The Effect of Emotional Intelligence on Higher Education: A Pilot Study on the interplay Between Artificial Intelligence, Emotional Intelligence, and E-Learning

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Abstract

Integrating Artificial Intelligence (AI) and E-learning platforms has become increasingly prevalent in the rapidly evolving landscape of higher Education. However, amidst this technological advancement, the role of Emotional Intelligence (EI) and its impact on the efficacy of AI-driven educational tools still needs to be explored. This pilot study seeks to elucidate the intricate relationship between Emotional Intelligence, Artificial Intelligence, and E-Learning in Higher Education. Drawing upon a multidisciplinary approach, this study investigates the correlation between students' Emotional Intelligence competencies and their engagement with AI-driven E-Learning platforms. The findings of this pilot study are expected to shed light on several critical aspects. Firstly, it aims to uncover how Emotional Intelligence influences students' receptivity to AI-infused E-Learning environments, potentially elucidating strategies for optimizing user experience and learning outcomes. Moreover, by exploring the reciprocal influence between Emotional Intelligence and AI algorithms, this research endeavors to contribute to the refinement of AI technologies, fostering greater personalization and adaptability in educational settings. Furthermore, this study endeavors to address the ethical implications inherent in the intersection of Emotional Intelligence, Artificial Intelligence, and E-Learning. By elucidating the potential risks and benefits associated with integrating these technologies, it seeks to inform policymakers, educators, and AI developers alike, facilitating the responsible deployment of AI-driven educational tools. Therefore, its innovative methodology and comprehensive approach aspire to pave the way for future research endeavors, ultimately enriching the educational landscape with insights prioritizing technological advancement and human well-being.

Keywords: E-learning, Artificial Intelligence, Emotional Intelligence, Ethical implications, Engagement and Personalization.

1. Introduction

In the contemporary landscape of higher Education, the amalgamation of Artificial Intelligence (AI) with E-Learning platforms is a testament to the relentless pursuit of innovation and efficiency. This fusion has revolutionized traditional teaching methods, offering unparalleled opportunities for personalized and adaptive learning experiences. However, amidst the fervor surrounding technological advancements, the role of Emotional Intelligence (EI) in shaping the efficacy and ethical implications of AI-driven educational tools remains relatively uncharted territory. Emotional Intelligence, often regarded as a cornerstone of human interaction and decision-making, encompasses the ability to perceive, understand, and manage one's emotions and those of others. In higher Education, where the cultivation of critical thinking, collaboration, and emotional resilience is paramount, the interplay between Emotional Intelligence and AI-driven E-Learning platforms holds profound significance.

This pilot study unravels the intricate relationship between Emotional Intelligence, Artificial Intelligence, and E-Learning in higher education settings. Drawing upon a multidisciplinary framework, it examines how students' Emotional Intelligence competencies influence their engagement with AI-infused educational technologies. By delving into this correlation, the study aims to shed light on how Emotional Intelligence shapes students' receptivity to AI-driven learning environments and its subsequent impact on learning outcomes. Moreover, beyond the individual level, this research explores the reciprocal influence between Emotional Intelligence and AI algorithms. By elucidating how AI technologies can be imbued with emotional awareness and responsiveness, the study aims to contribute to refining educational tools and fostering greater personalization and adaptability in learning experiences.

Furthermore, this study acknowledges the ethical considerations of integrating Emotional Intelligence, Artificial Intelligence, and E-Learning. It endeavors to scrutinize the potential risks and benefits associated with these technologies, aiming to inform stakeholders, including policymakers, educators, and AI developers, about the responsible deployment of AI-driven educational tools. Enriching the educational landscape with insights that prioritize both technological advancement and human well-being aims to catalyze a paradigm shift towards an education system that harnesses the synergies between Emotional Intelligence, Artificial Intelligence, and E-Learning for the betterment of all stakeholders.

2. Theoretical Background

Emotional Intelligence (EI) has garnered significant attention in academic and practical domains due to its profound impact on human behavior, decision-making, and interpersonal relationships. Coined by Salovey and Mayer in 1990 and popularized by Daniel Goleman in the mid-1990s, EI encompasses skills related to perceiving, understanding, regulating, and utilizing emotions in oneself and others.

Within the educational context, EI is pivotal in shaping students' academic success, social interactions, and overall well-being. Research has consistently demonstrated that individuals with higher levels of EI exhibit greater resilience, adaptability, and problem-solving abilities, essential qualities for navigating the complexities of higher Education and beyond.

Artificial Intelligence (AI) has ushered in a new era of technological innovation, offering unprecedented opportunities to enhance teaching and learning processes. AI-driven E-Learning platforms leverage machine learning algorithms to analyze vast amounts of data, personalize learning experiences, and provide timely feedback to students. By harnessing the power of AI, educators can create dynamic and adaptive learning environments tailored to individual learners' unique needs and preferences.

However, as AI permeates educational settings, questions arise regarding its compatibility with human emotions and social dynamics. Critics argue that the emphasis on technological efficiency and automation may inadvertently neglect the socio-emotional aspects of learning, leading to a dehumanized educational experience. This dichotomy between technological advancement and humanistic values underscores the importance of integrating Emotional Intelligence into AI-driven educational tools. Sánchez-Sordo,2019 explores the symbiotic relationship between humans and technology in learning, drawing from theories like the extended mind thesis and Connectivism, and highlights the importance of Emotional Intelligence (EI) in navigating online learning platforms effectively in higher education.

The theoretical framework for understanding the interplay between Emotional Intelligence, Artificial Intelligence, and E-Learning draws upon various disciplines, including educational psychology, human-computer interaction, and ethics. At its core, this framework posits that Emotional Intelligence is a critical mediator between human users and AI technologies, shaping how individuals perceive, interact with, and derive meaning from digital learning environments.

