Critical Analysis of the Rationality of Using Artificial Intelligence in Academic Studies

By:

Dr. Fatimah Sayer Alharbi

Assistant Professor in Mental Health Psychology,
Princess Nourah bint Abdulrahman University,
Saudia Arabia, Riyadh

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Abstract:

The present research is dedicated towards the exploration of the rationality associated with Artificial Intelligence (AI) towards academic studies. For addressing the research problems in terms of investigating the rationality associated with AI in academic studies, the current study is planning to deploy a primary method namely a semi-structured interview which has recruited 7 teachers as well as professors who are offering educational services in the educational institutions of Saudi Arabia.

Findings of the current study have helped in understanding both the positive as well as negative implications of using AI for educational purposes. The findings retrieve that Ai as an educational tool is highly supportive of providing the students with smart and innovative teaching assistance which is based on the student-based specifications as well as educational needs. However, the suggestions provided by the AI are also less appropriate for the educational development of the scholars as it leads a hindered cognitive development and enhancement in terms of critical thinking skills. Future studies can be organised in the direction of the longitudinal research time horizon along with the survey method which may help in covering a sample of large research participants.

Keywords: Artificial Intelligence, Education, Teaching

* **Dr. Fatimah Sayer Alharbi:** Assistant Professor in Mental Health Psychology, Princess Nourah bint Abdulrahman University, Saudia Arabia, Riyadh.

1: Introduction

Artificial Intelligence (AI) is used in every field to enhance process efficiency with the support of the technological revolution (Guan, Mou and Jiang, 2020). The benefits of the ongoing technological transformation, especially in innovation and knowledge, are accessible to all only with the support of AI (UNESCO, 2023). In the context of AI benefits for all, this dissertation is narrowed down in particular to the research setting of education. One of the developing disciplines in educational technology is artificial intelligence in education (AIEd), as per the findings by Zawacki-Richter *et al.* (2019). AI makes it feasible for teachers to design personalised lesson plans and tests that align with each student's individual strengths and weaknesses. Collaboration between AI and students in learning is advantageous for the engagement of the students with a positive outlook and motivation, which eventually improves academic results (Al-Abdullatif and Gameil, 2021.). The results of a systematic study of the academic literature demonstrate the widespread application of artificial intelligence across a variety of fields and disciplines, from profiling and prediction to assessment and evaluation to intelligent tutoring systems and individualised learning environments. It is due to the fact that AI encompasses a wide variety of tools and techniques, including, but not limited to, machine learning, robotics, Chatbots, data mining, and algorithms (Zawacki-Richter *et al.*, 2019).

According to UNESCO (2023), AI is one of the substantial initiatives towards the attainment of the Sustainable Development Goal (SDG) 4 of quality education. AI supports the attainment of critical educational challenges by helping to introduce innovative teaching and learning methods with technological advancements. The fundamental values of inclusion and equity govern AI use in educational contexts. Thus, UNESCO is dedicated to assisting Member States in maximising the potential of AI technologies for fulfilling the Education 2030 Agenda (UNESCO, 2023). The use of AI in education improves outcomes for students, faculty, and the institution as a whole. Software designed for students to employ in

their academic pursuits that are "learner-facing AI tool" and includes programmes like intelligent tutoring systems and personalised learning. However, systems designed for teachers help educators by automating routine processes like grading, performance evaluation for student feedback, and even detecting instances of academic misconduct. Chatbots, or "conversational agents" are helpful AI tools that lead to active, reflective, and thinking student-centred learning and education in physical and virtual education (Zawacki-Richter *et al*., 2019). According to Chen *et al*. (2020), AI usage has significantly evolved and advanced for academic purposes in the educational sector. In the beginning, computer and computer-related technologies were used in academics and education. Later, intelligent education systems that were web-based and online were developed, and finally, humanoid robots and web-based chatbots are currently used to carry out the tasks and duties of instructors either alone or in collaboration with instructors (Chen *et al*., 2020)

