Artificial Intelligence: Experiences of Students on AI tools Usage for Educational Development

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Abstract
This study explores the experiences of students using artificial intelligence (AI) tools for educational development at a rural university in the Eastern Cape. The purpose of the research is to assess how AI tools are integrated into the learning environment and their impact on student engagement, accessibility, and personalized learning. A qualitative approach was employed, utilizing design science research methodology. Data were collected through focus group discussions with final-year students, and the findings were analyzed using NVivo software to identify key themes. The results indicate that AI tools have a positive impact on students' learning experiences, particularly in terms of enhancing accessibility, fostering personalized learning, and increasing student engagement. However, challenges such as over-reliance on technology and ethical concerns were identified as significant issues. The implications of these findings suggest that while AI offers transformative potential for education, its integration must carefully consider ethical implications and balance with traditional teaching values. The study highlights the need for continued research and thoughtful implementation to optimize the benefits of AI tools in educational settings.

Keywords: Artificial Intelligence, Educational Development, Learning management system, ChatGPT, post-COVID-19.

Introduction

AI tools, such as adaptive learning platforms, virtual tutors, and automated grading systems, are designed to support both students and educators. These tools analyze vast amounts of data to tailor educational content to individual learning styles and needs, fostering a more personalized learning experience[1]. For instance, AI can adapt study materials based on a student's

[1] Funda, Vusumzi, and Roxanne Piderit. "A Review of the Application of Artificial Intelligence in South African Higher Education." March 2024. https://doi.org/10.1109/ictas59620.2024.10507113.

performance, allowing them to learn at their own pace and focus on areas where they need improvement.

The COVID-19 pandemic has irrevocably transformed the educational landscape, leading to a significant shift towards hybrid learning models that combine in-person and online educational experiences[2]. As universities adapt to this new normal, the integration of Artificial Intelligence (AI) tools has emerged as a pivotal element in enhancing the learning experience for students [3]. This exploration focuses on the role of AI in hybrid learning environments, particularly among university students, and examines how these tools can foster personalized, inclusive, and effective educational experiences. Exploring the use of Artificial Intelligence (AI) tools in hybrid learning in the university in the post covid-19 reveal significant transformation in the educational practices[4]. In view of this, Artificial Intelligence has emerged as a pivotal component in the evolution of hybrid learning environments. It facilitates personalized learning experiences by analyzing students' data to tailor educational content individual learning styles and preferences.

According to [5], Artificial Intelligence (AI) tools are becoming increasingly common in people's lives, with educational field being the most reflective on the importance of its adoption. It is transforming various industries, and education is no exception.

AI has the potential to revolutionize the way education is delivered and assessed, leading to better educational outcomes for students. Thus, in the context of a higher education, AI tools become important for students' professional future and competitiveness. The use of AI tools in education has had a significant impact on learning experiences and outcomes[6].

Effective adoption of AI depends on perception and acceptance by university students. Thus, a positive perception will increase the adoption of these technologies by students. It is also important to note that the use of AI in teaching and learning has its limitations. This also stems from worries that students might practice copying and pasting text from sources without undergoing critical analysis, and they may also fail to attribute the work to its original source which amounts to plagiarism[7]. Concerns have been raised regarding plagiarism detection in content

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[2] Owan, V. J., K. B. Abang, D. O. Idika, E. O. Etta, and B. A. Bassey. "Exploring the Potential of Artificial Intelligence Tools in Educational Measurement and Assessment." *Eurasia Journal of Mathematics, Science and Technology Education* 19, no. 8 (2023): em2307.

[3] Park, Y., and M. Y. Doo. "Role of AI in Blended Learning: A Systematic Literature Review." *International Review of Research in Open and Distributed Learning* 25, no. 1 (2024): 164–196.

[4] Molenaar, I. "Personalisation of Learning: Towards Hybrid Human-AI Learning Technologies." In *Blockchain, and Robots*, 57–77. 2021.

[5] Vázquez-Parra, J. C., C. Henao-Rodríguez, J. P. Lis-Gutiérrez, and S. Palomino-Gámez. "Importance of University Students' Perception of Adoption and Training in Artificial Intelligence Tools." *Societies* 14, no. 8 (2024): 141.