Moreover, by embedding Emotional Intelligence principles into AI algorithms, researchers aim to create more empathetic and responsive educational systems capable of recognizing and accommodating learners' emotional states and needs. This holistic approach enhances the effectiveness of AI-driven E-Learning platforms and fosters a more inclusive and supportive learning environment conducive to students' academic and emotional growth.

In light of the ethical considerations surrounding the integration of Emotional Intelligence, Artificial Intelligence, and E-Learning, scholars advocate for a balanced approach that prioritizes human values, privacy rights, and social responsibility. By critically examining the potential risks and benefits associated with these technologies, educators, and policymakers can ensure the responsible development and deployment of AI-driven educational tools, safeguarding all stakeholders' well-being and dignity.

3. Study Objectives

The following are the study objectives of this paper;

1. To assess the effect of AI-based applications on learning outcomes and academic performance in tertiary learning institutions.
2. The role played by AI in revolutionizing instructional strategies is investigated.
3. To discuss how Artificial Intelligence can develop educators' professional advancement in terms of workload reduction, skill improvement, and training.
4. To categorize and evaluate various classes of educational Artificial Intelligence, such as guidance AI for decision-making, Student AI for improving learners' experience and study efficiency, and teacher AI for teaching, feedback provision, and grading.
5. To analyze the ethical problems related to the widespread adoption of AI in learning processes, such as data privacy, algorithmic biases, and academic integrity.

4. Literature Review

4.1. How AI is transforming higher educational landscape

Technology has become a pivotal instrument in addressing economic and social challenges. Emergencies in technology have altered many areas in the learning and teaching sphere. Pervasive education inventions provide many ways for people to access Education anywhere and anytime, thus

decreasing the time needed to study a course at the university level. Moreover, it heightens the degree of Education and makes learning cost-effective. Artificial intelligence integration has shifted the situation further (Aithal and Aithal's ,2023). In traditional learning and teaching systems, the main focus was on gaining skills and addressing a problem. However, the advent of artificial Intelligence has shifted attention to using gleaned skills to assess, compare, interpret, and generate feedback.

AI-powered GPTs (Generative Pre-trained Transformers) have significantly transformed higher Education. AI-based GPTS are complex language models that produce top-tier human-like text, creating new teaching, research, and learning opportunities for learners and educators. The purpose of higher learning is gradually and swiftly changing in the wake of Artificial Intelligence as colleges seek to cope with the changes brought by AI-powered GPTs. Some of these adaptations will include developing new programs and course offerings that concentrate on machine learning, data science, and artificial Intelligence to prepare learners for professions in creating and using AI solutions (Aithal and Aithal's ,2023).

Moreover, colleges are using AI-powered solutions for research projects. Researchers can leverage these models to create large sums of data assessments. As a result, higher learning institutions can save their resources and the time involved in research with AI help. Apart from data analysis in research, AI-powered GPTs can assist researchers in discovering trends and links within data to derive invaluable insights, which might be impossible or hard via conventional study approaches. Furthermore, higher learning institutions are employing AI-powered GPTs in classrooms to offer learners a more individualized and involving learning experience. Besides, lecturers can use it to create lecture content, assessments, and assignments, tailoring the content to every student's needs and learning preferences.

4.2. AI and Teacher Career Development

Al-Zyoud (2020) analyses the effect of Artificial Intelligence on educators' career advancement. The author revealed that the benefits of using Artificial Intelligence in teacher career progression are mainly through enhanced on-site job training. Several companies worldwide, like IBM, use virtual reality to train workers during working hours. Using virtual reality, workers could see the knowledge that professional analysts back up and provide better investigative services such as rectification. Online tools are available with the help of artificial Intelligence, which allows teachers to share their experiences and learn from colleagues.

In addition, using Artificial Intelligence allows educators to learn practical strategies to help them rely on data-based decision-making. As a result, they can help their students perform better. For instance, using AI to analyze students' performance data and understand their strengths and weaknesses would help teachers use appropriate teaching methodologies. In addition, artificial intelligence insights help teachers understand how efficient teaching is and the nectar of going back in a cycle to perfect their performance. By relying upon AI's insights, one can improve teaching methods and achieve better results in the individual performance of learners.

Furthermore, teachers can rely on AI-based solutions to have numerous learning materials that help educate the learners per a specific set of interests and skills. For instance, AI algorithms can guide instructional materials that are appropriate to a learner and suggest learning resources depending on learners' advancement and the rate at which they grasp concepts. Providing access to AI-based tools ensures teachers have compelling and engaging materials created according to their learners' needs. Therefore, it fosters more effective and fun learning for the tutors and learners.

In addition, artificial intelligence is much more personalized in terms of the educator's career development. These tools can analyze the weaknesses and strengths of a teacher, knowing that if they have any lack in performance or skills acquisition, theories (Al-Zyoud,2020) Via data scrutiny, AI-powered solutions identify the skills that a particular teacher can improve to tailor their content in a relevant manner. Using AI tools to assess teachers' capabilities and areas of improvement fosters a culture of ongoing learning, encouraging teachers to stay current with evolving instructional strategies and students' preferences. In essence, AI helps educators to hone their skills and offer more enhanced and quality services to learners.

Lastly, Artificial Intelligence helps teachers automate administrative tasks. AI lessons the problem of routine administrative responsibilities, creating assessments, keeping student records, coordinating class timetables, classroom arrangement, lesson planning, exam and assignment grading, and training student attendance. For example, AI-powered systems can help teachers determine the best ways of arranging students in the classroom, helping them save time for research or consultation. Overall, AI helps streamline teachers' work by lifting some burdens and giving them ample time to commit to other areas to which they need to provide much attention, such as engaging or interacting with learners.