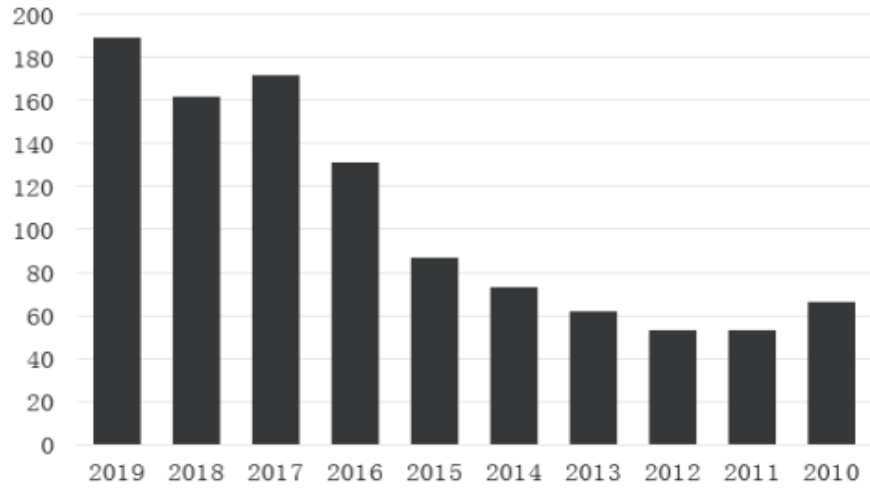

Figure 1: Sources with AI and Education Keyword
Source: (Chen *et al*., 2020)

Artificial Intelligence (AI) systems and algorithms are becoming more and more popular in education. According to data gathered from the Web of Science and Google Scholar, a significant

number of scholarly publications on "AI" and "Education" have been published since 2010, as shown in Figure 1. Intelligent education, cutting-edge virtual learning, data analysis, and prediction are all examples of AI-aided education that have contributed to timely, individualised training and learning requirements (Chen *et al*., 2020). AI is the key to solving the challenge of educational agents and individualised teaching (Guan, Mou and Jiang, 2020). In relation to AI in education, this research study aims to critically analyse the rationality of using artificial intelligence in academic studies. In order to address aim This research study addresses primary objectives (1) to examine the need for a technological revolution in education for academic studies; (2) to application and usefulness of AI in academic studies; (3) challenges in using AI in academic studies along with solutions /measures for overcome challenges.

2: Background Literature

Innovation has revolutionalised educational settings by changing the methods of teaching and learning. The recent developments in artificial development have led to its inclusion in educational settings for making effective changes in the core designs of academic institutions. Artificial Intelligence (AI) is defined as the instruments and tools such as the internet, search engines, applications, and smartphones that are used around campuses. The use of AI in academics is helpful in motivating learners and teachers to be engaged in learning and teaching processes at a higher level. The interaction between humans and AI is also regarded as a turning point for helping students to learn and memorise learning materials in an efficient manner (Fahimirad and Kotamjani, 2018). On the other hand, Tanveer, Hassan and Bhaumik (2020) defined AI as machines that simulate human intelligence and are programmed to think and perform like humans. AI is also applied to educational resources to improve the skills and competencies of teachers and also gives them freedom and time to adapt to AI to drive students' performance. It has allowed to development of tutoring programmes that help in customising and personalising education and improving schooling for students. By

promoting customisation and personalisation, AI has promoted interactive learning by allowing students to choose when and where they want to study and learn.

In support of the above findings learning and exploring AI has become a part of the academic curriculum and as computers and Television were once viewed as game changers in education, AI also has the potential to improve access to information without transforming the core of educational practices. The strategic value of AI has been observed in academic studies by playing the role of an effective learning tool that lessens the burden of students and teachers. It also offers an effective learning experience to students. In addition, the current reforms in education, such as gamification, digitalisation of educational resources, and personalised learning experience, also offer several opportunities for AI applications and techniques in education (Zhai *et al.,* 2021). However, the findings of the research by Barakina *et al.* (2021) highlighted that AI cannot replace teachers and high-quality humanitarian education cannot be possible in the absence of teachers. In addition, a need for offline education was also expressed by the participants of the research, and Information and Communication Technologies (ICT) should be considered in the format of distance learning. The incorporation of AI in education should be considered as the tools designed just for the improvements in the quality of education rather than the total replacement of teachers.

Moreover, AI has algorithmic powers that allow it to make predictions, decisions, diagnoses, and recommendations which have supported its inclusion in the educational community for supporting learning in diverse areas. AI is also used in academic studies for providing specialised supporting and raising knowledge-gap awareness that allows teachers to teach effectively through adaptive and personalised instructions. AI-empowered educational systems also allow institutions to evaluate classroom dynamics and engagement of students, which assists in the identification of weaker and at-risk students and promote timely intervention (Chen *et al.,* 2021). However, AI is also subjected to the loss of essential skills among

students due to heavy emphasis on technology, such as creativity and experience-based learning. Another challenge to the use of AI in education is algorithmic bias, as it extensively relies on data and if the data is unbalanced, AI can produce algorithms that are subjected to errors. Such conventional issues in the utilisation of AI in education present challenges for educational institutions and require to be addressed prior to the wider implementation in academic practices (Luan *et al.,* 2020). On the other hand, as one of the roles of AI is developing a tutoring system, it remains a challenge for many practitioners in the educational field to develop tutoring and adaptive learning systems. It requires extensive experience and knowledge of human tutors to make decisions and judgements about the AI systems for solving students' individual problems. Thus, in the implementation of AI for developing learning and tutoring systems, it is important to gather knowledge of human tutoring experiences for developing effective teaching systems for students to address their individual queries and promote higher academic performance (Hwang *et al.,* 2020).

