consistent with a qualitative approach and an explanatory case study design. The transformative paradigm is particularly suitable as it emphasises the understanding of the subjective experiences and meanings that students and lecturers ascribe to artificial intelligence (AI) tools within the context of personalised learning (Merriam & Tisdell, 2015; Brown & Dueñas, 2020). This paradigm enables an exploration of how AI may be optimised to enhance personalised learning by facilitating an in-depth investigation of participants' perspectives. This design allows for a comprehensive analysis of the phenomenon within the context of real-life situations (Yin, 2009; Creswell & Creswell, 2018). The University of the Free State, which encompasses nine faculties, serves as the case study subject.

A total of 40 students from the nine faculties at the University of the Free State participated in the study. Participants were selected purposively to ensure a diverse representation of faculties and varied experiences with AI in education (Palinkas et al., 2015). Additionally, students were encouraged to identify other potential participants who could provide valuable insights for the study and disseminate the link to the questionnaire via WhatsApp to facilitate participant recruitment through the snowball sampling method (Onwuegbuzie & Collins, 2007). The distribution and characteristics of the participating students are as follows:

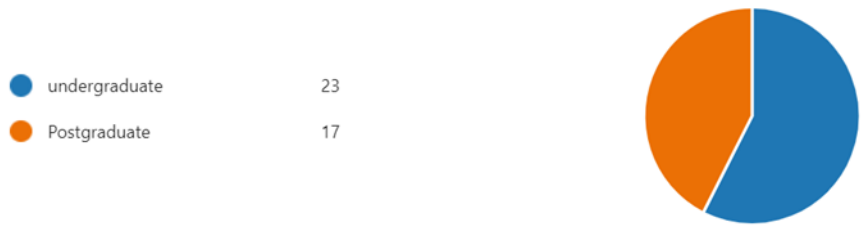

Figure 1: *Distribution of student study level participation*

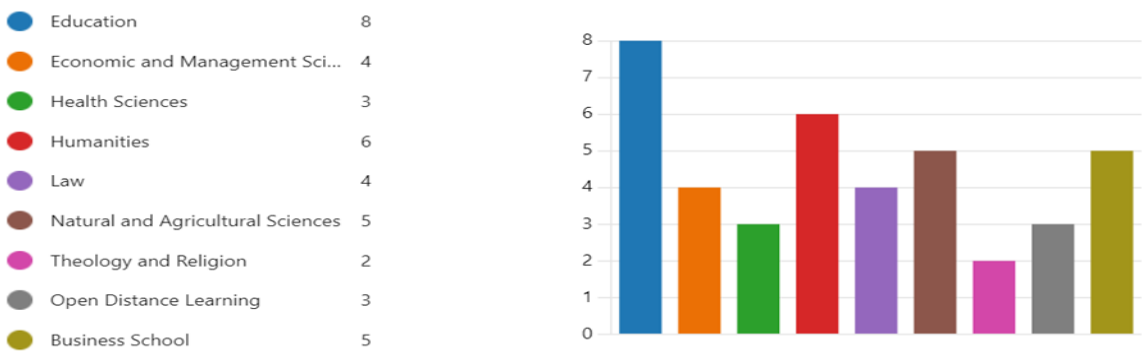

Figure 2: *Distribution of student-faculty participation*

The primary research question guiding this study is: *How can AI tools be optimised to enhance personalised learning in higher education?* A pilot study was conducted involving three students

through semi-structured interviews. However, the students expressed discomfort in participating and were unable to freely articulate their views. Consequently, we opted to develop open-ended questions, and upon reviewing the responses provided, we concluded that students were more comfortable with this data collection technique; thus, we decided to implement it. Data was subsequently collected using open-ended questionnaires developed with Microsoft Forms, an AI-powered tool that facilitates the creation of questionnaires and quizzes. Once the questionnaire was finalised, a link was generated and disseminated to students via the UFS email communication platform and WhatsApp over a period of six weeks. This method aligns with the interpretivist paradigm, enabling participants to articulate their views in their own words, thereby providing profound insights into their recommendations regarding the use of AI in education (Creswell & Poth, 2016; Brown & Dueñas, 2020).