4.3. Impact of Artificial Intelligence on Learners' Motivation

Learner motivation is crucial to effective learning outcomes, particularly in engineering. The authors suggest that the most successful teaching techniques that motivate students include using personalized learning, setting clear goals, positive reinforcement, and Artificial Intelligence (Neji et al., 2023). Artificial Intelligence has been involved in many fields for a long time, including Virtual Reality, Automated Essay Scoring, Augmented Reality Intelligent Tutoring Systems, Educational Data Mining, Intelligent learning management Systems, Computer-Based Teaching, etc. Motivation of learners using Artificial Intelligence is a rising and intriguing instructional module in Education. First, AI offers educators personalized instructions that inspire students (Neji et al.,2023). Moreover, it ensures that the learning processes are engagement-worthy since learners' interests are required to be aroused.

Neji et al. (2023) note that research has suggested positive results through artificial Intelligence to instill motivation among learners in different fields, including engineering courses. In the other study, (Cho et al., 2020), Artificial Intelligence allows personalized learning, predicting student performance, and intelligent teaching systems that recognize plagiarism. This use of AI helps to improve opportunities and create better learning experiences for students. Additionally, AI can provide adaptive feedback and tailored content to learners. In addition, it enables teachers to understand students' performance data and predict their future performances. However, the authors have pointed out ethical issues of AI in teaching environments, including algorithmic biases and data privacy concerns (Neji et al., 2023). Neji et al. (2023) suggest that future studies should consider AI integration in learning practices as a new field where more studies must be done. The study will present an ethical solution to this dilemma and provide a specific method by which AI can be applied in the traditional educational setting.

Using artificial Intelligence through gamification makes it active and allows learners to have fun (Alsawaier,2018). Educators, with the help of AI, can elaborate on the initial goals of the course and create a more exciting atmosphere by implementing game mechanics (Borrás-Gené et al., 2019). Using games in learning offers an immersive learning outcome for learners. Game facets keep learners hooked to accomplishing the milestones predefined by the educator. Moreover, they make Education feel more like a game than work, making learners more stirred to pursue their goals (Demkah & Bhargava, 2019).

Moreover, gamification improves the educational experience by assessing user data. After students have achieved a certain height in the study process, educators can find data assessed by AI tools to set objectives for subsequent objectives. As a result, it encourages learners to continue learning and exploring games.

Games are an aspect of life that is gradually being adopted across various fields, such as health and Education (Kiraykova et al., 2014) and (Leony et al.,2015), In Education, for example, the main challenges are a need for more student motivation and dedication (Wang et al., 2018). Using AI-based games in learning can enhance motivation and improve performance and fun via engaging and fun learning activities (Klemke et al., 2018). By incorporating games into learning processes, learners can polish their knowledge and skills by dedicating much time to learning (Huang & Soman, 2013). Students' feelings and emotions play a vital role in the study process.

4.4. Effect of AI on International Higher Education Learners

International learners encounter many problems in foreign countries. These issues need to be overcome to improve international students' learning experience, and colleges often discuss using AI solutions to do so (Wang et al., 2023). By 2025, international scholars will rise to about eight million. Students studying in foreign countries pose different problems for colleges, like cultural deficits, language differences, and strangeness about the point systems used by alien nations. The issues are met by using advanced technologies, such as Artificial Intelligence, in universities to enhance international students' overall experiences.

Implementing Artificial Intelligence solutions within the educational domain can revive international learners' learning processes (Wang et al., 2023). Artificial intelligence's applicability in Education is becoming more and more applicable today. By implication, AI-based systems give scholars who teach internationally a better understanding of learners' responses to educational content and approaches to create a more committed scholarly community from various cultural backgrounds (Wang et al., 2023). In addition, AI-driven learning can be designed to produce the competencies demanded across other continents in learners. Some specific cases of artificial intelligence solutions in learning — predictive analytics, AI Chabot, personalized learning, and adaptive testing- help enhance the process of studying for international students.

Furthermore, Artificial Intelligence can improve the quality and worth of Education by applying sophisticated computing technologies such as intelligent virtual learning, personalized

education systems, and data forecasting technology (Wang et al., 2023). Nowadays, the learning administration area for international students is a critical domain that Artificial Intelligence affects. In addition, international trials have been conducted in different countries, from AI-powered MATHia and ACTIVE Math and Why2Atlas-type interactive learning areas to measure students' performance, refine teaching tools, and facilitate faster communication between instructors and foreign learners. Additionally, AI-powered engines, including Ecree, Grammarly, and PaperRater, are accessible for assessment recognition, plagiarism, recognizable proof, and composing upgrades that worldwide understudies can procure (Wang et al., 2023).

Artificial Intelligence tools such as Auto Tutor and Deep Tutter can facilitate customization and personalized information delivery (Wang et al., 2023). Consequently, they enhance the student's performance and increase rates of educational satisfaction for international students. In addition, the shift to virtual learning enabled Artificial Intelligence technologies to develop better teaching aids for teachers and transcend physical boundaries where international scholars benefited from AI-based language translators like Google Translate in their instructional contexts. Tsai (2019) surprisingly indicates that Google Translate has a gigantic positive impact in helping foreign learners with sophisticated vocabulary and limiting grammatical errors and spelling mistakes while learning English at Chinese universities. The learners are also satisfied with using Google Translate to perfect their English literacy (Tsai, 2019). Finally, gamification combined with 3D solutions and virtual reality may further enhance the effectiveness of instructional strategies for international students.

Numerous research studies highlight the advantages of artificial Intelligence for international scholars' learning experiences. For instance, Pokrivcakova (2019) suggests that AI-powered chatbots can enhance learners' learning experience by customizing learning material per students' abilities and unique needs. According to Weiguo (2015) and Sutton (2019), AI-powered writing and revision assistants like Turnitin and Pearson's Write-to-Learn help to promote academic integrity. However, Crowe et al. (2017) claim that AI-based applications can cause learners to use paper mill platforms, nurturing deceitful behaviors and compromising academic integrity. For non-English speaking international students, AI-based translator and study tools, dictation and voice recognition tools, and language study tools can be valuable assets (O'Neill, 2019). Pratama (2021) states that an AI-powered tool such as Grammarly or Google Translate enables international learners to write appealing essays. Similar AI systems like Ginger, Quillbot, and ProWritingAid can also impact

language study for foreign scholars, as per Erkan (2022), Tran (2022), and Nurmayanti and Suryadi (2023).

