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Investigating the Use of Artificial Intelligence (AI) Tools in Blended Learning for ECP Students Post-COVID-19: Case Study Rural University in Eastern Cape

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Abstract: The role of artificial intelligence (AI) tools in blended learning has become increasingly significant in the post-COVID era. However, challenges were identified in implementing AI integration in the educational sector, which include integration with existing learning management systems, technological literacy, and data security and privacy. The integration of AI tools in blended learning has the potential to revolutionise education in the post-COVID era. The aim of this study is to investigate the use of artificial intelligence (AI) in blended learning for Extended Curriculum Program (ECP) students at the historically disadvantaged institution in the Eastern Cape in the post-COVID-19 era. This research employs qualitative methods as its adopted methodology, involving interviews with final-year ECP students for data collection through focus group discussions. Therefore, the collected data is analysed using NVivo Software to examine the findings. The findings consist of students' use of AI tools for learning and general experiences with AI usage. Furthermore, leveraging AI, educators can create more personalised, engaging, and effective learning experiences that cater to the diverse needs of students. In conclusion, it is crucial to address the challenges associated with AI implementation as mentioned above. In addition, it is better to ensure that all tools are used responsibly and ethically to enhance education more effectively rather than hinder it in the post-pandemic world.
Keywords: *Blended Learning, Artificial Intelligence (AI), Extended Curriculum Program, and post-COVID-19*

1. Introduction and background

Education is one of the most essential sectors of society. It has a significant influence on all other industries and is interconnected with them. Because of this importance, education is essential for every member of society, beyond all barriers. For instance, the education sector faced challenges during COVID-19, prompting numerous scholars to highlight the need for blended learning (Funda et al., 2025). Blended learning, which combines traditional face-to-face teaching with online learning methods, has emerged as a vital alternative to ensure safe distancing and maintain academic continuity during the pandemic.

Due to the ongoing pandemic, alternative teaching methods, such as Blended Learning (also known as hybrid learning), became useful for ensuring access to learning activities during the national lockdown. According to Mahaye (2020), Blended learning is a technology-based teaching approach that integrates face-to-face instruction with online learning. Moreover, blended learning can refer to the process of combining traditional and online learning activities to achieve an enhanced, personalised student experience and outcomes, while also improving the efficiency of teaching practices (Alamri et al., 2021).

However, many societal problems persist and are not limited to pandemics; these include financial concerns, access to education, and barriers to physically attending in-person classes (Park & Doo, 2024). The education sector embraces AI technologies because of the aforementioned issues; its use in teaching and learning is growing every day. This study found a 43% rise in AI applications between 2018 and 2022 during COVID-19 (Ahmad et al., 2021). Despite the benefits of using AI tools, it is important to note that AI in teaching and learning also has limitations (Owan et al., 2023). This also stems from concerns that students might copy and paste text from sources without critical analysis and may fail to attribute the work to its original source, thereby committing plagiarism (Halaweh, 2023). Further, threats and risks associated with using AI tools such as ChatGPT include students being unable to gain a deep understanding due to the limited information provided by ChatGPT and reduced integrity.

Available research on AI tools and blended learning in South Africa is diverse. Researchers such as Dewa & Tshidi (2025) and Sanders and Mukhari (2024) focused on the lecturers' perceptions on the use of AI tools in higher education, while other scholars, such as Machii et al. (2021), Mogoale et al. (2025) and Phokoye et al. (2025) looked at AI tools and blended learning in South African higher institutions, focusing on students. Other researchers, such as Hlophe et al. (2025) and Mhlanga (2021), focused only on blended learning in South Africa. Moreover, available literature employed different methodological approaches to investigate the interrelation between the variables of interest. In contrast to the systematic literature review and the quantitative research approach employed by researchers such as Mogoale et al. (2025), Ntsobi & Mwale (2024), and Phokoye et al. (2025). This study adds to the available literature by employing a qualitative research approach to investigate the use of AI tools in Blended Learning for ECP students' post-COVID-19, focusing on a rural University in the Eastern Cape. Some sections of this paper include the research aims and Objectives, the literature review, the methodology, and the conclusion and recommendations of the study.

2. Literature

Artificial intelligence (AI) is a rapidly evolving field of technology that involves developing intelligent machines capable of performing tasks that typically require human intelligence, such as understanding natural language, recognising patterns, and making decisions based on data (Owan et al., 2023). AI refers to the field of computer science that involves creating computer programs capable of imitating intelligent behaviour and ideally enhancing human-like abilities (Naqvi, 2020). It has been described as the ability of machines to adapt to new and emerging situations, problem-solve, answer questions, create plans, and perform other intelligent functions typically associated with human beings.