Ethical approval and gatekeeper permission were obtained from the University of the Free State (UFS-HSD2023/1674). Participants were assured of anonymity, and no personal identifiers such as names, emails, or phone numbers were collected. This ensures the confidentiality and privacy of participants, in adherence to ethical research standards (BERA, 2018). Using the six-step thematic analysis method developed by Braun and Clarke (2006), the data was thematically analysed. The steps involved in our study are discussed below.

- **Step 1: familiarising with the data:** We read through the responses from all 40 participants multiple times. Notes and initial ideas were recorded during this phase to capture emerging thoughts on how AI tools were perceived and recommended for enhancing personalised learning.
- **Step 2: Generating initial codes:** We systematically worked through each questionnaire response, coding relevant text segments. Codes such as "user-friendly," "technical support," "maintain balance," and "training needs" were assigned to chunks of data that pertained to these concepts. Coding was done manually without the aid of qualitative data analysis software.
- **Step 3: Searching for themes:** We organised the initial codes into potential themes by grouping similar codes. For example, codes related to "technical issues" and "technical support" were collated under a broader theme of "Addressing Technical Issues." This step involved the creation of initial thematic maps to visualise the relationships between codes and potential themes.
- **Step 4: Reviewing themes:** We reviewed the theme maps and ensured the themes made sense compared to the coded data extracts and the whole dataset. This iterative procedure guaranteed each theme's proper representation of the data. For example, the theme "User-Friendliness and Accessibility" was refined to include specific sub-themes such as "Ease of Use" and "Accessibility for All Students."
- **Step 5: Defining and naming themes:** We wrote detailed descriptions for each theme, explaining what each theme covered and how it related to the research questions. For instance, the theme "Balancing AI and Traditional Methods" was defined as strategies and perceptions related to integrating AI with existing teaching practices. Clear and descriptive names were assigned to each theme to capture the essence of the data.
- **Step 6: Produce the report:** Ultimately, we compiled the final thematic analysis report containing interpretations, participant quotes that exemplified each topic, and thorough descriptions. This paper aimed to give participants a thorough grasp of how AI technologies might be optimised to improve customised learning. The results were interpreted considering the parameters affecting the adoption and use of AI technologies by placing them within the TAM framework.

The thematic analysis offered a comprehensive and nuanced view of the student recommendations by effectively finding patterns and themes within qualitative data. We used three methods to

establish credibility and dependability: audit trail, thorough data description, and triangulation (Lincoln & Guba, 1985). To collect a variety of viewpoints and increase the findings' robustness, triangulation was accomplished by comparing the results from nine distinct faculties and participants, as supported by Santos et al. (2020) and Meydan and Akkas (2024), who indicate that triangulation not only involves different methods or data sources but also embraces the insights of various stakeholders, thereby minimising biases associated with a singular analytical perspective. In-depth explanations of the data and the background were supplied so that readers could comprehend the conclusions and judge how well they applied to other situations. A thorough record of the data collection and analysis procedure was also kept to guarantee transparency and replicability.

3. Presentation and Discussion of Results

This section presents and analyses the data collected from the open-ended questionnaires of 40 students across nine faculties at the University of the Free State. It addresses three primary research questions and 14 prompting questions. However, for this paper, only the responses relevant to the question, "*How can AI tools be optimised to enhance personalised learning in higher education?*" are included. This section is structured around the key themes and sub-themes identified during the thematic analysis, focusing specifically on strategies for enhancing personalised learning through AI tools, as well as on the questionnaires and participants that provided the most pertinent responses to the question. Combining the findings and discussion into one section is consistent with the nature of qualitative research, where the interpretation and contextualisation of data are intertwined with its presentation. This approach allows for a more coherent and integrated narrative that facilitates a deeper understanding of the participants' perspectives.

3.1 Training and professional development

There is a need for comprehensive training programs for lecturers to use AI tools effectively. Additionally, providing students with training on AI tools is crucial to maximise their benefits for personalised learning. Several participants emphasised the necessity of comprehensive and continuous training programs for lecturers to enhance their proficiency and confidence with AI tools. This is supported by Farias and Resende (2020), who argue that training can significantly influence how new technologies are perceived in terms of their benefits and ease of use, leading to increased adoption and usage. The participants also stressed the importance of appropriate training for students to utilise AI tools effectively. To optimise the personalised learning potential of AI and improve student outcomes, it is essential that students receive this instruction (Rakya, 2023). According to Davis (1989), the acceptability of technology depends on its perceived utility and ease of use, both of which can be enhanced through proper training. Participant 36 indicates that higher education institutions should:

> *Embrace AI and train lectures to design assessments that require students to apply knowledge and skills gained from the assignment or module content rather than simply regurgitating information*.