4.5. Classification of Educational AI

The impacts of artificial Intelligence on Education are classified into teacher, student, and guidance. According to Nguyen (2023), guidance Artificial Intelligence refers to artificial intelligence programs that help learners and educators in decision-making. These types of AI give data-driven advice and enhance access to learning opportunities. Moreover, they allow learners to decide which educational opportunities to hunt (Nguyen, 2023). However, not in the field of learning and teaching, guidance AI helps in improving educational experiences. For instance, via guidance in artificial intelligence, people can evaluate data to link vulnerable learners with learning opportunities in efforts to close the Education or literacy gap. Some of the guidance AI are explained below.

Artificial Intelligence plays a critical role in teacher recommendation systems. According to (Nguyen, 2023), AI is an educator recommendation system for online educators and learners. In virtual learning, recommendation systems are used to match learners and educators. Learners and educators must be appropriately matched to avoid a lot of arrangements and social misunderstandings. Ratings and reviews from previous learners can be unreliable and biased, making it an ineffective way of recommending educators for students (Nguyen, 2023). To enhance the recommendation process, Artificial Intelligence can assess data from students' and teachers' histories and determine which students and educators are compatible. Moreover, AI determines at-risk learners and suggests measures to help them.

On the other hand, student AI is a mixture of educational principles and AI applications that enhance quality by making Education more effective and engaging. Some of the learning artificial intelligence are learning analytics, intelligent tutoring systems, and game-based learning. These types of AI concentrate on the learner side of Education and seek to assist learners in comprehending, upholding, and using the acquired skills they are offered in the classroom. Observing educational precepts and related research is crucial for Artificial Intelligence to be more successful in enhancing learning.

The class category of AI is teacher AI, which helps educators instruct students. AI is a supplementary instrument to the educator by expanding the instructor's approaches or increasing the tutor's time to deliver content. One example of these types of AI is automated grading AI such as

essay autograder. Some AI technologies have been designed specifically to aid teachers in grading essays written by learners. These models detect trends from past human-scored essays to identify which essays are of superior quality. Even though an AI model cannot truly comprehend why an essay is poor or excellent and may not capture the complexities and context, it can utilize statistical trends perceived in past high-scoring papers to guess the correct scores (Nguyen, 2023). Furthermore, essay-grading AI can help educators lessen the time required for manual grading and physical interaction with learners.

4.6. Potential of AI tools in educational evaluation and measurement

Owan et al. (2023) explore how AI can be used to offer evaluation services, including giving learners personalized responses and helping educators adapt their instructional approaches to satisfy the distinct needs of every learner. The recent comfort of data access and machine intelligence complexity has caused artificial Intelligence to redefine how people teach, learn, and assess their performances.

The application of AI in academic assessment can also be aided by personalized learning (Owan et al., 2023). Education through artificial Intelligence permits educators to be more efficacious and enhances learner engagement. There are chances to probe AI to prepare personal learning plans for learners with different strengths and weaknesses. Furthermore, AI can tailor the educational necessities of students by using the website data, including assignments and tests, to provide them with personalized feedback. Learners can use the main orientation feedback and work at their rhythm, strengthening their weak points. Knewton and DreamBox AI platforms adjust instructional plans to individual weaknesses and develop opportunities based on data analysis. Such systems will use the data to produce customized learning paths with particular objectives.

ITS (Intelligent Tutoring Systems) can also be deemed an AI application for educational inspection. Through AI-based tutoring applications, trainees receive individualized help and precise feedback (Owan et al., 2023). Learning management systems can be customized to learners' reading styles and offer individual assistance and suitable advice to help them achieve high performance. Moreover, the technologies motivate trainees to continue learning because they can immediately see the feedback they receive. For instance, ALEKS and Carnegie's Leaning's Artificial Intelligence math tutoring solution provide immediate feedback and highly customized learning paths based on student limitations and strengths (Owan et al., 2023). The system adjusts learners' learning tempo and

provides interesting teaching content and exercises. They need to use intelligent tutoring, allowing the teachers to offer individual instruction to students, monitor their advancement, and identify areas requiring more effort.

In Education, Artificial Intelligence plays a phenomenal role, especially in automated grading systems. Machine grading has relieved teachers of this responsibility through a more subjective and effective method of assessing learners' work (Owan et al., 2023). Artificial Intelligence can also mark quizzes, assignments, and essays while giving students feedback. Its ability to evaluate scored written work, identify plagiarism cases, and mark answers have changed traditional grading practices.

Additionally, artificial Intelligence is applied in natural language processing (NLP) and predictive analytics. However, Artificial Intelligence algorithms can determine learners' engagement, attendance rate, and performance metrics to predict future outcomes. With this, the teacher will be able to make use of these facts so that they can know who is lagging. For instance, the University of Florida uses predictive analytics to identify at-risk learners who need additional support (Owan et al., 2023). In addition, NLP-backed AI tools assist students in exploring languages and intensify their writing capacities by guiding spelling, grammar, and punctuation. Trainees can use these resources to practice critical thinking by evaluating their preferences.

From the teacher's side, these tools allow them to investigate and analyze natural language processing data such as learners' discourse, essays, or social media posts to understand how best they can adapt their instructional approaches. For instance, Grammarly's NLP software provides live feedback on learner performance regarding spelling and grammatical structure (Owan et al., 2023). All these services allow the learners to enhance their writing abilities and increase the quality of their written works.