[6] Bilad, M. R., L. N. Yaqin, and S. Zubaidah. "Recent Progress in the Use of Artificial Intelligence Tools in Education." *Jurnal Penelitian dan Pengkajian Ilmu Pendidikan: e-Saintika* 7, no. 3 (2023): 279–314.

[7] Halaweh, M. A. S. "Intelligent Information Systems: The 'Humanate' Role of Artificial Intelligence in Information Systems." *Ajman Journal of Studies & Research* 22, no. 2 (2023).

produced by ChatGPT, as well as the challenge of distinguishing between factual and fictional text generated[8].

Method

This research leverages on qualitative method as the adopted methodology, using design science research framework approach for exploring the opinions and experiences of student on their use of AI tools for educational development. Data was collected from 15 students across 3 departments from Information system, Business management, and Economics in the faculty of management and commerce using structured interviews questions. The data was collected in a group focus discussion and transcribed into NVivo. The transcribed document was analyzed using NVivo to generate detailed demographic information and generate a theme for this study.

Design Science Research Framework

The adopted framework that guided this paper is the Design Science Research as shown in Figure 1 below. Design Science. The primary goal of DSR is to generate prescriptive knowledge that informs the design and application of these artifacts in practice.

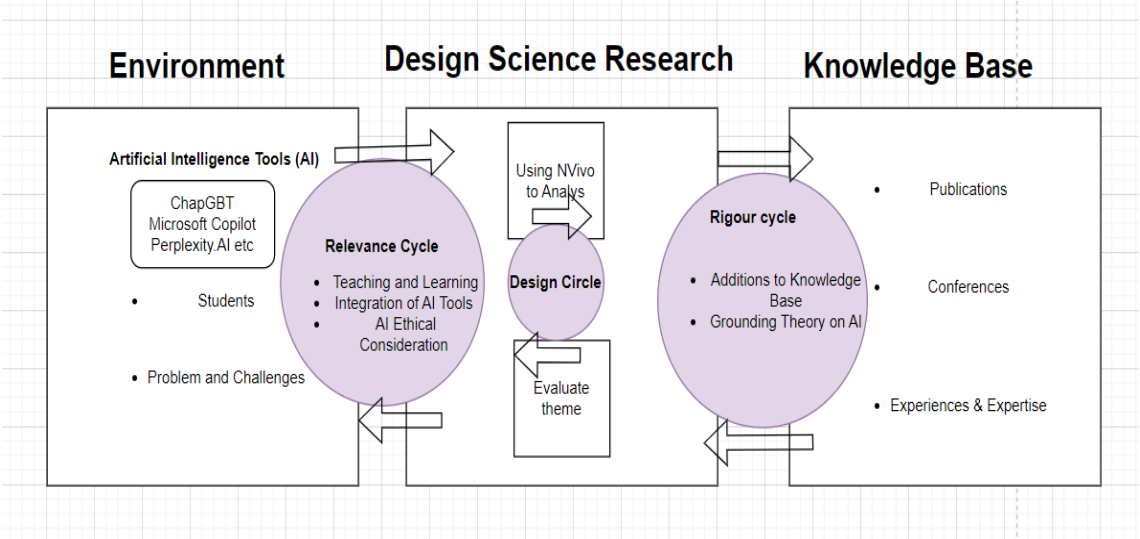

Figure 1: Design Science Research Framework for this study. Source: Author's own (2024)

Figure 1 , shows the DSR framework that guided this study has shown three levels involved which are the environment, design science research and knowledge base. Also, the DSR framework has three cycles for the study framework. The first cycle here is the relevance cycle which focuses on the contextual environment of Artificial intelligence tools usage in educational development. The environment consists of AI tools, (ChatGPT, Copilot and Perplexity AI) students and problem opportunities as highlighted above. The second phase is the design circle

[8] Chatterjee, Jayanta, and Nina Dethlefs. "This New Conversational AI Model Can Be Your Friend, Philosopher, and Guide... and Even Your Worst Enemy." *Patterns* 4, no. 1 (2023).

bridges between the Using NVivo to analysis and theme evaluation is simply the heart of the design science research lifecycles. While the rigor cycle connects the design cycle with publications, conferences and expertise experiences. In this study these three processes are clearly defined and identified as the framework that guides this study on the AI tools usage for educational development.