3: Participants:

The sample chosen in this regard for the semi-structured interview includes teachers and professors of Saudi Arabia who are teaching in different universities, as insights into the usage of AI in studies and its impact on the students can be precisely provided by the teachers and professors only (Neuendorf, 2018). For this, a sample of 7 professors has been selected using the purposive sampling technique to select the sample unit who are able to provide the requisite information in the most effective manner. An interview schedule/questionnaire is prepared to carry out the interview with them emphasising exploring and examining the pattern regarding using AI tools and techniques by the students.

4: Measures:

The semi-structured questionnaire was constructed in this research study to collect detailed views of the professors. This style of questionnaire has given scope and opportunity to include new

questions to gain more clear information that led to dealing with ambiguities (Wilson, 2021). Questions were developed in an open-ended format so that participants could share their own perspectives and experiences about AI in education or academic learning/studies. Open-ended questions are not restricted to the Likert Options or Yes or No type questions, while intended focus is on encouraging participants to share opinions. A total of seven questions were asked of the participants to assess their knowledge about AI and its usage in academic studies or education. The sequence of questions asked to the participants, including general questions, to develop their interest in the interviewing process and then specific questions to gain data in the context of aim and objectives. In the same context, interview questions mainly covered AI's usefulness in academic learning, Student-AI Collaboration and challenges (reliability, integrity and accuracy of AI in learning) and lastly, rationale for adopting and preferring AI in education. The key questions were covered in the questionnaire are integrated questions related with the benefits, rationale and challenges, to test rationality of using AI.

5: Methods

5.1 Data-Collection Methods

In the research, to explore and examine the rationality of using Artificial intelligence in alchemic studies in the specific reference to Saudi Arabia, the deployment of a range of methodological aspects has been made. The study involves a focus on examining a particular set of behaviour, wherein, the choice of deploying qualitative method is examined most suitable, as it assists researchers in gaining understanding of the reason and ways in which such behaviours take place. Qualitative data has offered an important source of information to collect well-grounded data, explanation of the processes and rich descriptions in the identifiable local contexts (Sutton and Austin, 2015; Austin and Sutton, 2014). In this essence, the use of qualitative methods has helped in examining the feelings and thoughts of teachers and professors in the universities and schools of Saudi Arabia

regarding pros and cons of using artificial Intelligence in academic studies perspective within a social structure framework.

In support of this, the choice of interpretivism philosophy has been deployed which holds the assumption that the reality is socially constructed and can be examined subjectively. It helped in exploring and understanding different experiences of teachers with the use of the AI tools by students and teachers in academic studies. Moreover, the research inquiry has integrated an inductive approach and exploratory research design to collect a substantial range of data on the topic by searching for the common patterns gained through observations and developing explanations for them using a systematic procedure adherence (Alharahsheh and Pius, 2020).

Centred on the choice of qualitative method and interpretivism research philosophy, the choice of deploying primary and secondary methods of data collection has been made. Primary data is gathered in the research to obtain data from its original source directly, and for this, the choice of deploying a semi-structured interview method has been made, which allows direct and one-to-one interactions with the interviewees. In this regard, to conduct the semi-structured interview, the choice of a suitable sample unit has been made, which is a representative unit of a wider population. In the interview, open and detailed discussion with the participants is quite possible due to the small sample and thus, ample time for discussion in the interview is the advantage of gathering good and thorough information (Wilson, 2021). On the other hand, secondary data is gathered to synthesise the current base of knowledge and gain pivotal information on the topic. For this, the sources like books, peer-reviewed articles, journals, government reports and credible online evidence have been deployed. This whole process of inquiry has been based upon robust ethical principles to ensure morality.

5.2 Data-Analysis

All the gathered responses from the interview are analysed in the study using the thematic analysis technique, to seek common patterns and views across the datasets (Chapman, Hadfield and

Chapman, 2015). Thematic analysis in this study led to analysing detailed and qualitative data in the form of the common and different perspectives of the participants about the subject of AI in academic studies. The six steps of thematic analysis defined by Braun and Clarke (2021) aid in inferring key facts pertaining to the aim and objectives, including data familiarity, initial code generation, search and review of themes, defining themes and lastly, interpretation.