According to Wardat et al (2024), AI encompasses the development of intelligent robots capable of eliciting human thought processes and actions. AI tools include Bing and ChatGPT which have been referred to as objects that individuals can use to think with, particularly for learners to enhance their ability to think critically and reflectively, foster

creativity, acquire problem-solving skills, and grasp concepts effectively (Vasconcelos et al., 2023; Owan et al, 2023).

As reported by Rangel-de Lazaro and Duart (2023), artificial intelligence (AI) encompasses various technologies, such as neural networks, machine learning, and algorithms. Artificial intelligence uses computer systems to perform operations and tasks that conventionally and functionally require human intellect, particularly in learning and problem-solving. Using AI technology, educators can now integrate online learning with in-person training, fostering productive collaboration between educators and students. Integrating AI into literacy education is pivotal since it equips students with the skills to navigate an increasingly AI-driven world and make informed decisions. While examining the potential benefits and risks of AI in education, Ozer (2024) noted that AI tools such as ChatGPT have strengths and benefits as they answer and generate information that is highly relevant to the requested topic. This means AI tools such as ChatGPT provide a range of educational opportunities, including educational materials that can support complex learning. Moreover, AI systems, specifically generative AI systems like chatGPT, can transform educational environments from supplementary researchers and the student's learning process to school management policies (Chen et al., 2022).

In addition, artificial intelligence (AI) has become a topic of interest in several fields, including the education sector (Lainjo & Tmouche, 2023). Artificial intelligence is also considered a technological future that makes human life a lot easier (Akinwalere & Ivanov, 2022). According to Fitria (2021), Artificial Intelligence is the process of modeling human thinking and designing machines that can behave like humans. This indicates that AI is also considered part of computer science, enabling machines (computers) to do work just as humans do (Akinwalere & Ivanov, 2022).

3. Theoretical framework

This study adopted the PPA16 (Passive-Participatory AI in education, 6 levels) framework which provides a structured approach to understanding how AI tools can be utilised in educational settings to promote creative engagement among learners (Septiani et al., 2023). The PPAI6 (Passive–Participatory AI in Education) framework is highly important for the study *"Investigating the Use of Artificial Intelligence (AI) Tools in Blended Learning for ECP Students Post-COVID-19"* as it provides a structured lens for understanding how students and educators progressively engage with AI technologies. In Extended Curriculum Programme (ECP) contexts where students often require additional academic support, the framework helps to map the transition from basic awareness of AI tools to active and critical participation in AI-enabled learning environments. This is particularly relevant in blended learning settings supported by platforms such as Blackboard Learn, where AI can facilitate personalised learning, academic support, and flexible access to educational resources. By applying PPAI6, the study is able to assess not only whether AI tools are being used, but also the depth and quality of engagement, which is critical for improving student success and digital inclusion in the post-COVID-19 era (Holmes et al., 2022; Zawacki-Richter et al., 2019). Furthermore, the framework supports the identification of developmental gaps in digital competence and AI literacy among ECP students. Lower levels of engagement (e.g., awareness and access) may indicate limited exposure or lack of confidence, while higher levels (e.g., critical engagement and co-creation) reflect deeper learning and empowerment. This makes PPAI6 valuable for informing targeted interventions such as training, curriculum redesign, and support mechanisms. It also aligns with broader goals of equitable education by highlighting how

AI can be used to bridge learning gaps and enhance participation among historically disadvantaged students (Kako & Abdulazeez, 2022).

However, the PPAI6 framework also presents several limitations in this context. One key limitation is that it is relatively conceptual and lacks standardised measurement indicators, making it challenging to operationalise in empirical studies. This can result in subjective classification of users across the six levels, particularly when assessing diverse student populations with varying levels of digital literacy. Additionally, the framework does not explicitly account for contextual constraints such as limited internet access, inadequate infrastructure, and socio-economic barriers, which are significant factors affecting ECP students in blended learning environments (Ifenthaler & Yau, 2020).

Another limitation is that PPAI6 does not fully address ethical and governance issues associated with AI use, such as data privacy, algorithmic bias, and academic integrity. While it captures levels of engagement, it does not provide guidance on how to manage the risks associated with increased AI adoption. Moreover, the framework focuses primarily on user interaction and may overlook institutional factors such as policy support, lecturer readiness, and curriculum alignment, which are essential for sustainable AI integration (Holmes et al., 2022).