Apart from these, we have other applications of AI in educational assessment and evaluation, such as AES, which must be aided by CBT software. NLP features used by AES platforms make them capable of assessing and rating written works, including essays. With the help of AES software, a teacher can determine feedback on an assignment without doing it manually and losing valuable time. Grammarly and Turnitin are good examples of AES platforms. Alternatively, computer-based platforms enable teachers to offer online evaluations, including actual or face quizzes or multiple-choice questions (Owan et al., 2023). Teachers utilize CBT software to evaluate learners' understanding and give them immediate comments. Some examples of CBT are JAMB CBT, ExamSoft, ProProfs, Questionmark, and UNICAL Postgraduate e-exams.

4.7. Types of Artificial Intelligence

Artificial Intelligence can be grouped into logic-based, knowledge-based, and data-based AI (Ilkka, 2018). Data-based AI is known as machine learning (ML) and artificial neural networks. Nicolas Rashevksy was the first person to develop mathematical models of neural networks back in the early 30s. The models went viral when Rashevsky's student, Walter Pitts, in 1942 deciphered biological neural webs as links of logical gates. When Pitts and McCulloch published these concepts, Alan Turing demonstrated that proper logic could be computerized. Also, the first digital computers were being designed during this period. The brain started to be perceived as a computer, while computers were called electronic brains. This crisscrossing metaphor became a more influential force, sustaining research and mental science in institutional information synthesis, and currently impacts different sectors, with Education being no exception.

Modern-day artificial neural intelligence is based on neural web models resulting from neurobiology. In 1958, Frank Rosenblatt made a critical contribution that indicated that learning in biological neural webs can be designed as a progressive change in network intertwining (Ilkka, 2018). The key distinction with current neural artificial intelligence systems is that linking is done via machines nearly a trillion times faster than the IBM machine that Rosenblatt utilized for his trials.

4.8. Artificial Intelligence and Student Skills Development

The utilization of artificial Intelligence in learning and teaching has become a customary subject of debate in the current educational setup (Shiohira, 2021). Investigators and practitioners have initiated artificial Intelligence, which is associated with numerous intransient problems in learning, like differentiated learning, teaching quality, and learning in emergency environments or eviction. According to the Beijing Consensus, Artificial Intelligence can empower Education in various ways (Shiohira, 2021). The proposed target areas include artificial Intelligence to aid and assess, AI to support interdisciplinary competencies and potentials, and AI to achieve adaptive learning practices. The Beijing Consensus concentrates on educators as AI users and AI as an instrument to encourage a more effective and comprehensive learning and teaching tool.

When appropriately entrenched into proper and firm values and ethical principles, Artificial Intelligence can empower learning and teaching, given the large volume of information that higher learning institutions have access to (Shiohira, 2021). For example, higher learning institutions use

AI for planning, marking, and instruction. AI technologies like the Learning Referral Network have been developed to offer customized curation of digital repositories. Some chatbots, like the Digital Intelligence Virtual Assistant, have primarily been designed at higher learning institutions to attend to learners' quizzes and lessen demands on teachers (UNESCO, 2019). AI-powered Technologies such as Open Source Physics and LabXchange give learning experiences to learners in computer design and virtual experimentations, thus saving educators' effort and time in simulating and demonstrating digital lessons.

In collaboration with Ericsson, UNESCO designed Artificial Intelligence for young people to acquire AI skills. The project entails an online fountain of resources to mentor young adults about artificial Intelligence- its operation, usage, and impacts on humankind (Shiohira, 2021). The source of resources is specially crafted to aid educators and syllabus developers in upgrading their skills and potential by incorporating artificial Intelligence into school syllabi. For example, South Africa's integration of AI platforms into learning processes has helped the country lessen teachers' workload because students can sign in from wherever they are and utilize campus materials. Universiti Tun Hussein Onn is another Malaysian university creating a chatbot to offer learners instruction and guidance even when the school is physically closed (Shiohira, 2021). Moreover, predictive platforms such as the one employed by Change Dyslexia are utilized to identify learning hardships among students based on observed phenomena like eye tracing and reading speed. Furthermore, AI-powered personal assistants like Google Calendar and X.ai execute administrative roles like planning and rescheduling lecturers and meetings within tertiary education institutions.

Additionally, (Shiohira, 2021). suggests that artificial Intelligence can help arrange administrative demands such as student application and admission, budgeting, Human Resource associated challenges for teachers, course management, procurement services, and facility and cost management. Besides its role as plagiarism detectors, AI can be used to develop intelligent classrooms through which teachers can easily manage learners' behaviors. The integrity of Education has become a critical problem in the virtual world today. With the use of Artificial Intelligence, it becomes possible to identify patterns related to similarity and plagiarism, decreasing cases of cheating among students.

Artificial intelligence tools can also identify the writing genres and content by using advanced algorithms to ensure that assignments align with every learner's level of comprehension. The tools can investigate and distinguish between human-like and machine-generated texts.

Monitoring student behavior and engagement helps educators devise instructional strategies that are more applicable to Gen Z learners. Lastly, (Shiohira, 2021). suggests that Artificial Intelligence can be applied to decrease educators' administrative workload by assisting them with feedback and grading on students' personal written work.

4.9. Prospects and Challenges in Using AI in Higher Education

Alotaibi and Alshehri (2023) discuss the challenges of integrating AI-based learning in tertiary institutions in the case of Saudi Arabia, underlining the need for educators to seek novel skills to successfully utilize Artificial Intelligence pedagogically. In 2016, Saudi Arabia's Prince Mohammed bin Salman inaugurated an ambitious countrywide initiative, Saudi Vision 2030. This plan emphasized Education as a critical ingredient in the Kingdom's advancement. To realize this vision, Saudi universities are rapidly adopting new technologies to transform students' and educators' experiences and hone their skills. In addition, universities are using AI to acquire educational advice. Intelligent Academic Advising is an AI invention aiming to automate academic advising obligations. Saudi Arabian Universities acknowledge the significance of AI and are willing to integrate it into their processes, such as evaluating learners and giving them feedback in the place of educators. According to (Alotaibi & Alshehri, 2023), AI resources such as intelligent reporting systems produce customized help and longstanding educational scheduling with the help of complicated quizzes, algorithms, and resource-intensive databases.