Design Science Research Iteration Process for this study

Figure 2 outlines the DSR iteration process for this study, the introduction is the first process that brings about the problem identification as the challenges and problems. The second process iteration is the systematic reviews on previous work done which forms the literature review. The third process is the Using NVivo to analyze data collection and data analysis linked to this. The fourth process is the evaluation of the themes generated through results and analysis are linked to the evaluation of themes. The last iteration process is communication of the results through scholarly publications and conferences

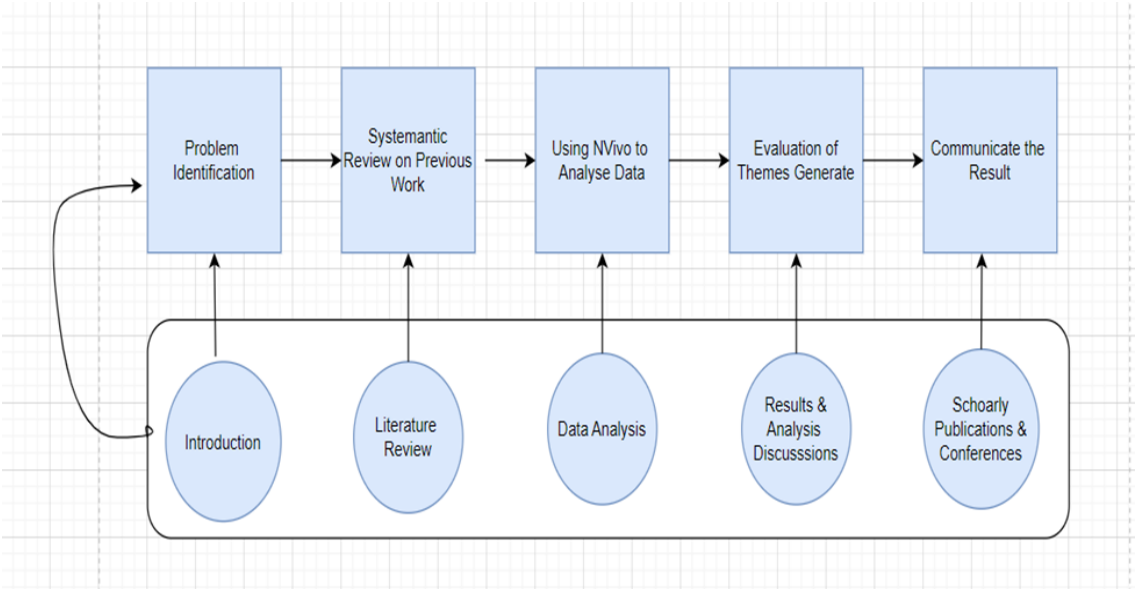

Figure 2: Design Science Research Iteration Process for this study. Source: Author's Own (2024)

Participants and Sampling procedure

The study participants comprise of 15 students in one of the rural universities within the Eastern Cape Province, South Africa. The students are from the 3 departments within the Faculty of Management and Commerce. The study is conducted through structured interview questions around the experiences on the use of artificial intelligence tools in educational development. Each student is invited to take part in the project through recorded guided focus groups and each focus group comprises 5 participants from the department of Economics, Information system and Business management. Focus group interviews is made of final year students. The focus groups discussion recordings are transcribed and analyzed using NVivo 12 software to generate themes of findings for this research study.

Ethical Consideration

Ethical clearance was obtained from University Inter-Faculty Human Research Ethics Committee[9]. A written informed consent form was obtained. The participants students gave their consent after being informed about the study. Participants were well informed that their involvement in the study was non-compulsory.

Results and Discussion

In this study, three thematic themes are generated as a result findings on the experiences of students on artificial tools usage for educational development. The themes of the study were identified based on the data collected, transcribed and imported to NVivo for file classification, creation of code as the generated themes analyzing using NVivo. The three generated themes are accessibility and inclusivity, Personalized Learning and students' engagement.

AI Provide Accessibility and Inclusivity

Accessibility and inclusivity in educational development are essential for creating equitable learning environments that cater to the diverse needs of all students, particularly those who face barriers due to disabilities, socio-economic status, or other marginalizing factors[10]. Accessibility and inclusivity is in line with the submission of Wulandari et al 2024. According to the analyzed data, it created an environment not only to support individual growth but also promote social justice and equity.