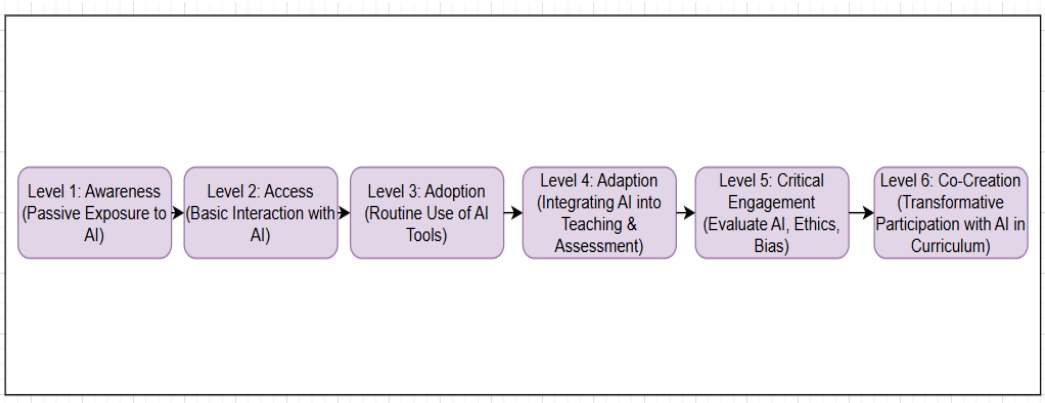

Figure 1: PPA16 Framework AI Engagement Levels As adopted from Prudence 2022

4. Research design and methods

The adopted methodology for this study is leveraging on qualitative approach methods which involves interviewing Extended Curriculum Program students who are in their final year under the ECP program. These participants were chosen because they joined the University in 2022 during COVID-19 and are completing their final year in 2025, post-COVID-19, so their experience with AI tools and blended learning would bring light to the study. The procedure used in choosing these participants, a request letter to participate was sent to all ECP final years through their university email address in Alice and East London campuses, which is the inclusive criteria, ten (10) respondents in each campus agreed to participate.

Table 1: Participants profile

Gender	Age range	Discipline	Year	Campus

12 Females 8 Males	20 - 22	• Business Management • Industrial Psychology • Information Systems • Economics	Final year (4th Year)	Alice and East London campus

The study involves two focus groups; each focus group consists of 10 final year students from Alice campus and ten (10) final year students from East London campus, making it a sample population of 20 ECP final year students for data collection. This then helps us understand better some of the perceptions they hold when using artificial intelligence for blended learning for ECP students. The qualitative method is the approach where researchers seek people's opinion on certain phenomena of a situation or want to know their perception in terms of feelings with less generalization (Peterson, 2019). Literature has shown that a qualitative research approach is consistent with the interpretivism paradigm as it allows participants to tell their stories (Megbowon et al, 2023).

The participants were given an option to choose between participating using online platform or in-person participation (which talks to blended learning) some interviews were conducted using online platform (Microsoft Teams) and some interviews were conducted in-person. The duration of the interview took 60-90 minutes to cover all the interview questions, and language used was English with an understanding that the participants are different in terms of their background; therefore, English was used as a medium of communication. The facilitation of the interviews was conducted by the authors of this study.

4.1 Research Approach

In achieving the main objective of the study, an interpretive paradigm is adopted. It is chosen because it is suitable for a study that examines individuals or small groups in realistic environments (Caga, 2020). According to Peterson (2019) an interpretive paradigm allows the researcher to view the world through the perceptions and experiences of participants. As mentioned by Alharahsheh & Pius, (2020) they assert that interpretivism is more concerned with in depth variables and factors related to context, it considers humans as different from physical phenomena as they create further depth in meanings with the assumption that human beings cannot be explored in a similar way to physical phenomena.

4.2 Participants Sampling Procedure

The participants sampling for this study comprises of 20 ECP students across the two campuses at University of Fort Hare within the Eastern Cape. The participating students were final year ECP students within the Faculty of Commerce and Management. This study was conducted through structured interview questions around the use of artificial intelligence (AI) in blended learning for ECP students. Students were invited to take part in the project through recorded guided focus groups, and each focus group comprises of 10 participants from each campus. The focus group discussions were recorded, and the

recordings were transcribed and analyzed using NVivo 12 software to generate themes of findings for this research study.