Participant (4) also indicated that:

> *We live in a digital world and lecturers need to acknowledge the fact that students will make sure of AI tools however they just need to teach students to use it at a certain extent and to rely heavily on it.*

Participant (39) echoes similar sentiments and highlights that to embrace the use of AI and the evolving digital; it is imperative that world, it is important that institutions:

> *Train teachers to use AI in the modules so they can have more knowledge and proper control over it; as it stands, students are more knowledgeable than them, making them despise its use.*

Participant (32) concurs and shares that institutions should "*train members and students. Encourage students to share their perspectives and experiences and discuss strategies for using AI responsibly*". In addition, Participant (9) adds that it is important that:

> *the lectures and the university must engage with us to find solutions to implement AI, as this cannot be ignored. adjusting to the use of AI is a need in the 4IR world and must be equipped to compete with the peer in more advanced countries.*

Farias and Resende (2020) support the notion that effective training programs can enhance the perceived ease of use and usefulness of technology, leading to increased acceptance and implementation. Similarly, Davis (1989) asserts that appropriate training enhances perceived usefulness and ease of use, resulting in higher acceptance and effective use of technology. Conversely, Georgina and Olson (2008) and Oigara (2013) contend that the emphasis should not be solely on training but also on redesigning educational practices to integrate technology more holistically. Ertmer and Ottenbreit-Leftwich (2010) and Meisuri et al. (2023) affirm that intrinsic motivation and prior experience with technology also play significant roles and should be considered in training programs.

However, the findings indicate a notable gap in the training provided to lecturers on AI tools, which adversely affects their ability to integrate these technologies effectively into their teaching. Additionally, there is a clear need for structured training programs for students to assist them in utilising AI tools effectively in their learning processes. This suggests that the success of AI implementation in education is heavily reliant on the preparedness and proficiency of lecturers. Without adequate training, the potential benefits of AI for personalised learning cannot be fully realised. Furthermore, this underscores the importance of equipping students with the requisite skills and knowledge to utilise AI tools, which is vital for the success of personalised learning initiatives in higher education.

The Technology Acceptance Model (TAM) posits that training can directly influence perceived ease of use (PEOU) and perceived usefulness (PU), which are critical factors for the acceptance of AI technologies (Davis, 1989). Enhanced training programs can improve lecturers' skills and confidence, thereby increasing their willingness to adopt and effectively utilise AI tools. Additionally, adequate training can enhance students' perceived ease of use and perceived usefulness of AI tools, which are essential for their acceptance and effective use. Improving these perceptions makes students more likely to embrace and benefit from AI technologies.

Consequently, we argue that the successful integration of AI in higher education necessitates extensive training programs for professors. These programs should focus on both technological and pedagogical strategies to effectively employ AI. This aligns with the TAM, which underscores the significance of perceived utility and simplicity in the acceptance of technology (Davis, 1989). Furthermore, we contend that providing students with comprehensive training on AI tools is essential for maximising the benefits of personalised learning. Such training should encompass both the technical functionalities and practical applications of AI in their studies.

3.2 User-friendliness and accessibility

AI tools must be user-friendly and accessible to all students, including those with disabilities, to enhance personalised learning. Participants emphasised that accessibility and usability are critical factors in determining how effective AI tools are in the classroom. McInnes et al. (2023) corroborate this, claiming that Gen-AI's affordability, usability, and ease of adoption can transform digital pedagogy. Furthermore, this is supported by the TAM, which asserts that technology acceptability and utilisation are greatly influenced by perceived ease of use (PEOU) (Davis, 1989). Participant (25) suggested that, to make AI tools accessible to all students, institutions should "*buy licenses to gain access to more accurate information similar to other tools that the university purchases.*" At the same time,

Participant (20) expressed that: "*AI accommodates us as introverts who are embarrassed to ask questions to lecturers.*" Hence, Participant (37) supports Participant (25) by echoing that it is important for institutions to "*secure paid premium version and give students equal access*."