6: Results

6.1 Thematic Analysis

Theme 1: Usage of AI in Academic Learning

This theme was generated on the basis of responses received in the context of AI usage in academic learning. AI in education has been growing year on year, from computer systems to robots and Chabot software. The usage of AI in academics is relatively helpful for students, teachers, and entire educational institutions in terms of assuring quality education with efficiency. As analysed from the qualitative results, personalised and customised academic learning and intelligent education or tutoring with automation is possible with AI. In the view of Participant 1, "*Education is not limited to the traditional or physical classroom setting with the standard curriculum and teaching pattern, while AI has brought an intense revolution in academic learning in terms of intelligent education that can be defined as a combination of innovation or machine learning and knowledge development. AI works more efficiently and intelligently to serve the demand for quality education for all. AI fosters personalised learning by meeting learning-oriented requirements in relation to individual strengths and weaknesses*."

In the context of the positive aspects, the view of the other participants (2&4) could be summarised as AI in academic learning provides significant benefits to teachers well as students. AI assist teachers in improving the knowledge base, customised lesson plans design, students' performance assessment and detection of plagiarism. On the other hand, it helps students to develop skills and knowledge and access personalised performance feedback. AI promotes adaptive learning in the advanced digital and virtual learning era. However,

Participant 4 stated, "*Hmmm.. as per my viewpoint, using AI for educational support is not just lesson plan and content creation, but it is more than that. As per my outlook, AI-based learning is the initiative towards personalised learning due to the availability of the virtual assistant or Chatboat 24*7 accessible from anywhere. AI usage in academic learning is the kind of virtual learning and knowledge development assistance that shares the work of the educators*". It has been interpreted that the versatile and multipurpose usage of AI in academic learning from learner to teacher-oriented eventually contributes toward educational and instructional quality.

Participant 5 said, *"According to me one illustration of AI usage within academic learning might involve the utilisation of AI-enabled chatbots or virtual assistants that are capable of providing students with instant support. These chatbots can provide students with answers to frequently asked questions, resources, or guidance as they navigate specific areas. They provide individualised support that is accessible around the clock, which can significantly improve the overall quality of the educational experience and encourage more student independence".* The interpretation of the above data is that AI has significant usage within the field of academic learning as it helps in virtually and autonomously guiding students regarding study-based specific fields without any restrictions about academic information and time constraints for boosting independent education and learning of students.

Participant 7 indicated, *"We might anticipate highly personalised and adaptable learning experiences that are suited to the specific requirements of individual students as AI technologies continue to progress."* Participant 6 mentioned, *"As a result of AI's ability to automate mundane chores like grading assignments along with offering individualised feedback, educators have been opened up to devote more of their attention to high-level instruction as well as student engagement. In addition to this, it also assists in the analysis of vast volumes of data in order to recognise patterns and trends, which might then lead to more targeted instructional methods."* It is

interpreted with reference to the above-highlighted data findings that AI has been helpful in forming valuable instructions regarding courses, study data and related patterns to shape adequate strategies for delivering worthy teaching sessions to improve students' learning outcomes. The findings have clearly supported in deriving valuable information that AI has strong usage and implications in enhancing academic learning among Saudi Arabia students.

Theme 2: Rationale and Benefits of Student-AI Collaboration

The development of AI is seen as one of the most profound fields of technological development, which has seen an increased integration in the area of education. The findings of the interview also suggested that teachers and professors in Saudi Arabian universities recognise the benefits of Student-AI collaboration for enhancing their learning and academic performance. In this regard, participant 3 stated, '*Student-AI collaboration has enabled us to gain better insights about the learning progress of students and identify the areas of improvement for facilitating appropriately targeted interventions and support*'. Participant 2 further confirmed that '*By incorporating AI into classrooms, we are able to offer students a greater access to wider information and resources which is beneficial for students in developing a deeper understanding of the learning content*'. Based on these findings, it has been confirmed that teachers and professors in Saudi Arabia acknowledge the benefits of AI in educational settings for fostering deeper learning experiences. In a similar regard, participant 6 expressed, '*Student-AI collaboration provides an opportunity to incorporate latest technologies in the classrooms and prepare students for the advancing digital world to navigate their careers*'. Thus, it can be interpreted that the rationale behind the inclusion of AI in classrooms and promoting Student-AI collaboration is to prepare students for the digitalised future.

