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**Artificial Intelligence (AI) in Higher Education: A Threat or Helping Hand in
Improving Student-Instructor Communication**

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**Artificial Intelligence (AI) in Higher Education:
A Threat or Helping Hand in Improving
Student-Instructor Communication**

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Abstract

Purpose: The study aims to summarize current discussions among educational stakeholders regarding the potential benefits and threats posed by Artificial Intelligence.

Methodology: In conducting comprehensive and systematic review, the study utilized the PRISMA flowchart and included only articles published between January 2020 and July 2024. The focus was strictly on peer-reviewed articles, with conference papers, dissertations, and other types of papers excluded. Data was sourced exclusively from EBSCOhost and Google Scholar. Additionally, only articles centered on the higher education industry were considered.

Findings: The findings of this study reveal ongoing debates among educational stakeholders regarding the threats and benefits of AI models. It explains how AI is transforming academic environments by offering personalized learning experiences, enhancing learning outcomes, and increasing student engagement. However, concerns about data privacy have also emerged. To eliminate these concerns, the study recommends the introduction of consent forms that give users the option to allow or deny the use of their data for AI training.

Unique Contribution to Theory, Practice and Policy: The study contributes to the ongoing debates by grounding its analysis in Sociotechnical Systems Theory (STS), emphasizing the need for a human-centered approach in AI adoption. This offers a holistic perspective on how educational institutions can implement AI effectively while addressing stakeholder concerns about privacy and control over data, making it a valuable resource for both academic and policy discussions surrounding AI in education.

Keywords: *Artificial Intelligence, Higher Education, Threats, Benefit, Communication*

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INTRODUCTION

The debate over the integration of artificial intelligence in higher education has been contentious and has made educational stakeholders argue for its transformative potential. Conversely, skeptics express concerns about its impact on academic integrity, learning outcomes, students' critical thinking, instructors' job replacements, and roles in the industry. Since the 4th Industrial Revolution, many sectors, including education, have experienced significant transformation with a notable increase in innovation, particularly from artificial intelligence (AI) due to the COVID-19 pandemic, putting educational stakeholders in a state to make careful decisions in accepting or declining the integration of AI in an academic setting based on the opportunities and threat of these models.

This model's ability to personalize users' learning in ways that nothing else can, makes it even more fascinating to use (Kamalov & Gurrib, 2023). Moreover, the ease at which AI generates and manipulates ideas poses a significant threat to traditional assessment methods, as instructors may struggle to distinguish between human-generated critical thinking ideas and AI-generated work. To tackle these challenges, different scholars have expressed their perspectives on how best to do this. According to Tsou (2024), educators still need to figure out how to take full pedagogical advantage of AI models in a way that could impact teaching and learning in higher education. Hinojo-Lucena et al. (2019) offer another significant idea with the models in question. According to them, educators need more clarity and understanding regarding the scope and capabilities of AI in the educational setting to fully decide whether to add it as one of the educational tools or categorize the model as a threat in the academic setting.

The work conducted by Bates et al. (2020) served as the focus of this study. Their research helped unveil the significance of employing different academic viewpoints concerning artificial intelligence in educational settings. The researchers believe incorporating different perspectives is one of the effective ways of addressing the challenges and opportunities that AI in higher education seems to offer. To achieve this, this study focused on reviews of articles published from January 2020 to July 2024, targeted at instructors or teachers, researchers, and educational policymakers. The review started with articles from 2020 when significant waves of AI adoption began for students and instructors due to COVID-19.

Related Works

The integration of generative AI into the educational field has immense potential to change the lives of learners in remarkable ways. The significant advantage these models have makes them irresistible to do in this 21st century. Over time, studies have consistently demonstrated the unlimited potential of AI models to reshape the educational sector, with the models programmed to set instructions based on set rules by the user (Zhu, 2021). One of the primary benefits of incorporating AI in education is the improved efficiency and personalization of the learning process AI offers users (Chen et al., 2020). Another benefit of AI models is their ability to analyze student data, identify students' learning styles, and tailor the curriculum and instructional methods to cater to each student's unique needs. AI's potential to bridge the gap between students with diverse learning abilities and backgrounds makes the models more powerful and education more inclusive and effective (Mou, 2019).