Suppose training is to be provided to students and lecturers to leverage the full benefits of AI as previously discussed. In that case, it is, therefore, imperative that institutions "*regulate the use of AI at university so we can use it well and legally and find ways to be inclusive*", according to Participant (10). Accessibility features are crucial. AI tools should be designed to accommodate students with various disabilities to ensure inclusivity. Thus, Participant (19) supports purchasing AI tool licenses and regulating its use for usage because "*AI has the potential to bridge gaps in education accessibility, especially for students with invisible disabilities such as being slow*."

Therefore, Participant (28) suggest that to have proper control over the AI tools and fair access, it is important that "*Institutions should invest in buying licenses for AI that tailor the module's content to our individual needs as students in different modules or courses*." In addition, AI tools must be intuitive and easy to navigate so that students and lecturers can adopt them effectively. Furthermore, user-friendly interfaces can significantly reduce the learning curve and encourage more students to use AI tools for their studies. Hence, Participant (15) indicates that institutions should "*Give really good training on AI tools, make sure they're easy to use, and add them carefully into the lessons to work alongside regular teaching methods*". At the same time, Participant (13) suggests that "*Lecturers and universities should ensure that AI tools are integrated into our learning and ensure that it is user-friendly. Universities can provide training for both students and lectures*."

The participant's findings highlight the crucial need to create AI tools that are user-friendly and accessible to all students, including those with disabilities. This ensures that these tools can be effectively adopted and utilised in educational settings, emphasising a critical requirement for the successful implementation of AI in education. If AI tools are not user-friendly and accessible, their potential benefits for personalised learning cannot be fully realised, leading to underutilisation and possible exclusion of students with disabilities. McInnes et al. (2023), Joo et al. (2014), and Panda and Kaur (2023) agree that ease of use and accessibility are vital factors in the acceptance and effective use of technology. They argue that user-friendly interfaces and inclusive designs can significantly enhance the adoption of educational technologies.

In contrast, Abas et al. (2023) contend that focusing solely on ease of use and accessibility may overlook other critical factors, such as the pedagogical integration of AI tools and the broader sociocultural context of technology use in education, including ethical considerations. However, we believe that emphasis on user-friendliness and accessibility is essential for the successful integration of AI tools in higher education. By designing AI technologies that are intuitive and inclusive, universities can enhance the perceived ease of use and usefulness of these tools, thereby promoting their adoption and effective utilisation.

This approach aligns with the Technology Acceptance Model (TAM), which underscores the importance of perceived ease of use (PEOU) and perceived usefulness (PU) in technology acceptance (Davis, 1989). Therefore, ensuring that AI tools are user-friendly and accessible directly enhances PEOU, which can lead to higher adoption rates and more effective use of these tools in personalised learning. Additionally, ensuring accessibility supports the principle of inclusivity in education, enabling all students to benefit from personalised learning through AI.

3.3 Balancing AI and traditional methods

Balancing AI tools with traditional teaching methods is important to enhance the overall learning experience. In addition, it is necessary to maintain human interaction in the learning process alongside AI tools.

3.3.1 Integration with Traditional Methods

AI should be used to complement, not replace, traditional teaching methods. This balanced approach leverages the strengths of both AI and conventional pedagogical practices to improve educational outcomes. Wark and Ally (2020) support this perspective, arguing for the integration of new technologies with existing educational frameworks to enhance learning experiences. Furthermore, strategies that ensure AI tools enhance, rather than diminish, human connections in education are important.

AI should not replace traditional teaching methods but rather complement them. Combining both can offer a more comprehensive learning experience. Hence, Participant 14 suggests that lecturers:

> *Integrate AI tools into the curriculum thoughtfully, ensuring they supplement human feedback and creativity. Yes, things like combining AI feedback with personalised feedback from lecturers can ensure that students benefit from the efficiency of AI while still receiving the nuanced insights that only human teachers can provide. Regular check-ins and discussions between students and lecturers can help maintain this balance of using the teacher and AI simultaneously.*

Participant (24) attest that institutions must "*maintain a balance between AI and traditional learning and not replace teachers with AI*". A balanced approach where AI supports and enhances traditional teaching can improve educational outcomes. Hence, according to Participant (23), "*it is important to maintain a balance to foster independent critical thinking skills.*" Additionally, Using AI tools alongside traditional methods is essential to ensure that students get the best of both worlds. Thus, Participant (31) highlights that institutions should "*use AI as a guiding tool, not a replacer of your skills*". Participant (16) agrees that lecturers should "*carefully blend educational tech into the lessons to make learning more personal.*" Additionally, Participant (15) thinks that:

> *AI has lots of potential, but it's important to balance using it for learning with keeping our critical thinking skills sharp. it's important that we use both and not replace the one with the other; both are important.*

The findings emphasise the necessity of integrating AI tools with traditional teaching methods rather than substituting one for the other. This suggests that a hybrid approach can maximise the benefits of AI and traditional methods, addressing various learning styles and needs. It also implies that educational institutions should focus on creating a synergy between AI and conventional pedagogical practices. Wark and Ally (2020) support integrating technology with traditional methods, arguing that this combination can enhance learning by leveraging the unique strengths of each approach. Duncan and Larson (2012) also found that blended learning, combining traditional and digital methods, can be more effective than traditional or digital learning alone. Siregar et al. (2019) argue that media do not influence learning outcomes. The content and instructional strategies are what matter, suggesting that the focus should be on effective pedagogy rather than the tools used.

A well-rounded strategy incorporating AI with conventional teaching techniques is necessary to maximise both advantages. By meeting a variety of learning needs and preferences, this synergy can improve academic results. By amalgamating artificial intelligence's inventive potential with the efficacy of conventional techniques, universities can establish a more encompassing and diverse learning milieu. This approach aligns with the TAM developed by Davis (1989), which emphasises the importance of perceived usefulness and user-friendliness in adopting new technology, where perceived utility (PU) and perceived ease of use (PEOU) are enhanced by combining the benefits of artificial intelligence (AI) with traditional methods. This tactic can increase the overall effectiveness and uptake of AI tools in the classroom.

3.3.2 Maintaining human interaction

It is important to ensure that AI tools supplement traditional learning methods and maintain a balance between AI tools and lectures. This viewpoint is supported by Joy and Garcia (2019), who argue for the importance of interpersonal interaction in effective communication and learning. Furthermore, they indicate that technology-based and conventional delivery media do not significantly influence learning effectiveness, as effective pedagogical practices matter more. Hence, AI tools should enhance human interaction, not replace it. Personal interaction is crucial for a holistic learning experience. Hence, Participant (13) agrees that:

> *yes, it is important to maintain a balance between AI-driven learning and traditional teaching methods. Therefore, collaboration is important between the AI and the lecturer. Yes, AI offers many benefits, but lecturers as humans and mentors cannot be replaced.*

Furthermore, maintaining a human touch in education is essential. AI should be used to support, not substitute, personal interactions. Thus, Participant (17) is of the view that students could:

> *Use AI tools to help with research, but don't rely on them completely. It's important to keep using traditional research methods too. It's really important to balance using AI tools with sticking to traditional ways of doing research, especially in humanities studies. This helps keep our research deep and allows for creative exploration.*

Participant (2) also agrees, "*To enhance personalised learning, educators should embrace diverse teaching methods*". This leads us to the suggestion made by Participant (19), who indicates that lecturers "*should also equally incorporate AI and old teaching ways for AI to be fully beneficial*".

In addition, institutions need to ensure that AI tools don't lead to less face-to-face interaction, as personal connections are vital for effective learning. Hence, for Participant (3), lecturers and institutions must "*Ensure that students use it efficiently and try to keep relations with their students*." In support of this argument, Participant (12) offers a suggesting that:

> *AI must be integrated in learning and teaching by using multiple models, teacher can use Ai and themselves. Teachers should be facilitators of AI to properly control its use and guide students towards personalised learning by offering additional support where necessary.*

The findings highlight the critical role of human interaction in education and the need to preserve it, even with the increasing use of AI tools. This indicates that while AI can offer significant benefits, it should not come at the expense of reducing human interactions, which are fundamental to learning. Educational strategies should focus on integrating AI in ways that enhance, rather than diminish, personal connections.