From the findings, it has been inferred that Student-AI collaboration allows the creation of more personalised and distinguished learning experiences for students that address their unique learning styles and needs. In alignment with this, participant 5 stated, '*Student-AI collaboration offers a chance to develop*

customised learning experience for students based on their personal and individual needs as well as learning styles'. On the other hand, participant 1 informed, '*By promoting the inclusion of AI in classrooms and fostering collaboration with students, we are able to cultivate a culture of creativity and innovation in classrooms by experimenting with AI tools and solve unique challenges*'. Further, participant 4 highlighted the key benefits of Student-AI collaboration, '*AI has made active learning possible where students are able to become active users of the latest technology and apply AI tools for generating and presenting their ideas*'. Therefore, on the basis of the interview findings, it has been revealed that professors foster the inclusion of AI in classrooms to promote active learning experiences and use it for developing personalised learning experiences for higher engagement and cater to their personal and unique learning styles and needs.

Furthermore, AI has allowed students to develop the essential skills of the 21st century, such as digital citizenship, data literacy, and computational thinking. The Student-AI collaboration is also beneficial for students in developing problem-solving skills and critical thinking skills. This was confirmed by Participant 5, '*Working with AI tools and techniques, the students are able to develop problem-solving skill and critical thinking skills*' and Participant 7, '*Implementing AI in classrooms is helpful for students to strengthen their skills that are relevant in the 21st century such as computational thinking, digital citizenship, and data literacy*'. In addition to this, the viewpoints of Participant 2 highlighted, *'AI collaboration with students has enabled us to expand the boundaries of our classrooms and offer an opportunity for students to connect and collaborate with peers and academic experts across the globe for the rich learning experience and foster greater exposure*.' Additionally, participant 6 confirmed, '*AI allowed greater exposure to changing trends in the world and prepare students for evolving dynamics of the market for a successful future*'. Therefore, on the basis of the above findings from the interview, it can be inferred that Student-AI collaboration is

promoted by professors to ensure greater exposure among students and strengthen their skills for successful careers.

Theme 3: Reliability, Accuracy and Integrity of AT-based Learning

In light of the above theme, which focuses on examining the reliability, accuracy, and integrity of AI-based learning, Participant 1 expressed their opinion, stating, "*In my opinion, the use of AI in the classroom has significantly improved the quality of education. Using AI to grade and measure has cut down on human mistakes and made rating standards more uniform*." In contrast, Participant 2 offered a different perspective, stating, "*While I can see the benefits of AI-based learning, I worry about the reliability of AI-based evaluations. The intricate nature of learners' skills and knowledge is not always captured by these methods, which may lead to inaccurate results*." The preceding opinions suggest that the deployment of AI-based learning has improved the trustworthiness of instructional procedures. Standardised evaluations with less room for interpretation have been possible due to automated technologies. There are, however, still doubts about how well AI systems can assess complex understanding. These concerns draw attention to the necessity for continuous oversight and enhancement of AI algorithms to guarantee reliable and impartial assessment.

With respect to the integrity aspect, Participant 3 shared their perspective, stating, "*A high degree of integrity has been established by AI-based learning via the protection of the students' right to privacy and the security of their data. AI programmes ensure students' personal information is kept safe and used correctly*." Conversely, Participant 4 expressed their reservations, stating, "*Even though attempts are made to ensure the security of data, data leaks and unauthorised access to learner information still pose risks. We need to make sure there are strong security steps in place to protect the rights of students.*" Based on the evaluation of the above responses, it has been determined that AI-based education has been successfully keeping student information secure. The introduction of AI algorithms has been crucial in assuring the proper handling and security of

sensitive personal data. Nevertheless, the concerns about data breaches and unauthorised access show that strict security measures and constant assessment of privacy rules are always necessary.

Participant 5 shared their perspective on reliability, stating, "*I have seen that the consistency with which students can access course materials has improved owing to the use of AI for content delivery. Using artificial intelligence, platforms can ensure that students always have access to the most recent and relevant information*." On the other hand, Participant 6 offered a contrasting viewpoint, expressing, "*While there is little doubt that AI-based learning may improve the delivery of content, putting too much faith in AI systems has its risks. To provide a well-rounded educational experience, it is crucial to find an appropriate balance between computerised aid and personal interaction*." Respondent 7 offered their thoughts on the topic, saying, "*I believe that AI-based learning could improve the accuracy of student evaluations with the application of adaptive algorithms.*" These algorithms can discern specific learning requirements and offer focused feedback, resulting in more accurate assessment and customised learning encounters. The participants' viewpoints indicate the potential of AI-based learning to enhance the reliability of content delivery, accuracy of student evaluations and ensure consistent access to up-to-date information. However, it is essential to exercise care when deciding the degree of reliance on AI systems to place alongside human engagement.