4.3 Ensuring Trustworthiness

Credibility

Data triangulation was used to gather varying perspectives on the use of AI tools on blended learning through collecting data from students in different disciplines (Economics, Business Management, and Information systems). Peer debriefing was done with colleagues who are experienced in qualitative research to discuss the findings and interpretations with the aim of assisting highlighting any biases to improve credibility and by Incorporating peer debriefing sessions with colleagues who have different perspectives did assist in inspiring the interpretations and ensuring a more balanced understanding of the data

Transferability

Contextual information about the UFH setting, the University is situated in Eastern Cape which is surrounded by rural areas and the Department of Higher Education and Training (DHET) categorized the institution as one of Historical Disadvantaged Institution (HDI). The kind of students at the institution come from the rural area including ECP students, therefore the findings of the study might take a broad view of other HDIs.

Dependability

To maintain reflexivity, the authors in this study kept a reflective journal throughout the research process considering how background, beliefs, and experiences can shape one's insights and decision-making. This practice allowed the authors to monitor the reflexivity by ensuring that multiple viewpoints and findings remain critical over authors' assumptions and options. Methodological consistency was maintained to make sure that the data collected, and analysis methods are applied consistently.

Confirmability

Engagement with the participants in this study using direct quotes and feedback from participants to support interpretations, to make sure that the findings are grounded in the participant's perspective rather than solely the researcher's interpretations. The study is collaborative work with co-researchers to ensure and provide an additional perspective and insights, ensuring that the conclusions drawn are not solely based on one researcher's interpretation.

4.4 Ethical Consideration

Ethical clearance was obtained from the University of Fort Hare Inter-Faculty Human Research Ethics Committee (IFHREC) with ethics clearance reference number **FUN003-**24 (Project). 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.

5. Findings

5.1 Demographic Information

This study presents the demographic distribution of focus group participants (FGP) across two campuses and multiple academic departments. A total of two focus groups were conducted, one at Alice (FGP 1) and the other at East London (FGP 2), each comprising

participants coded sequentially (P1–P10 and P11–P20 respectively), indicating structured participant identification for data collection and analysis. In terms of institutional representation, participants were drawn from two locations, ensuring geographical diversity within the study. The Alice group appears to include participants in Business Administration and Industrial Psychology, while the East London group includes participants from Information Systems and Economics. This distribution reflects an interdisciplinary sample, capturing perspectives from both business-oriented and technology-related fields. From a demographic standpoint, the table demonstrates that the study incorporates diverse academic backgrounds, which is important for enriching the data with varied experiences and viewpoints, particularly in studies related to technology adoption and curriculum development. The use of coded identifiers (e.g., P1–P10) also ensures participant anonymity and ethical compliance. Overall, the demographic structure suggests a balanced and purposeful sampling approach, allowing for comparative insights across campuses and disciplines while enhancing the credibility and transferability of the study findings. See below the demographic information in Table 2.

Table 2: Anonymous Codes for Focus Group Interviewees

Focus Group Participants (FGP)	FGP Case Number	FGP Use Code	Department
Alice	1	P1-P10	Business Administration
			Industrial Pscychology
East London	2	P11-P20	Information Systems
			Economics

The results for this study generated three (2) thematic themes on the use of artificial intelligence (AI) in blended learning for extended curriculum program ECP students. The themes of the study were identified based on the collected data, which were transcribed and imported into NVivo for file classification, code generation (as themes), and analysis. The three generated themes are AI tool usage experiences, general experiences with AI use, and Learning Analytics.

5.2 Theme 1: Use AI Tools for Learning

As reported by Chen et al. (2022), students' experiences with AI tools reflect a growing trend in educational settings, where these technologies are increasingly integrated to enhance learning and support academic development. Recent surveys and studies highlight both the positive and negative impacts of AI tool use among students. In view of the submission below on the outcome of students' perception, which is in line with the findings of Chen et al (2022). Focus Group Participants - § 10 references coded [23.42% Coverage]

FGP 1 responses as follows

"I have made use of apps such as Studocu and Quizlet to help with multiple-choice questions that may appear in a test. You type in the topics that you will be tested on, and multiple-choice questions as well as answers to those questions are generated. I have also used ChatGPT to assist me with assignments. It gives me a sense of direction on how to complete my assignments, and it assists me with finding information for my assignments, P1. "In my learning journey, I've used AI tools like ChatGPT for instant explanations, machine learning algorithms for personalised pathways, and AI-driven platforms for adaptive quizzes. AI also provides visualisation tools for easier understanding of complex concepts. These tools enhance learning experiences, improve understanding, and aid in