Nevertheless, Alotaibi and Alshehri (2023) claim challenges related to executing AI-powered learning in the Kingdom's higher learning setting. The authors propose that educators hunt for new skills to successfully implement artificial Intelligence in their instructional methods. The teachers in Saudi Arabia need to master the tools and comprehend how they are used when adopting AI solutions in higher learning institutions. Partnership between AI designers and educators is paramount to ensure that the developed AI technologies are sustainable and aligned with real-world settings (Alotaibi & Alshehri, 2023). Furthermore, there is a need to tackle fundamental technical infrastructure disparity and budgetary allocations in Saudi Arabia for hardware and software resources and constant training for effective implementation of AI into educational systems.

4.10. Factors Affecting Students' Intention to Adopt AI-Based Robots

Although the services of teachers are still needed, the widespread adoption of AI in higher learning institutions will reduce the roles of educators. AlGerafi et al. (2023) explore Chinese university learners' intention to adopt AI-powered robots for learning motives. The findings of AlGerafi's (2023) study disclose that learners are receptive to adopting AI-enabled roots in learning. The study outcomes show that university students are confident in improving their skills and staying current with the modern creations of the AI world (AlGerafi et al., 2023). Consequently, higher learning institutions should install a knowledge control warehouse containing all the information regarding learners' educational needs, including Intelligence.

In addition, robots powered by artificial Intelligence provide an impressive learning environment for tutors and learners that helps them become deeply familiar with topics. Using AI robots, learners can develop more skills without being the center of attention in physical class or facing disparagement from peers when making mistakes (AlGerafi et al., 2023). Robots based on artificial Intelligence create a friendly environment for learners, making them feel slightly relaxed even when learning the most challenging subjects.

Moreover, AlGerafi et al. (2023) found that AI-driven robots are highly accepted in learners' domain and motivate them to use these artifacts for learning purposes. The authors suggest that higher education institutions focus on further investigations of implementing AI robots in learning and ensure their compatibility with school requirements and students' preferences. Besides, the authors also recognize that AI-enabled robots (AlGerafi et al., 2023) can produce quality and desirable results. In this specialized case, the AI applications selected by universities must comply with university and learner requirements as it is possible to provide better user experiences. The authors argue that AI technologies must be simplistic and easy to understand for student use. In addition, students should know about the capabilities of AI-powered robots to ensure that they accept such technologies.

AlGerafi's (2023) research shows that AI-driven robotic applications would have even the potential to revolutionize Education in due course. The utilization of AI-powered robots in learning motivates and attracts the interest of many students. The coming years encompass robots and AI, making it crucial for higher learning institutions to embrace these cutting-edge inventions to transform pedagogical approaches. The use of robots guarantees improved precision and efficiency in learning experiences and students' motivation and performance.

4.11. Impact of AI on Academic Libraries

In the education sector, libraries have traditionally played a role by offering a wealth of materials for educational institutions and serving as a learning space for both learners and educators. Today's Artificial Intelligence technologies in Education can change academic libraries tremendously (Wang et al., 2023). AI can affect numerous facets of libraries, including personalization, recommendation and search systems, data and text mining, and analytics. These applications could improve user experience and the entire functionality of library spaces. Even though there is some shyness in the adoption of AI in the learning environment, Wang et al. (2023) propose that school librarians are open to incorporating AI into library functions.

Another familiar example of Artificial Intelligence usage in libraries is chatbots. Wang et al. (2023) explain the profits of chatbots, like consistency, 24/7 accessibility, and patience in responding to questions. In addition, artificial Intelligence can provide customized library help and tailored services to library users, including staff, teachers, and learners. AI could also help library users locate relevant materials in the shortest time and effectively while simultaneously evaluating the user's attitudes and conduct to retrieve the most appropriate resources for them (Wang et al., 2023). Artificial Intelligence's capacity to revolutionize libraries goes past librarian help; it can maximize the library's routine functions. By automating routine activities like shelving, cataloging, and sorting library materials, library patrons can commit their time to outreach, study, and programming, among other non-routine tasks. Furthermore, AI could digitize library resources, enhancing precision and pace in material recovery efforts. As a result, the time and resources needed to do manual tasks are reduced.

4.12. The use of AI in education personalization

The current trend of personalization in learning revolutionization demands an appropriate tool to assess behavioral patterns according to data to identify unique needs for better learner performance (Bhutoria, 2022). Artificial Intelligence and Big Data, the colossus of today's technological developments, effectively extract valuable insights from sophisticated assorted databases to enhance decision-making via prescriptive, diagnostic, and predictive properties.

Bhutoria (2022) states that learning can always be different for all students in the conventional setup. In the traditional education landscape, educators hold an instrumental position

and guide the whole set of learners based on the syllabus. Here, the teacher's skills are the fulcrum sustaining the entire system. However, in reality, some learners lack self-motivation in learning. Thus, it is crucial to evaluate the requirements of a specific learner or a group of them and offer to nurture a collaborative system where the student's learning needs are the focal point. This is made possible via AI (personalized learning) because it provides learners with a more engaging learning experience and lessens chances of dropout or poor academic performance.

The dire desire to integrate personal factors in the learning process introduces AI as a foundational element of the new generation system of Education (Bhutoria, 2022). Artificial Intelligence, compounded by available technological inventions in Education, is directed to methodically revolutionize and remodel some essential aspects of the education system to accommodate student-specific requirements. According to a study by Liang and Hainan (2019), literature across China, India, and the United States reveals that AI can widely record and monitor diverse learning features of students and propose pertinent instructional and learning approaches based on a learner's specific learning features. The revolution ensures that learners are kept in the loop. Instead of concentrating solely on scores as learning performance, AI-based applications can include the finest details like level of focus, engagement, and classroom participation. As a result, there is a paradigm change as the system leans towards customization of learning processes. Identifying and integrating diverse learning genres (auditory, reading, writing, visual), habits, and students' learning speeds helps AI-based solutions suggest customized learning paths.