Theme 4: Critical Impact on Students' Learning Outcomes

In relation to the above theme, which is dedicated towards the assessment of the critical impact generated by artificial intelligence upon the learning outcomes of the students, Participant 3 exclaimed that, "*Undoubtedly, I believe that artificial intelligence has had a substantial influence on learning-based business outcomes. I have seen that the emergence of smart teaching assistance systems along with the personalised instructional platforms has provided learners with the opportunity to engage in customised educational offering segments*." On the other side, Participant 4 further added that, "*I also*

think that artificial intelligence has demonstrated its significant utility as a beneficial collaborator within educational settings. Automated tutoring systems have facilitated the provision of personalised direction for learners on a large scale." Adding further, Participant 5 added that, "*I feel that through the analysis of student performance-based information, these systems have the capability of recognising areas of knowledge deficiency as well as propose-based assets or activities for tackling these discrepancies*." In relation to the above responses, it is analysed that with the arrival of AI, the new smart tutoring platforms are identified to develop which enable the execution of personalised instructional and learning facilities. Furthermore, it is also reviewed that the use of automated learning platforms has helped in the development of large-scale learning services as well as educational settings. AI has worked in the form of a collaborator in the educational segments.

However, opposing the view of the above respondents, Participant 1 has mentioned that, "*As per my views, the potential consequence of relying exclusively on artificial intelligence-based algorithms for educational purposes are that learners may adopt a passive learning approach. This phenomenon has the potential to impede the cultivation of critical thinking abilities along with creative aptitude, as it could impede the acquisition of autonomous analytical as well as synthesising abilities*." On the other side, Participant 2 has also mentioned that, "*Artificial intelligence algorithms have the capability to furnish individuals with solutions, yet their comprehension of fundamental ideas may be limited. The deficiency in comprehension can manifest itself in examinations or practical scenarios, wherein the continuous suggestions generated by artificial intelligence could potentially restrict the access of learners towards a wide range of ideas*." Therefore, it is critically explored that the use of AI in the educational field has also generated negative outcomes on the learning capacity of the students because AI hinders brain development as the suggestive ideas provided by the help of the AI-based algorithms are not effective for increasing the student capacity to generate their personalised viewpoints as well as utilise their

personal cognition for solving the academic problems. It is further reviewed that the use of AI can also hinder the capacity of students towards understanding the concepts.

On the other side, Participant 7 has added that, "*It is reviewed that the use of AI in academic educational background, has generated a detrimental impact on the educational outcomes of the learners where the critical thinking skills of the students has degraded.*" Apart from this, Participant 6 has also expressed that, "*I believe AI learning tools contribute towards providing quick assistance to the students if they need to receive information about a concept during the times when the teacher is absent.*" In relation to the above-explored research findings, it can be analysed that the critical thinking and creativity of the students are affected by AI which may lead to the generation of poor analytical skills as well as weak conceptual understanding among the learners. Therefore, on an overall basis, it can be summarised that there are both positive and negative implications for the inclusion of the AI within educational domain. AI can play the role of an assistive learner because it offers customised learning facilities to the students in the absence of a real teacher or instructor. However, the self-brain development and idea-generation skills of the learners may hamper due to AI.

6.2 Discussion

The findings assisted in discussing that the use of chatbots that are powered by AI or automated assistants which are able to provide students with immediate support is a significant illustration of the implication of artificial intelligence in the context of academic learning. Students might utilise these chatbots to obtain responses to recurrently asked queries, learning materials, or advice while trying to navigate various areas of the website. They offer personalised help that is available throughout the whole day, which has the potential to significantly enhance the standard of learning as a whole while supporting increased student autonomy in receiving educational guidance (Kuleto *et al.*, 2021). As artificial intelligence technologies keep developing with time, it fostered highly personalised and flexible

learning experiences that are tailored to the particular demands of every student. Educators have been given the opportunity to dedicate huge attention to a high degree of training as well as student involvement as a result of AI's ability to streamline educational processes like evaluating students' tests and homework along with delivering specific comments or feedback on their learning (Pedro *et al.,* 2019). AI is also identified to evaluate large amounts of data so that patterns and trends might be recognised, which might eventually give rise to additional targeted educational techniques.