information retention by creating an engaging environment P3". "Some AI tools that I have used in learning are ChatGPT, SamwellAI and ParaphaserAI, ChatGPT: This tool assists with generating ideas, clarifying concepts, and offering explanations on a wide range of topics. It acts as a virtual tutor, providing instant responses, helping me understand difficult subjects, and supporting research by generating outlines or summaries. SamwellAI: This tool might be useful for deeper insights or specialised tasks in learning, possibly focused on specific disciplines or educational tasks like essay grading, providing targeted feedback, or offering structured learning pathways. ParaphaserAI: It helps refine and reword content to improve clarity, ensuring that I can express ideas in a clearer or more concise manner. This tool aids in avoiding plagiarism and enhancing the quality of writing by offering alternative ways to present the same information. By using these AI tools, I've been able to enhance my learning efficiency, improve my writing, and better understand complex topics P5". "I have been using chatbots like Microsoft Copilot and ChatGPT to serve as virtual assistants that can answer questions, provide explanations, and assist with various tasks. They use natural language processing (NLP) to understand user queries and respond in a conversational manner P2". "I have used ChatGPT, Perplexity to guide me on how to do my assignments and Quillbot to paraphrase P8". "The AI tools that I use are Quillbot, it helps me summarise my work and paraphrase most of my work if I am struggling to paraphrase my work. I also use Grammarly, to check if I have articulated myself well in my sentences, and to check if my work makes sense or not and to ensure that my assignments are structured perfectly. These two AI tools, help me with my assignments in such a way that I can write my sentences in a sensible way and if I have made any mistakes in my grammar or not P4". "I mainly use ChatGPT and its specialised versions. For example, when I'm studying marketing, I use a ChatGPT model that's specifically tailored to answer marketing-related questions. Likewise, when I'm studying subjects like databases, I use versions that are designed for those areas. I also use Copilot. With Copilot, I typically upload PDFs or other learning materials and then ask it questions based on that content. That's generally how I incorporate these tools into my studies P9". "I use Grammarly for essays. This tool helps me check all my spelling errors and make sure my writing style is formal. I also use Quilbot when I struggle with referencing P7". "I've utilised various AI tools such as: Smart Learning Platforms: Adaptive learning platforms like Khan Academy and Duolingo that adjust content based on performance. AI Assistants: Chatbots like those on Google Assistant for answering questions and providing instant information.Writing Assistants: Tools like Grammarly that help with grammar and stylistic suggestions, improving writing quality. I used Aithor.com AI, I probably experienced tools that help me write and edit text. Author AI tool assists me with generating ideas, suggesting better wording, checking grammar, or improving the flow of my writing. Author makes writing easier by offering real-time feedback and suggestions to improve quality and speed P10".

FGP 2 responses as follows:

"ChatGPT- I use Chat to help me summarise notes and highlight the important parts P12". I also use Chat to help me paraphrase my assignments P14". "META AI- I use Meta AI to get possible multiple-choice questions that will be asked in a test/exam and practice those P15". "I've used AI tools like ChatGPT, which helps answer questions, explain concepts, and provide ideas for assignments. It gives instant feedback and can simplify difficult topics, making learning more manageable. I've also used Grammarly, which assists in improving my writing by checking grammar and suggesting better ways to phrase sentences. Another tool is Google Scholar, which helps in finding academic resources quickly, making research more efficient. These AI tools save time, personalise my learning, and improve my understanding of subjects P17""In my time as a student, I have used the following AI tools: Google Scholar, ChatGPT, and Aithour, these are

websites that are used for gathering or abstracting information that is on the internet, which makes it easy for students to complete research tasks and understand unclear and complex content. Quilbot and Stealth writer, these websites help to paraphrase content and therefore avoid plagiarism. Mendeley, this tool assists students to reference their work which also helps to avoid plagiarism P19". "The AI tool I have used is ChatGPT. This tool provides us with quick responses and accurate information. It also points out the references as to where they got the information. It is very reliable too that I think most students use. The recent AI tool that I discovered is MetaAI which is also helpful in times of research and other random information P20". "There are few AI's I've used, and I am still using them even now, namely: quillbot and Microsoft Azure Cognitive Services.