<Files\\FGD_Bussiness Management> - § 4 references coded [23.84% Coverage]

Reference 1 - 8.44% Coverage

"AI tools can improve your engagement, as mentioned before, they can help you understand your work which will then make you confident enough to participate in learning environments and have a better engagement with your fellow classmates and lecturer in the classroom. They can also enhance your learning outcomes and ensure that your marks are improved. AI tools helps students who are unable to articulate and express themselves, to better understand ways of expressing themselves in a good way".

Reference 2 - 5.92% Coverage

"AI tools create inclusive learning environments through their adaptability. They essentially function as personal tutors, and with proper context and consistent use, they can adjust to an individual's learning style and their specific course content. This adaptability makes AI a very affordable and accessible alternative to hiring private tutors".

Reference 3 - 5.11% Coverage

"AI tools offer personalized learning for students, supplying them with summaries and notes tailored to their individual needs. It gives students real time feedback and adjustments that will suit the diverse learning styles. AI also has multilingual support (limited) for diverse language backgrounds".

Reference 4 - 4.38% Coverage

[9] IFHREC, 2024

[10] Wulandari, C. E., F. A. Firdaus, and F. Saifulloh. "Promoting Inclusivity Through Technology: A Literature Review in Educational Settings." *Journal of Learning and Technology* 3, no. 1 (2024): 19–28.

"AI tools foster inclusivity by many AI platforms incorporate features for learners with disabilities (e.g., screen readers, voice recognition). Tailoring content to diverse cultural backgrounds ensures that lessons resonate with various student populations".

<Files\\FGD_Economics> - § 2 references coded [27.33% Coverage]

Reference 1 - 23.27% Coverage

"AI can tailor educational content and pace to individual learners' needs, ensuring that all students can learn at their own pace and in a way that is most effective for them. AI can make learning more accessible to students with disabilities by providing accommodations and support, such as text-to-speech, speech-to-text, and closed captioning".

"AI tools make education more inclusive by giving every student the support they need to succeed. They help by providing different learning styles and making resources accessible to everyone. This way, all students have a better chance to thrive in their studies".

"During online lessons they allow us to raise our hands without the face showing or typing in the chatbot which helps students that are shy and a mic for those who aren't shy therefore everybody gets a chance to express their views".

Reference 2 - 4.06% Coverage

"Accessibility: example being learners who are disabled, AI tools can be used for speech recognition and text-to-speech tools or hearing limitation".

<Files\\FGD_Information System> - § 3 references coded [40.16% Coverage]

Reference 1 - 19.41% Coverage

"AI tools can adapt content to suit different learning styles and paces. AI tools provide personalized support, such as virtual tutors, which can help students. Especially the shy learners who are scared to ask questions in the classroom".

"AI tools create inclusive learning environments by offering personalized learning experiences tailored to each student's needs. They support various learning styles, providing options like videos, interactive activities, and text to help everyone learn in a way that suits them best. AI tools also improve accessibility by offering features such as text-to-speech and speech-to-text for students with disabilities".

Reference 2 - 9.13% Coverage

"I think they do in the sense that they are able to offer personalized and adaptive learning experiences. Students can individually utilize these tools in ways that work for them the best and this helps to develop an inclusive learning environment where students of all backgrounds and abilities can succeed".

Reference 3 - 11.62% Coverage

"AI tools can be used by anyone at any level. As more people use these tools, we can get similar information or solutions on how to solve certain problems. People might also refer to the AI tools they use to ensure that everyone uses the one that benefits them and is easier for them to use. Therefore, AI tools do create some sense of inclusivity as they are limitless and are available instantly".

AI Provide Personalized Learning

Personalized Learning on Blackboard refers to the ability of the platform to adapt and tailor the learning experience to the individual needs, preferences and performance of each student. In achieving these personalization features, instructors can create a more engaging, relevant and effective learning environment that caters to the unique needs and goals of students. Based on the research views as reported above, the findings from the students produced the generated theme which is in support of the [11] on personalized learning with educational development as stated below.