On the other side, in the direction of critical implications generated by AI on the learning outcomes of the students, it can be discussed on the basis of the collected interview responses that usage of AI in the learning as well as educational domain may lead towards the generation of a positive impact on the learning practices of the students because the integration of the AI learning platforms may provide the students with the customised learning support which may contribute towards improving the potential of the learners in the direction of acquiring understanding regarding the academic concepts. However, the interview responses have also helped in generating new learning about the negative implications of AI towards the critical thinking as well as creativity-oriented capabilities of the learners. The discussion is provided support by the help of external literature sources as it helps to understand that the acquisition of understanding as well as comprehension is undeniably crucial as a basis for learning. However, current advancements in artificial intelligence (AI) have not yet proven effective in facilitating the cultivation of advanced cognitive abilities such as reasoning, problem-solving, and creative thinking, along with knowledge management capabilities among learners. The smart support provided by AI is not helpful for nurturing openness, creativity as well as smart working (Bates *et al*., 2020).

7: Study Implications

7.1 Theoretical Implications

The investigation conducted in this domain may have the potential to provide insights into the impact of artificial intelligence-based technologies on diverse cognitive functions including the

development of learner's memory, concentration, problem-solving, as well as reasoning. This study may offer valuable insights to educational personnel regarding the designing of artificial intelligence-specific tools, with the aim of optimising cognitive processes. Furthermore, the theoretical discoveries which can be revealed through this research may have the potential to enhance the development of new theoretical constructs through the incorporation of artificial intelligence (AI) as a prominent element in the learning process. In addition to the above, it is further examined that this research may prove to be highly supportive towards the influence of artificial intelligence (AI) on the learning capabilities of students which can provide theoretical implications for the disciplines of psychological education as well as motivation. This study aims to investigate the potential of artificial intelligence (AI) technologies for augmenting engagement among learners, study-related motivation, along with self-management. The examination of the impact of AI-based theoretical interventions on student motivation as well as cognitive variables has the potential to advance the field of learning psychological research by facilitating the creation of novel theoretical structures. In addition to the above, it is further analysed that the current study may hold theoretical implications in line with the investigation of the significant influence of artificial intelligence (AI) on educational achievement levels of the learners give rise to theoretical implications pertaining to social, ethical as well as cultural factors. This study aims to investigate the impact of artificial intelligence-based technology on societal relationships, diversity of culture, along with equal treatment of the learners working within educational environments. The research may also encompass ethical issues pertaining to the protection of data confidentiality, the presence of bias in algorithms, as well as the conscientious application of artificial intelligence in the educational domain.

7.2 Practical Implications

The research has the potential to make a contribution to the creation of ethical standards and rules for the application of AI within

academic studies. It has the capability of identifying significant ethical concerns as well as offering recommendations regarding ways to overcome them, thus guaranteeing the appropriate and responsible implementation of AI within research. The findings of the research study might offer decision-makers valuable information regarding the prudence of investing in AI technologies for the academic learning of students at Saudi and worldwide educational institutions. It has the ability to throw light on the possible advantages, constraints, and risks connected with the widespread use of AI, so enabling informed choices concerning the allocation of resources and implementation tactics in academic settings. The results of the study might offer useful information for informing the formulation of rules and regulations about the application of AI in educational institutions. It has the potential to persuade legislators to set norms and standards that tackle challenges in AI-driven research such as confidentiality of information, algorithmic accountability, integrity, and transparency. The study has the potential to shed light on the importance of researchers and educators participating in learning and development programmes designed to improve their understanding of AI and its consequences for academic studies (Holstein, Aleven and Rummel, 2020). It might result in the establishment of specialised training programmes that are intended to provide individuals with the information and abilities required for incorporating AI within their research practises in a way that is both efficient as well as ethical.

8. Conclusion

It is concluded with respect to the central research objective that AI technology provided valuables tools such as chat-support systems which enabled ease of guidance provided to the students regarding the subject-specific areas and related doubts. Further, AI also provides learning at any time whenever students require information about any subject in a flexible and dynamic manner with its intellectual algorithms and programmes. The autonomy of students in the context of educational learning has thereby, increased as they feel free to learn new knowledge with 24-hour supported educational assistance with access to dynamic and any type of information needed by them. Thus,

AI has a valuable rationale in relation to boosting the academic learning of students in Saudi educational settings.

In addition, the interview findings revealed that teachers and professors acknowledge the benefits of AI in educational settings for fostering deeper learning experiences for students for academic performance. Student-AI collaboration promotes the inclusion of the latest technologies in classrooms which is beneficial for students to learn about the digitalised world and navigate their future careers successfully. The professors also expressed that AI promotes and fosters a culture of creativity and innovation in classrooms which presents students with an opportunity to generate unique ideas and solve dynamic problems. This also supports the acquisition of relevant skills in the current times, such as problem-solving skills, computational thinking, digital citizenship, and critical thinking skills, which are crucial for students for successful careers. Furthermore, the use of AI in classrooms educate student about the recent developments in technologies and equip them with the necessary knowledge for future success. The inclusion of AI in classrooms and the promotion of student-AI collaboration are also linked to the benefits of AI in creating personalised learning experiences for students that serve their individual and unique educational needs. This also engages students in active learning processes that support their academic achievement and educational success with the help of greater access to a wide range of resources.