However, personalized learning has its unique challenges and limitations. The shift from the traditional setting to a customized form of learning is the building block to designing a better education system in the future. However, AI is also anticipated to pose a new set of problems. AI-based learning is self-motivated (Bhutoria, 2022). Regardless of the wealth of sources of learning materials available to learners by AI, the motivation to explore these materials still needs to be determined. As a result, teachers are necessary to encourage learners to study. However, their role is very different in this context compared to the traditional learning framework.

4.13. Ethical Implications of AI Technologies in Education

Although Artificial Intelligence can dramatically improve Education, it poses various limitations and concerns, such as bias, privacy, and the possibility of AI increasing the literacy gap or educational disparities (Wang et al., 2023). Moreover, it is essential to acknowledge that artificial

Intelligence is not an alternative for human teachers but an instrument used to improve and supplement the teaching profession. Other technological solutions used in Education have limitations, too. For instance, customized learning experiences can lead to security and privacy issues because AI leverages data to tailor Education, which may necessitate gathering learners' data that is subject to regulations in different countries. Other limits include cultural barriers to how individuals share their information, and AI may undermine it.

In addition, the use of adaptive testing for students poses threats. This is particularly evident among the overseas students. For instance, using such algorithms to capture quiz complexity may need to be revised because it does not precisely reflect a learner's language ability and capacity to understand more sophisticated words. This may lead to erroneous results of the tests that do not fully reveal learner knowledge and possibilities. Ethical concerns can also affect learners through predictive analytics in learning (Wang et al., 2023). For example, identifying learners who are just about dropping out of school or struggling with educational challenges requires collecting data that may only apply to some learners, particularly those studying abroad. Because of this, the projections concerning the target learners are often faulty or unsatisfactory. Besides, the data used for predictions can be accessed under distinct privacy authorities or laws in most countries.

However, blending AI-powered technologies into the learning process leads to moral issues like language barriers and cultural differences, which meddle with the exactness and efficacy of the data. For instance, students might require different services or have customized requirements that an AI could not handle. As a result, learners tend to value feedback information less from AI-powered software than from their teachers.

5. Research Method

A qualitative approach was used for the study to gather the views of educators and learners about the use of AI for learning activities at Northern Border University.

5.1. Research Design

This investigation used a qualitative study approach to determine students' perceptions of using and implementing artificial intelligence technologies in learning processes. The study was conducted via face-to-face, semi-structured interviews with students and teachers from Northern Border University. The interviews were conducted to facilitate two-way communication and open-

ended responses and to reveal in-depth viewpoints on how artificial Intelligence affects students' and educators' experiences.

5.2. Participant and Participant Recruitment

This study involved 200 participants, including students and teachers from Northern Border University. A purposive sampling approach was employed to choose participants, and the interviews were carried out in a month. The research team recruited this study's participants via a university sports club and volunteers. The participation invitation letter was also circulated via students' emails and to staff members. Semi-structured interviews were used because of lived experiences and increased engagement with participants. Interviews were conducted until the researchers achieved data saturation.

5.3. Data Gathering Technique

Respondents were questioned through online questionnaires, which provided the data for this assessment. The questionnaire aimed to elicit students' perceptions regarding AI in Education, examples of applied AI programs or gadgets used for learning, some experiences that have followed specific use, and understand whether such experiences are positive or negative about performance. In addition, where there may be fears, particularly when attaining success among these higher institutions while using them. The participants were taught to fill out the questionnaire correctly, and the researchers asked for informed consent before distributing the questionnaires.

5.4. Data Assessment Procedure

This study employed a thematic evaluation approach to analyze the collected data and elucidate the underlying themes, trends, and categories. Respondents' responses to open-ended questions were systematically examined, ranked, and coded to discern recurring concepts, perceptions, and overarching themes. The coders adopted an iterative coding process, whereby initial codes were iteratively refined and classified into broader concepts and subtopics, highlighting dichotomies and similarities inherent in the data collection responses. Through this iterative coding process, the richness and complexity of the data were systematically explored, allowing for a nuanced understanding of the underlying patterns and trends. Furthermore, the collected data underwent manual scrutiny to identify recurrent themes that emerged across respondents' responses. This

process involved meticulously examining the coded data to identify patterns, connections, and associations between themes and subthemes. By scrutinizing the data manually, the researchers uncovered deeper insights and nuances that may have been overlooked through automated or quantitative analysis alone.

6. Research Outcomes

In the semi-structured interviews conducted with trainees at Northern Border University, a predominant sentiment emerged regarding the profound impact of AI-based mechanisms on their educational performance. This finding resonates with previous research by Aithal and Aithal (2023), which concluded that Artificial Intelligence has significantly transformed the educational landscape, mainly through functionalities such as text generation. Over 50 percent of the participants expressed appreciation for AI-powered solutions, including intelligent tutoring portals, virtual assistants, and text-generation tools, which they credited with reinforcing their understanding of complex concepts and enhancing learning outcomes, as suggested by Neji et al. (2023).

Furthermore, participants highlighted the potential of personalized learning experiences facilitated by AI, which can adapt to individual learners' demands, a sentiment consistent with Aithal and Aithal (2023). Additionally, AI was identified as a facilitator of collaboration and engagement in learning, enabling trainees and instructors to communicate more effectively with peers and customize learners' experiences, as noted in previous research by Neji et al. (2023).

However, the data analysis revealed a range of experiences with AI among participants, with some benefiting from AI tools in their studies while others encountered challenges. This aligns with the findings of Alotaibi and Alshehri (2023), which highlighted trainees' struggles with applying AI tools in real-world settings due to sustainability and realism issues. Examples of the efficacy of AI tools included increased productivity, better time management, and improved educational outcomes. At the same time, challenges such as technical glitches, limited personalization options, and concerns about data protection and confidentiality were also reported.