QuillBot is an AI-powered writing tool that helps users: Rewrite and rephrase text for clarity and readability, improve grammar, syntax, and sentence structure, generate summaries and key points from content, Translate text between languages

*Microsoft Azure Cognitive Service**s** is a suite of cloud-based AI-powered services that enable developers to build intelligent applications. It includes Vision APIs (image processing, facial recognition), Speech APIs (speech-to-text, text-to-speech), Language APIs (text analysis, sentiment analysis), Knowledge APIs (entity recognition, search) P13"."I frequently use AI tools like Grammarly for writing help, chatbots for quick questions and answers, and some online tutoring platforms that help me to adapt and also how to learn in a higher institution (University) P18". "I have used AI apps like Perplexity even school Black board and meta ai to summarise topics that I did not understand even to get simple ways to remember answers during a test P11". "AI tools I have used is ChatGPT for example. This AI tool I come to when I need more understanding, it helps me with examples, so I really understand what it taught. I also use ChatGPT to unpack assignments, so I answer exactly what the lecturer is expecting of the assignment P16".*

5.3 Theme 2: General Experiences on the AI Usage

The experiences with AI usage highlight a complex interplay between benefits and challenges. While many users appreciate the enhanced efficiency, personalisation, and productivity that these technologies offer, concerns about ethical implications and public perception remain significant (Kelly et al, 2023). As society continues to navigate this evolving landscape, ongoing discussions about regulation, ethical use, and the balance between technology and human oversight will be crucial in shaping the future of AI integration in daily life.

FGP 1 responses as follows:

"My understanding of AI is that it is internet sources that make learning easier by providing feedback to any educational questions that one may have. AI also helps individuals interact online with more knowledgeable people such as tutors P2". "AI tools in learning use artificial intelligence to improve educational experiences and outcomes. These tools can personalise learning, provide tailored feedback, and help educators identify at-risk students, making learning environments more interactive and efficient P4". "AI tools in learning refer to the use of artificial intelligence technologies (ChatGPT, Quilbot) to enhance educational processes. These tools can personalise learning experiences, adapt content to individual needs, and provide instant feedback, making learning more efficient. For example, AI-powered platforms can assess a student's progress and suggest tailored resources, while chatbots or virtual tutors offer on-demand assistance. Additionally, AI tools help automate administrative tasks, allowing educators to focus more on teaching. Overall, AI tools are transforming education by making it more accessible, personalised, and data driven P1". "My understanding about the Artificial

Intelligence (AI) tools is that they are increasingly becoming integral to educational environments, transforming how teaching and learning occur. These tools leverage advanced algorithms and large datasets to perform tasks that typically require human intelligence, such as understanding natural language, recognising patterns, and making decisions based on data analysis P5". "AI tools integrate data from various sources making it easy for student to learn without consulting a textbook and easy to compile assignments. AI tools in learning make it easier to access information, provide personalised help, and assist in understanding difficult concepts. They can create interactive learning experiences and give instant feedback, helping me study better and more efficiently P7". "I understand that AI tools are software applications or websites that are powered by Artificial Intelligence that help people to complete some tasks. In the context of learning, these tools assist students to complete multiple tasks, such as assignments and practice purpose activities P3". "Based on my understanding, AI are tools that help students to enhance their learning. They provide information that is useful and sometimes accurate. These tools ensure that whatever information students need, we can rely on them because of their speediness in responding. These tools are there to ensure that students do their research due diligently. They ensure that the learning environment is easier and flexible. As mentioned, they are less time consuming compared to going to the library to look for a textbook that will help a student with information P9". "I have made use of apps such as Studocu and Quizlet to help with multiple choice questions that may appear in a test. You type in the topics that you will be tested on and multiple-choice questions as well as answers to those questions are generated. I have also made use of ChatGPT to assist me with assignments. It gives me a sense of direction on how to complete my assignments and it assists me with finding information for my assignments P6". "In my learning journey, I've used AI tools like ChatGPT for instant explanations, machine learning algorithms for personalised pathways, and AI-driven platforms for adaptive quizzes. AI also provides visualisation tools for easier understanding of complex concepts. These tools enhance learning experiences, improve understanding, and aid in information retention by creating an engaging environment P8". "Some AI tools that I have used in learning are ChatGPT, Samwell AI and Paraphaser AI, ChatGPT: This tool assists with generating ideas, clarifying concepts, and offering explanations on a wide range of topics. It acts as a virtual tutor, providing instant responses, helping me understand difficult subjects, and supporting research by generating outlines or summaries.

Samwell AI: This tool might be useful for deeper insights or specialised tasks in learning, possibly focused on specific disciplines or educational tasks like essay grading, providing targeted feedback, or offering structured learning pathways. Paraphraser AI: It helps refine and reword content to improve clarity, ensuring that I can express ideas in a clearer or more concise manner. This tool aids in avoiding plagiarism and enhancing the quality of writing by offering alternative ways to present the same information. By using these AI tools, I've been able to enhance my learning efficiency, improve my writing, and better understand complex topics P10".