<Files\\FGD_Bussiness Management> - § 4 references coded [45.05% Coverage]

Reference 1 - 6.64% Coverage

"I believe that AI tools enhance learning experience in a very efficient way. AI tools as mentioned above, they can help you articulate your words in a very good way, they also help you to do research of different things, and they provide you with different learning materials. AI tools can help you understand your work by summarizing your work in a way that is easier for one to understand".

Reference 2 - 28.81% Coverage

"I truly believe that AI can significantly enhance the learning experience, mainly because of its adaptive algorithms. We all have different learning styles, and what I've found with AI, especially the tools I use, is that they adapt to the way I ask questions. They're constantly asking for feedback, like whether I understood their explanation or if I found it helpful, and based on my responses, they adjust how they reply. This adaptability is key, as the AI remembers my preferences and continues improving its explanations based on my learning style, what I grasp easily, and what I struggle with. If people understood this and realized that AI needs context to provide useful answers, I think they could utilize it far more effectively. You can't just throw a random question at ChatGPT and expect a perfect answer. For instance, when I study, I often copy and paste my notes or textbook excerpts into ChatGPT and ask it to explain them in a way that makes sense to me. I also make my prompts specific, sometimes asking it to explain concepts as if I were a child. This is so helpful because in class, it's not always practical to ask a lecturer to start explaining something from the very basics. AI helps me fill in those gaps. It's also great for essay questions- you can ask it to break down content or review your essay based on the rubric. There's so much AI can offer to improve learning, especially if people understand its underlying processes, like machine learning and algorithms. Even those who use it for less ethical reasons, such as writing tests or essays, could benefit from learning how to use it properly to generate unique and informed responses, rather than generalized ones".

Reference 3 - 3.57% Coverage

"AI enhances the learning experience by providing different perspectives to learning material than the lecturers sometimes would. They simplify the work into manageable chunks, so it does not seem overwhelming".

Reference 4 - 6.04% Coverage

"AI tools enhance the learning experience by Personalization: Adapting content to individual learning paces and styles. Instant Feedback: Providing real-time assessments and feedback, which helps learners adjust their strategies. Resource Accessibility: Facilitating access to a wide range of resources and materials that cater to different learning needs".

[11] Hamill, D. "Using Blackboard (VLE) to Support Teaching Practice of Academic Staff in Response to COVID-19." *All Ireland Journal of Higher Education* 12, no. 3 (2020).

<Files\\FGD_Economics> - § 3 references coded [27.63% Coverage]

Reference 1 - 19.34% Coverage

"AI tools can enhance the learning experience by providing personalized learning pathways, analyzing student performance data, offering adaptive learning resources, and facilitating immediate feedback. These elements ensure that education is tailored to individual needs, helping students grasp concepts at their own pace while enabling educators to measure progress effectively".

"These AI tools make studying easier by giving me resources that fit my needs, making things easy breaking down tough topics and keeping things interesting. Some topics may not be elaborated to a certain depth by lecturers and the AI tools can help us understand better even give real live examples that we did not get".

Reference 2 - 4.53% Coverage

"I believe it helps for individuals who are not very comfortable with one-on-one consultation sessions, they are able to consult in their comfortable spaces via AI".

Reference 3 - 3.76% Coverage

"Personalization: AI tools seem to cater to personalized learning experiences since there are different types of learning styles as well".

<Files\\FGD_Information System> - § 2 references coded [31.66% Coverage]

Reference 1 - 14.95% Coverage

"AI tools expand access to educational resources, which helps me find relevant materials faster, allowing for more effective study sessions".

"I believe AI tools can enhance the learning experience by providing personalized support tailored to individual needs. They can adapt to my learning pace, offering extra help where I struggle and moving faster through areas I understand well. AI can also make learning more interactive and engaging, with features like quizzes, simulations, and instant feedback".

Reference 2 - 16.71% Coverage

"AI tools in learning improve educational experiences by changing information to meet the needs of students, allowing for personalized educational paths, and they also provide real-time feedback which is crucial to students".

"I believe more people will rely more on these tools and do less work for themselves. This could hinder their learning experience as they will take the information given by the AI tool and make it their own. As much as this will help students to discover new information, others will tend to use these AI tools to do their work for them".

AI Provide Platform for Students Engagement

Student engagement is a critical component of educational development, influencing both academic success and the overall learning experience. Engaged students are more likely to participate actively in their education, retain information, and develop essential skills[12]. Enhancing student engagement is vital for fostering an effective educational environment that supports diverse learners.