Joy and Garcia (2019) support the importance of maintaining interpersonal interactions for effective communication and learning. Additionally, Sickel (2019) argues that social presence and AI tools are crucial for creating a meaningful and engaging educational experience, emphasising the need for teachers as a critical variable in instructional success. Bakti et al. (2023) concur, asserting that AI can improve the efficiency and effectiveness of learning by providing personalised guidance, support, or feedback to students. However, they stress that AI is not a substitute for teachers. Furthermore, McInnes et al. (2023) contend that Gen-AI-human collaborations can produce outcomes in course design and development that are more innovative, creative, and efficient than solo endeavours. Similarly, we agree that preserving human connection during learning is essential, even when AI tools are included.

Personal connections and interactions are fundamental to creating a supportive and effective educational environment. AI should be used to enhance and facilitate these interactions, not replace them. From the perspective of TAM, this finding reinforces the idea that AI in education should be

designed to enhance and support human interactions, making them more effective and easier to manage. This approach aligns with the principles of TAM, which are critical for accepting and adopting new technologies (Davis, 1989). By focusing on these aspects, educational institutions can foster an environment where AI is seen as a valuable and accessible tool, leading to greater integration and positive outcomes in the educational process.

3.4 Addressing technical issues and reliability of AI tools

Robust technical support is essential for AI tools to be used successfully in higher education and to maintain their perceived usefulness and usability over time. Quick and dependable technical support reduces annoyance and builds user trust in AI solutions. Tomsett et al. (2020) support this idea, arguing that interpretable and uncertainty-aware AI can quickly calibrate trust, helping decision-makers recognise the limitations and anticipated failures of the AI system and reducing user irritation and confidence. In addition, technical disruptions and unreliable performance can undermine the perceived usefulness of AI tools, which is critical for their sustained use in education. This perspective is supported by Davis (1989), who emphasises the significance of reliability in the perceived usefulness and ease of use of new technologies.

Immediate technical support is essential. Without it, students and lecturers can become frustrated and may stop using AI tools altogether. Knowing that reliable technical assistance is available gives us the confidence to use and experiment with AI technologies in our studies. Technical issues are inevitable, but having a robust support system can make a big difference in how we perceive and use these AI tools. Hence, Participants (39) emphasise that it is crucial for institutions to *"ensure support is available."* Furthermore, Participant (26) supports the idea that to ensure that technical support is available to lecturers and students, it is important that institutions:

> *Buy licenses or some sort of ownership to make sure all learners have access and that there is a central point to deal with or address technical issues promptly.*

AI tools need to be reliable. If they keep malfunctioning and providing incorrect or misleading information, it becomes difficult to trust and rely on them for learning. Consistent performance of AI tools is key. Misleading information can cause significant setbacks in the learning process. Furthermore, ensuring that AI tools work reliably can enhance confidence and willingness to use them regularly. As such, Participant (25) believes that institutes should "*buy licenses to gain access to more accurate information similar to other tools that the university purchases*" to avoid frequent inaccuracies of free versions of AI tools. Participants (22) add to this notion by indicating that students and lecturers are advised to take "*time to ensure the content and information supplied is accurate and relevant as sometimes it's wrong*." In addition, Participant (11) indicated, "*I recommend that they recommend and allow the learners to use AI in their studies, recommending the authentic ones*."

The findings emphasise the importance of having reliable technical support to ensure the effective use of AI tools and prevent frustration. AI tools must be reliable and consistent in their performance to maintain user trust and encourage regular use. This suggests that the presence of technical support is a critical factor in the successful implementation of AI technologies in education. Without adequate support, technical issues may discourage users, leading to decreased adoption and utilisation of AI tools. Furthermore, this underscores the importance of reliability when implementing AI technologies in education. Unreliable AI tools can lead to frustration, decreased trust, and ultimately lower adoption rates, hindering the potential benefits of AI in personalised learning.

According to Biundo-Stephan et al. (2011), hybrid planning is a technique that combines procedural knowledge and causalities to provide user-centred assistance, thereby reducing user irritation and increasing confidence. They also note the importance of advanced user assistance based on AI planning. These findings support the idea of reliability. Schmidt et al. (2020) further confirm that openness in decision-making in AI might undermine trust and reduce user confidence in these

products. Additionally, Davis (1989) provides evidence for the notion that the perceived usefulness and ease of use of technology are strongly influenced by its reliability. According to his Technology Acceptance Model (TAM), user acceptance and continuous use depend on dependable performance.