FGP 2 responses as follows:

"I have been using chatbots like Microsoft Copilot and ChatGPT serve as virtual assistants that can answer questions, provide explanations, and assist with various tasks. They use natural language processing (NLP) to understand user queries and respond in a conversational manner P3". "I've used AI tools like ChatGPT, which helps answer questions, explain concepts, and provide ideas for assignments. It gives instant feedback and can simplify difficult topics, making learning more manageable. I've also used Grammarly, which assists in improving my writing by checking grammar and suggesting

better ways to phrase sentences. Another tool is Google Scholar, which helps in finding academic resources quickly, making research more efficient. These AI tools save time, personalise my learning, and improve my understanding of subjects P1". "In my time as a student, I have used the following AI tools: Google Scholar, ChatGPT, and Aithour, these are websites that are used for gathering or abstracting information that is on the internet, which makes it easy for students to complete research tasks and understand unclear and complex content. Quilbot and Stealth writer, these websites help to paraphrase content and therefore avoid plagiarism. Mendeley, this tool assists students to reference their work which also helps to avoid plagiarism P2". "An example of how AI tools have significantly impacted my learning process was when I had to complete an assignment for a certain module, I was halfway through with the assignment, but I was stuck on the last question. The topic that the last question was based on was not taught to us in class, so we had no slides for this topic. I tried finding the textbook for this module at the library, but I couldn't find it. I tried watching You Tube videos but the information in these videos did not correlate to what was being asked on the assignment question. I made use of AI, and it explained the question step by step and it also gave me useful tips and examples on how to answer the question. After my assignment had been marked, I could see that I got the majority of that question correct thanks to AI P5". "One instance where AI tools significantly impacted my learning process was when I was struggling with understanding complex ERP system concepts for my studies. Using ChatGPT, I was able to ask specific questions about Enterprise Resource Planning and get detailed, easy-to-understand explanations. This immediate support saved me hours of research and clarified concepts I found challenging, making it easier to progress in my coursework P6"."AI tools have significantly impacted my learning process by providing personalised feedback and resources, enabling me to grasp complex subjects more effectively and at my own pace. I have seen a big difference I now pass my assignment as AI guides me on how to do them and I take notes for my tests from AI. When I was struggling to understand an assignment question, AI helped me break it down, so I was able to know what was needed of me. It also helped me on exactly what to search on google scholar to get the required sources P4". "Well, there have been multiple instances whereby I struggled with some complex content that I needed to cover within a short period of time, where then I would use these AI tools to assist me. A time in specific would-be last semester where I needed to complete two research assignments which were due about the same time, the use of these tools significantly improved my productivity, and I managed to complete these assignments within the stipulated time P8"."AI tools play a significant role in our lives, especially when you are a student. I had a tutorial that was due last night. I was stressed as it required a thorough explanation of the points that we listed in the tutorial. With the help of an AI tool, I managed to do some research and get a few points and submitted my tutorial on time before it was due P7". "At the moment, I'm using AI tools mostly for a course I'm doing on data analytics, which is a completely new topic for me. AI has significantly impacted my learning process because the platform I use has learned about the modules I'm studying. It recognises what content I've been learning and how best to explain it to me, having adapted to my style over time. This has made tackling assessments in this course much more manageable, as the AI understands what I know, what I don't know, and makes connections to the content I've been studying. I've been sharing a lot of my learning material with ChatGPT this year and always ask it to use its memory to explain things. It's like having one place where all the knowledge I've accumulated is gathered, and I can rely on this highly intelligent system, which has more experience and expertise than I do, to guide me. Knowing I have access to platforms that can adapt to my needs and my learning style has definitely boosted my confidence in tackling new challenges P10". "One notable instance was using an adaptive learning platform for math. It assessed my competency level and provided targeted exercises, helping me grasp complex topics in

shorter timeframes, which was a significant boost to my confidence. Sometimes, when using AI tools, I've noticed they don't always give reliable answers. For example, I once asked for help with a complex topic, but the AI's response was too basic or slightly off. While AI is helpful most of the time, I still need to double-check certain answers to make sure they're accurate, P9"

6. Discussion of findings

This study generated 2 themes after data collection and analysis using NVivo software, and led to the general discussions. The discussion is guided by general experiences and the usage of AI tools for learning.