[12] Salhab, R., and W. Daher. "University Students' Engagement in Mobile Learning." *European Journal of Investigation in Health, Psychology and Education* 13, no. 1 (2023): 202–216.

<Files\\FGD_Bussiness Management> - § 4 references coded [29.47% Coverage]

Reference 1 - 12.32% Coverage

"AI tools can affect your engagement and motivation in both positive and negative ways. They can affect your engagement positively in a way that when you use AI tools such as ChatGPT for research, it can help you understand your research and your work, therefore that can help you engage more in learning environments and it can motivate you to participate more in learning environments because you now have a better understanding of your work, however, it can also affect you negatively, because since you now know that you have AI tools that can answer your questions, you may not engage in learning environments and you may start not asking questions from your lecturers and start asking more information from these AI tools".

Reference 2 - 10.72% Coverage

"AI has had a very positive impact on my engagement and motivation in the learning environment. As I mentioned earlier, my foundational knowledge has become much stronger, and now my focus is on truly understanding the content rather than just cramming to pass a test or achieve a specific mark. Since I'm constantly interacting with AI- asking it questions, and having it explain concepts in various ways with different examples- I find that I'm able to take my time with the material. This approach has allowed me to genuinely learn for the long term, rather than simply aiming for a passing grade and then moving on from the test".

Reference 3 - 2.42% Coverage

"They have helped me improve my writing style for essays as they can detect colloquial language and help me structure my essays more formally".

Reference 4 - 4.01% Coverage

"AI tools positively affect engagement and motivation by many AI platforms use gamified elements that motivate learners to progress. Personalization keeps learners motivated by providing relevant content that aligns with their interests".

<Files\\FGD_Economics> - § 3 references coded [42.39% Coverage]

Reference 1 - 19.20% Coverage

"Truly speaking there are some positive effects at the Same time the impact of AI tools on engagement and motivation in a learning environment depends on how they are used. For instance, normally if you search for health-related matters AI will just tell you straight forward that it's not a human so it cannot provide information on what you've asked. But other than that AI tools provide instant feedback on assessments, and this helps me identify areas for improvement and to stay motivated. Sometimes it helps me to write like a professional and helps me improve my grammar and it makes learning easier for me as it makes difficult concepts easier at my own pace with a better understanding".

Reference 2 - 15.56% Coverage

"AI tools keep me motivated and more engaged because it is keeping my academic record good, they just make studying easy and interesting, and that motivates me to learn and wanting to learn more. Majority of the times it's not in a good way because you become dependent on them and when you don't understand you correct, engage with your peers or lecturers because you think it's the only thing that is correct, sometimes you become less motivated because it can show new things that you didn't learn in class leading to you thinking you haven't learnt anything".

Reference 3 - 7.63% Coverage

"I am a student who likes reading ahead so I'm able to question AI before class. This way in class I'm more engaging, I'm able to explain to students who don't understand in class as well as challenge the lecturer with a few questions since I have a background understanding".

<Files\\FGD_Information System> - § 3 references coded [25.42% Coverage]

Reference 1 - 5.32% Coverage

"AI tools have positively impacted my engagement and motivation in the learning environment in many ways. One being I am able to track my progress and make improvement immediately".

Reference 2 - 9.27% Coverage

"AI tools have positively impacted my engagement and motivation in learning. They make studying more interactive and less monotonous, keeping me interested in longer periods. Personally, good marks motivate me. So, AI tools help me to achieve and maintain good marks, therefore they have a positive impact on me".

Reference 3 - 10.82% Coverage

"People will stop doing their own research and depend on the AI for their research and assignments. This will affect the learning environment as less people will show up for online classes and depend on AI tools to simplify the work done in class in less than 30 minutes. People will engage less with other people and not engage in topics without the help of AI tools".

Discussion

The results of this study highlight key themes in the use of Artificial Intelligence (AI) tools in educational settings: accessibility and inclusivity, personalized learning, and student engagement. These findings were derived from a detailed analysis of student experiences using AI tools, categorized through NVivo. The subsequent discussion will contextualize these findings within the broader theoretical framework of educational technology and compare them with existing literature to determine their contribution to the ongoing discourse on AI in education.