The effective application of AI tools in higher education requires strong technical assistance. Educational institutions can promote the acceptance and efficient use of AI technology by reducing user dissatisfaction and boosting user confidence through prompt and dependable help. This strategy aligns with the TAM, emphasising the significance of perceived utility and simplicity in accepting new technology (Davis, 1989). Ensuring the reliability and consistency of AI tools is crucial for their successful integration into higher education. Reliable AI technologies can maintain user trust and encourage regular use, maximising their potential benefits for personalised learning. Additionally, focusing on reliability can mitigate the risk of misleading information, which can negatively impact the learning process.

4. Conclusions and Recommendations

This study has explored the integration of AI tools in higher education, focusing on the need for robust technical support and reliable AI technologies to enhance personalised learning. The findings indicate that immediate and reliable technical assistance is essential for mitigating user frustration and enhancing confidence in AI tools. Additionally, ensuring the reliability and consistency of AI tools is critical for maintaining trust and encouraging their regular use.

Participants from various faculties at the selected university emphasised the importance of retaining human connection in learning and how AI should supplement conventional teaching techniques rather than replace them. The study highlights the significance of a well-balanced strategy that complements current educational frameworks and uses AI to strengthen, rather than weaken, interpersonal relationships. This integration can create a more comprehensive and inclusive learning environment, catering to diverse learning preferences and needs. Furthermore, we recommend that institutions conduct ongoing research and evaluation to assess the impact of AI tools on personalised learning. Feedback from students and lecturers should be regularly collected and used to make improvements. This continuous evaluation will help identify best practices and address any challenges.

To maximise the potential of AI in personalised learning, we contend that educational institutions must prioritise five factors: the consistent performance of AI tools, balanced integration with traditional techniques, dependable technical support, and the preservation of human connection. By doing this, universities can transform higher education by developing a more flexible, inclusive, and productive learning environment that caters to each student's unique needs. This argument emphasises the importance of perceived usefulness and simplicity in technology acceptance, which is consistent with the concepts of the Technology Acceptance Model. Educational institutions can promote increased adoption and more efficient use of AI tools by addressing these crucial criteria, ultimately improving the quality of education.

4.1 Limitations and suggestions for future research

One of the primary limitations of this study is its reliance on qualitative data collected through open-ended questionnaires. Although this approach provides in-depth insights into participants' experiences and perceptions, it may not capture the full range of perspectives across a broader population. Furthermore, the study's sample size is limited to 40 students from nine faculties at the sellected University, which may not accurately reflect students' experiences in other academic settings. A notable limitation of the study is the potential for self-selection bias, whereby those who voluntarily responded to the questionnaire might have a disproportionate interest in or familiarity with AI techniques, thereby distorting the findings. Additionally, the six-week duration of the study may not have been sufficient to collect data for analysing the long-term impacts and effectiveness of

AI tools in education. The study also focuses primarily on the perceptions and experiences of students, with less emphasis on the perspectives of lecturers and institutional administrators. This limited scope may overlook important factors related to the implementation and support of AI tools from an administrative or instructional standpoint.

In response to the study's limitations, it is suggested that future research should address these constraints by incorporating a larger and more diverse sample of participants from multiple educational institutions. This more expansive approach would facilitate a comprehensive understanding of the effects and challenges associated with the integration of AI tools in higher education. Further research could employ a mixed-methods approach to validate and build upon the findings, integrating quantitative data and qualitative insights. This methodology could encompass surveys with larger sample sizes, experimental designs to measure the effectiveness of AI tools, and longitudinal studies to assess the long-term impacts on personalised learning outcomes.

Moreover, research should also examine the perspectives of lecturers and institutional administrators to gain a more holistic view of the implementation process. Understanding the challenges and support needs from both instructional and administrative perspectives can inform more effective strategies for integrating AI tools in educational contexts. Furthermore, future studies could investigate the specific types of AI tools and technologies that most effectively enhance personalised learning. Comparative studies examining different AI applications and their impacts on various aspects of learning—such as engagement, retention, and academic performance—would provide valuable insights into best practices for AI integration. Ultimately, it is imperative to investigate the ethical ramifications and data privacy issues associated with the application of AI in education. Subsequent investigations should explore the impact of these concerns on the adoption and efficacy of artificial intelligence instruments, formulate protocols to address ethical dilemmas and ensure the responsible application of AI tools in educational environments.

5. Declarations

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