In contrast, the synthesis of information from interviews suggests that incorporating artificial intelligence into the area of higher education has the potential to yield beneficial outcomes for student achievement. By integrating AI-specific learning channels, learners can receive personalised educational services that enhance their ability to comprehend academic ideas and improve their educational capabilities. Nevertheless, the interview responses additionally contributed to the acquisition of new knowledge regarding the adverse effects of artificial intelligence on the cognitive abilities related to inventiveness and critical thinking among scholars.

The discussion is substantiated by the assistance of external scholarly sources, which emphasise the importance of acquiring comprehension and awareness as fundamental components of the learning process. Nevertheless, it is also concluded that the present progress in the field of artificial intelligence has yet to demonstrate its efficacy in promoting the development of sophisticated mental capacities, including deductive reasoning, creativity, problem-solving, and knowledge management skills, within individuals seeking to enhance their capacity for learning. However, it is found that the efficacy of AI-enabled educational services support in fostering transparency, inventiveness, and efficient work practises.

8.1 Limitations and Future-Work

- There might have been a small number of people available for interviews, which might have had a negative impact on the findings' ability to be generalised. In order to provide an adequate representation of people's thoughts and feelings, it is essential to guarantee that those who participated come from a wide variety of walks of life and viewpoints (Bell, Bryman and Harley, 2022). However, it can be difficult to obtain a sample that is truly representative of the anticipated population of students, and it is possible that the findings are inconsistent with the perspectives of the total population of students engaged in AI-based academic learning.
- Interviews are inherently subjective because they are based on the personal experiences, viewpoints, as well as opinions of the people who participate. It is possible that interviewees have prejudices or previous assumptions regarding artificial intelligence, both of which might impact their comments (Hair Jr, Page and Brunsveld, 2019). It is crucial for the interviewer to maintain objectivity, and it is essential for the research to take into account the possibility of bias in the investigation and evaluation of the findings.
- It is possible for participants to submit answers that are in line with social standards or what they consider to be desirable. It's possible that they'll feel uncomfortable voicing their genuine ideas or worries about the appropriateness of incorporating AI into

educational settings. During the interview process, it might be helpful to strive to create an atmosphere that is both trustworthy and free of judgement.

- It is possible that interviews will only allow for a superficial examination of more complicated subjects due to time constraints. There are numerous facets of the rationale of AI that pertain to academic learning, and it's probable that not all of them can be investigated in depth. Because of this limitation, the findings may not be as comprehensive as they could be, and it's possible that crucial nuances and points of view will be missed.
- The study of the data gathered from interviews requires careful interpretation. Different interviewers have the capacity to interpret the responses of the participants in different ways, which can lead to differences in analysis and possible partiality in the conclusions that are formed. This constraint can be helped to a certain extent by using preexisting frameworks for analysis, doing reliability checks between coders, and triangulating the results with methods of inquiry.

8.2 Future Work

- Surveys can be conducted in future studies with students to acquire fairer and bias-free opinions with a higher level of accuracy due to statistical findings as compared to interviews conducted in the present research (Bell, Bryman and Harley, 2022).
- Longitudinal investigations that encompass a substantial duration enable the acquisition of valuable insights pertaining to the enduring consequences and efficacy of AI in the context of academic learning (Hair Jr, Page and Brunsveld, 2019). Through the systematic examination of alterations in student outcomes, levels of involvement, and teacher practises over a period of time, researchers are able to gain a more comprehensive understanding of the dynamic as well as evolving role of AI in the field of education.
- Further research might investigate the ethical ramifications associated with the utilisation of artificial intelligence in the context of academic learning. Examining subjects such as the security of

data, bias in algorithms, truthfulness, and the influence of artificial intelligence on educational freedom might provide significant perspectives on the ways in which ethical issues can be acknowledged and alleviated.

- Evaluating the influence of AI on various aspects of student performance, including academic attainment, intellectual curiosity, problem-solving aptitude, and cognitive abilities capabilities, might provide significant empirical insights into the justification and effectiveness of integrating AI into educational contexts.

Conflict of Interest

None reported.

Author Contributions

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia

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