Accessibility and Inclusivity: Alignment with Theoretical Framework and Previous Research

The theme of accessibility and inclusivity strongly aligns with the theoretical framework of Universal Design for Learning (UDL), which emphasizes the need to create learning environments that cater to the diverse needs of all students. The findings of this study indicate that AI tools play a significant role in enhancing inclusivity by providing personalized support to students, including those with disabilities or socio-economic disadvantages. AI tools such as text-to-speech, speech-to-text, and language translation features were frequently cited as helping students with disabilities, thus improving their ability to engage with the learning material. This finding is consistent with prior research that has highlighted the role of AI in enhancing accessibility in education. For

example, studies by Almalki [13]and Baker et al. [14] also demonstrate that AI technologies are essential in fostering more inclusive educational practices, enabling students with diverse needs to participate in the learning process more equitably.

However, the current study goes further by highlighting not only the technological features of AI tools but also their potential to foster social justice and equity within educational environments. AI's ability to adapt to individual learning styles and provide feedback in real time positions it as a tool for achieving greater social equity, especially for marginalized groups. The findings suggest that AI can promote a more equitable educational landscape by addressing the barriers faced by students who have historically been underserved in traditional educational settings.

Personalized Learning: A New Frontier in Education

The second theme, personalized learning, aligns closely with the constructivist theory of learning, which advocates for learning that is individualized and tailored to the learner's needs, experiences, and pace. Personalized learning was one of the most frequently cited benefits of AI tools. Respondents noted that AI tools, through their adaptive algorithms, not only provide instant feedback but also tailor educational content to the student's learning pace and style. This theme is particularly relevant to the discussion of adaptive learning systems in the literature, which have been shown to improve learning outcomes by providing customized learning experiences that adjust to students' specific needs [15].

The research findings build upon and contribute to the literature by offering deeper insights into the mechanics of AI's personalized learning capabilities. Specifically, AI's ability to adjust its responses based on prior interactions with students was mentioned as a unique feature. This feedback loop allows AI tools to improve their assistance over time, making them increasingly effective as students engage with them. This finding supports earlier research on AI's ability to provide adaptive learning experiences [16], but the present study expands this by emphasizing the contextual adaptability of AI, where the tools adjust to specific learner needs in a more dynamic, real-time manner.

Student Engagement: Motivational Dynamics and Ethical Concerns

The theme of student engagement highlighted both positive and negative outcomes from the use of AI tools. On the positive side, many students reported that AI tools helped them engage more deeply with the material, improve their understanding, and build confidence in their academic abilities. This finding aligns with theory of motivation in education, which posits that

[13] Hameeda A. AlMalki and Christopher M. Durugbo, "Institutional Innovation Readiness for Industry 4.0 Education: Towards an Inclusive Model for the Kingdom of Bahrain," *Asian Journal of Technology Innovation* (2023).

[14] R S Baker Smith, J. K., & Williams, S. P., "Artificial Intelligence in Education: Bridging the Gap for Marginalized Students," *Educational Research Review* 13(2) (2019): 75–89.

[15] C A Anderson, "Adaptive Learning Systems and Their Impact on Learning Outcomes," *Educational Technology Press* (2019).

[16] M Johnson Taylor, R. A., & Stevens, M. D., "Personalized Learning: How AI Tools Are Changing Education," *Journal of Artificial Intelligence in Education* 11(2) (2020): 34–48.

student engagement is enhanced when students feel confident and capable of mastering the material [17]. AI tools provide immediate feedback, making learning more interactive and less monotonous, which aligns with self-determination theory that stresses the importance of feedback and autonomy in motivation [18].

However, the study also identified concerns related to AI over-dependence, which could potentially diminish students' intrinsic motivation. Some students reported that AI tools, while providing useful support, might inadvertently reduce their willingness to engage with lecturers or peers. This potential disengagement could lead to a reduced reliance on critical thinking, as students may defer to AI tools for answers rather than attempting to solve problems independently. This concern echoes previous studies by Kulik [19], which found that the overuse of AI tools in education could lead to decreased social interactions and diminished cognitive engagement, particularly when students become overly reliant on automated feedback rather than developing their problem-solving skills.