Use AI Tools for Learning

Recent surveys and studies highlight both the positive impacts and concerns associated with AI tool usage among students (Chen et al, 2022). The significance of AI tools usage for blended learning is numerous as highlighted in the findings of the study. Therefore, the integration of AI tools in blended learning significantly enhances personalisation, engagement, assessment efficiency, data analysis, accessibility, and resource management, ultimately leading to improved educational experiences for both students and educators. The findings indicate that Artificial Intelligence (AI) tools were increasingly utilized to support learning among Extended Curriculum Programme (ECP) students in blended learning environments following the COVID-19 pandemic. Students primarily engaged with AI-powered tools such as intelligent tutoring systems, automated feedback mechanisms, adaptive quizzes, and AI-assisted content recommendations to support understanding, revision, and self-paced learning. These tools were perceived as particularly valuable in addressing learning gaps caused by disrupted schooling during the pandemic, as they provided immediate feedback and opportunities for repeated practice. This aligns with existing literature suggesting that AI tools can enhance learner autonomy and scaffold learning in blended environments, especially for academically underprepared students.

General Experiences on the AI Usage

Experiences with AI highlight a complex interplay between benefits and challenges. While many users appreciate the enhanced efficiency, personalisation, and productivity that these technologies offer, concerns about ethical implications and public perception remain significant (Kelly et al, 2023). The general experiences of using AI in blended learning highlight its transformative potential in enhancing student engagement, personalising learning experiences, improving academic performance, increasing teaching efficiency, providing valuable data insights, promoting accessibility, and fostering sustainable practices, as highlighted in the findings of the study. As educational institutions continue to integrate AI technologies, these benefits are likely to expand, further enriching the learning landscape. In terms of user experience, ECP students generally reported positive perceptions of AI tools, highlighting ease of access, flexibility, and improved confidence in engaging with course content. Many students indicated that AI-supported learning reduced anxiety and encouraged independent learning, as they could access assistance without fear of judgement. However, the findings also reveal challenges related to inconsistent digital access, limited AI literacy, and overreliance on automated feedback without sufficient human guidance. These experiences reflect broader post-COVID-19 concerns in the literature, where AI adoption has accelerated but remain uneven across student populations.

Overall, the study reports that AI tools do enhance the blended learning experience for ECP students' when integrated in a thoughtful way. But the effectiveness is tied to the

presence of good digital infrastructure, the role of the lecturer as a guide, and the support of pedagogical structures. Also, the data presents that there is a need for a balanced approach to the use of AI tools, which augment rather than replace human interaction in the post-COVID-19 blended learning setting.

7. Recommendations

In conclusion, this study on *"Investigating the Use of Artificial Intelligence (AI) Tools in Blended Learning for ECP Students Post-COVID-19"* demonstrates that AI technologies have become critical enablers in supporting flexible, inclusive, and student-centred learning within Extended Curriculum Programmes (ECP). The findings indicate that AI tools enhance academic support, improve engagement, and facilitate personalised learning pathways, particularly for students transitioning from underprepared educational backgrounds. However, challenges such as limited digital literacy, unequal access to resources, and concerns around ethical use highlight the need for structured support and institutional readiness.

In relation to the PPA16 framework, which emphasises equity, redress, and improved student success in higher education, the study underscores the importance of leveraging AI to bridge learning gaps and promote inclusive education. AI-driven blended learning aligns with PPA16's goals by enabling differentiated instruction, supporting diverse learners, and enhancing throughput rates. Nevertheless, achieving these outcomes requires deliberate investment in infrastructure, capacity building, and policy development to ensure that AI integration does not exacerbate existing inequalities.

8. Conclusion

Overall, the study concludes that while AI holds significant promise for transforming blended learning in ECP contexts, its effectiveness depends on aligning technological innovation with national policy priorities such as PPA16. A holistic approach that combines pedagogical adaptation, ethical governance, and institutional support is essential to maximise the benefits of AI and ensure sustainable, equitable improvements in student learning outcomes in the post-COVID-19 era. However, the following recommendations are suggested as follows:

1. Professional Development for Educators: It will be essential to implement training programs that provide educators with the necessary skills to effectively utilise AI tools in order to realise their full potential.
2. Policy Development: Policymakers should take into account guidelines that promote equitable access to technology for all students and resolve ethical concerns, thereby ensuring that the benefits of AI are accessible across a variety of educational environments.

Recommended future work requires further research is required to evaluate the long-term impact of generative AI technologies on student engagement and outcomes in blended learning contexts as they continue to develop. Hence, integration of AI tools into the Blackboard as Learning management system is also required with ethical consideration.

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