Despite these challenges, participants unanimously agreed that AI helped them improve their academic achievements, enhancing skills such as problem-solving, critical thinking, and comprehension of learning material, consistent with the findings of Owan's (2023) AI solutions were perceived as inspiring and motivating, encouraging rapid and convenient knowledge acquisition, thus heightening education standards and efficacy across various dimensions.

Nevertheless, participants expressed various concerns and uncertainties about integrating AI solutions in learning, including potential over-reliance on AI, algorithmic bias, and data insecurity, consistent with previous research by Neji et al. (2023). The need for data regulations and efforts to obtain informed consent for AI usage in learning environments was underscored, along with the importance of addressing algorithmic prejudice and discrimination in AI tools.

Lastly, the semi-structured interviews also revealed that lecturers consider AI technologies helpful in fine-tuning their pedagogical approaches Zyoud's (2020).AI tools were reported to enhance teaching through personalized learning, resulting in reduced workloads, increased efficiency, and higher levels of student engagement. However, instructors expressed a need for more expertise in using AI tools and broader access to AI repositories to leverage their full potential in instruction.

7. Discussion

Analyzing teachers' and students' opinions regarding AI's impact on academic matters in Saudi Arabian higher learning institutions sheds light on the implications for future Education. Artificial Intelligence has garnered increasing attention and significance in the educational sector, with numerous tertiary institutions adopting AI-based tools to facilitate effective learning and teaching processes. Echoing existing literature, this study underscores the transformative potential of Artificial Intelligence in learning and instruction.

Participants in this study emphasized the pivotal role of AI technologies in enhancing efficiency and productivity within educational settings. These findings align with previous research indicating that Artificial Intelligence can effectively personalize learning experiences to accommodate individual preferences and learning paces. Moreover, the study suggests that AI holds promise in positively influencing learners' performance by fostering critical thinking and problem-solving skills, reinforcing past findings on the benefits of AI-driven tools in enhancing student engagement, motivation, and academic outcomes.

However, despite AI's evident advantages in learning and teaching, the study uncovers various barriers and challenges associated with its implementation. In contrast to prior literature, respondents expressed concerns regarding data breaches, security infringements, and limited personalization options, highlighting the urgent need to address technical issues and establish data regulations to instill user confidence in AI-based solutions. Additionally, worries about algorithmic biases and the

potential for AI addiction underscore the importance of implementing deliberate measures and policies to mitigate risks and ensure equitable access to technology-enhanced learning opportunities.

These findings contribute to the evolving discourse on AI in Education, emphasizing the necessity of balancing the potential benefits of AI with the ethical and practical challenges it presents. Moving forward, educational stakeholders must collaborate to address these challenges through targeted interventions, technical solutions, and policy initiatives aimed at fostering responsible and inclusive AI integration in educational settings. By doing so, we can harness the transformative power of AI to achieve efficient pedagogical practices and learning outcomes across diverse educational contexts while mitigating potential risks and disparities.

8. Potential Study Limitations

While this study has provided valuable insights into the perspectives of learners and educators regarding the role of AI in Education, several areas for improvement exist. The reliance on online questionnaires for data collection may have limited the depth and quality of responses, as online surveys often fail to capture nuanced insights compared to face-to-face interviews or focus group discussions. Consequently, crucial facets of respondents' perceptions and experiences may have yet to be thoroughly investigated or comprehended.

Additionally, the study's sample group, drawn from students and educators at Northern Border University using a purposive sampling strategy, may introduce biases and restrict the generalizability of results. A larger sample size beyond the 200 respondents in this study could have facilitated data saturation and a more inclusive comprehension of the investigated topic.

Moreover, the participants assessed in this research may limit the applicability of results to diverse educational and cultural contexts. Institutional disparities and cultural differences may influence how individuals perceive and experience AI in learning, suggesting the need for broader representation in future studies.

Addressing these potential limitations could be achieved by adopting mixed research approaches. Combining qualitative and quantitative methods, such as focus group discussions and face-to-face interviews alongside online questionnaires, would enable researchers to triangulate results and gain a more comprehensive understanding of the study's subject matter.

Furthermore, employing a more inclusive sampling technique, such as stratified sampling across multiple higher-learning institutions, would ensure representation from various institutional,

academic, and demographic settings. This approach would enhance the study's ability to capture diverse perspectives and experiences on adopting AI in Education.

Additionally, cross-cultural comparisons could shed light on how cultural factors influence attitudes toward AI technologies in learning and teaching. By exploring consistent patterns and cultural differences in educators' and learners' attitudes, researchers can better understand the complexities of AI integration in the education sector and tailor interventions accordingly.

9. Conclusion

This study delves into the influence of AI-powered tools on academic progress, explicitly focusing on students and teachers from Northern Border University in the Kingdom of Saudi Arabia (KSA). Employing a qualitative study approach, the research aims to analyze the impact of artificial intelligence applications on learning and teaching experiences within this context. The findings of this research suggest that AI holds significant potential to enhance academic performance, efficacy, and productivity in educational settings despite the challenges associated with algorithmic biases and ethical implications. While AI-based tools have shown promise in improving learning outcomes and streamlining teaching processes, issues such as algorithmic biases and ethical considerations underscore the need for legal measures to address these challenges and ensure the seamless integration of AI in Education. However, it is essential to note that this investigation has limitations. The small sample size and sampling technique utilized in the study may limit the generalizability of its findings. Recommendations include employing mixed-method approaches and utilizing a more extensive and culturally diverse sample group to address this limitation and enhance the robustness of future research. By incorporating diverse perspectives and methodologies, future studies can intensify the generalizability of study outcomes and provide a more comprehensive understanding of the impact of AI in Education across different contexts.

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