This study contributes to the existing literature on AI in education by providing empirical evidence of the positive and negative effects AI tools can have on accessibility, personalization, and engagement. While previous research has emphasized the potential of AI to create inclusive learning environments, the current study extends this by highlighting how AI can promote social justice and equity. The personalization theme also enriches the existing discourse by exploring the specific ways AI adapts to students' learning styles and needs in real-time, something that was underexplored in earlier studies.

Furthermore, the study draws attention to the ethical implications of AI in education, particularly the potential for students to become overly reliant on AI tools, leading to diminished critical thinking and reduced engagement in traditional learning formats. This concern points to the need for a balanced integration of AI tools in educational settings, where AI can complement, rather than replace, traditional teaching methods.

The research findings suggest that AI tools have a significant role to play in enhancing accessibility, personalized learning, and student engagement in educational environments. The positive impacts of AI tools on inclusivity and personalized learning are clear, yet the potential risks of over-dependence and reduced engagement warrant further investigation. This study contributes to the ongoing conversation about the ethical use of AI in education, suggesting that while AI has transformative potential, its integration should be carefully considered to ensure that it complements human interaction and encourages active, critical learning.

[17] D H Schunk Pintrich, P. R., & Meece, J. L., "Motivation and Learning in Educational Settings," *Pearson* (2008).

[18] E L Deci & Ryan, R. M., "Intrinsic Motivation and Self-Determination in Human Behavior," *Springer Science & Business Media* (1985).

[19] J A Kulik, "The Effects of Educational Technology on Student Motivation and Engagement," *Journal of Educational Psychology* 38(4) (2019): 1082–1095.

Conclusion

This study has explored the experiences of students with AI tools in the context of educational development, leading to the identification of three key themes: accessibility and inclusivity, personalized learning, and student engagement. The aim of this research was to gain insight into how students perceive and interact with AI tools in their educational journey. The findings indicate that student engagement was the most frequently referenced theme, with 10 coding references, followed closely by personalized learning with 9 references. Accessibility and inclusivity also received 9 references, highlighting the growing importance of ensuring that all students, regardless of their backgrounds, can benefit from AI-supported education.

While the analysis reveals predominantly positive student experiences with AI tools, emphasizing a shift toward more personalized and engaging learning environments, the study also underscores the need for careful integration of these technologies. The advantages of AI are clear: enhanced engagement, immediate feedback, and more personalized learning pathways. However, educators must be mindful of the challenges that come with incorporating AI into educational settings. These challenges include ensuring the ethical use of AI, fostering critical thinking, and preventing over-reliance on technology that could diminish student interaction with their peers and instructors.

The integration of AI in education continues to evolve, and its successful implementation hinges on a delicate balance between embracing technological advancements and maintaining traditional educational values. The study suggests several key recommendations for moving forward:

1. AI Ethical Considerations: It is crucial for educational institutions to develop and implement clear AI ethics policies that guide both students and educators in using these tools responsibly.
2. Integration with Learning Management Systems: Incorporating AI features into established platforms like Blackboard could provide students with more opportunities to engage with AI tools, ensuring that learning is both interactive and effective.
3. Future Research and Policy Development: Future work should focus on further integrating AI tools into the educational ecosystem while addressing the ethical implications of their use. This includes creating a framework for both students and lecturers to use AI tools in an ethical, equitable, and educationally productive manner.

The potential for AI to revolutionize education is immense, and as these tools become more deeply embedded in the learning process, they could offer significant benefits. However, the key to unlocking their full potential lies in thoughtful, ethical implementation, which will enhance educational outcomes while ensuring the integrity of the learning experience for all students. Future research should continue to explore the best practices for AI integration in diverse educational contexts, ensuring that it remains a tool for inclusivity, engagement, and personalized learning.

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Reference

AlMalki, Hameeda A., and Christopher M. Durugbo. "Institutional Innovation Readiness for Industry 4.0 Education: Towards an Inclusive Model for the Kingdom of Bahrain." Asian Journal of Technology Innovation (2023).

Anderson, C A. "Adaptive Learning Systems and Their Impact on Learning Outcomes." Educational Technology Press (2019).

Baker Smith, J. K., & Williams, S. P., R S. "Artificial Intelligence in Education: Bridging the Gap for Marginalized Students." Educational Research Review 13(2) (2019): 75–89.

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