Furthermore, AI has been classified as a tool that has played a significant role in empowering both instructors and students, which can go as far as automating routine tasks, such as grading assignments, research writing, research paper editing, checking students' originality of papers,

and providing immediate feedback to students, freeing up valuable time for instructors to focus on more complex and impactful activities, such as engaging with students one-on-one, developing innovative teaching strategies, and addressing the needs of students with special needs (Mou, 2019). Beyond these immediate benefits, AI can also improve the professional development of academic instructors by providing them with valuable tools and personalized ways to improve their teaching methods and strategies (Alzahrani, 2022).

While the benefits of integrating AI into higher education have been discussed, various researchers have raised concerns about potential threats to this target group. Khawaja and Khawaja (2024) highlight several issues voiced by educators, including threats to students' critical thinking abilities, ethical concerns, algorithmic bias, and potential job displacement and role changes for educators with the study concluding that future implications of AI on higher education are both promising and complex. Adding that even though AI can completely transform education, learning, and administration, it also presents several issues that require early attention. Similarly, Cheng (2023) expresses concern about student privacy and data protection, noting that modern technologies can access personal information, making users' data vulnerable to unauthorized persons raising significant ethical concerns about data security in educational settings.

Purpose of the Study

This study provides a comprehensive summary of key stakeholders' perspectives regarding using emerging technologies, particularly artificial intelligence, in higher education. The researchers believe explaining these educational stakeholders' viewpoints will help students and other concerned personnel better answer the Why, what, and How questions related to AI in academic settings.

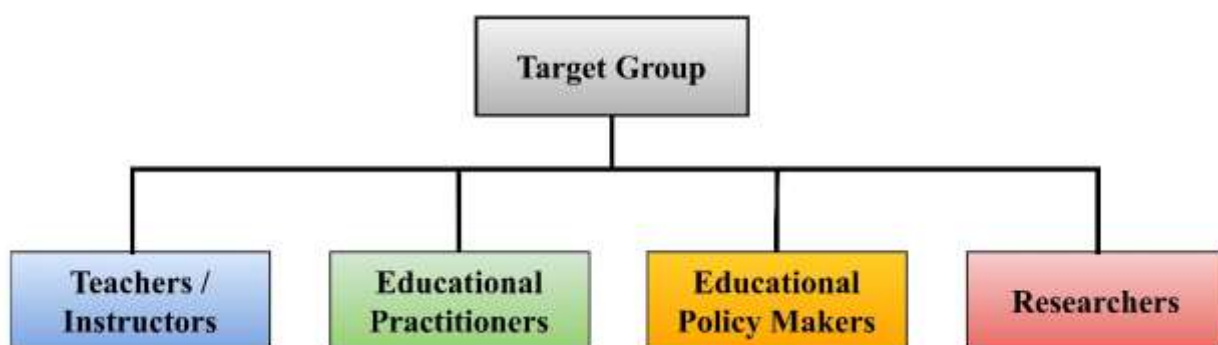


Figure 1: Education Stakeholder's



Figure 2: Predominant Article Title Keywords

Theoretical Framework

In this study, Sociotechnical Systems Theory (STS) developed by Emery and Trist was explored to give an overview of the role of artificial intelligence (AI) in higher education Ropohl (1999). STS is a theoretical framework that focuses on the interdependence of social and technical factors in complex systems (Sosa-Díaz et al., 2022). It was initially applied to the workplace and organizational design but has evolved to cover a broad range of settings, including education and technology. The theory is of the belief that for any system to function effectively, there must be a balance between its social (human) elements and its technical (technological) components Ropohl (1999). This theory is particularly relevant to this study as it helps explain how AI, as a technological advancement, interacts with the educational sector, which includes educators, students, and other stakeholders. By applying STS, the study was able to understand not only the benefits of AI but also the challenges that arise when integrating technology into educational settings.

The relevance of STS in this study derives from its ability to provide a holistic view of the educational system. AI technologies impact not just on learning outcomes but also the roles of educators, student engagement, and overall institutional culture. By using STS, the study explores how educational stakeholders must adapt to the presence of AI, ensuring that technological advancements enhance rather than disrupt existing social structures. This approach helps identify the balance required between the usage of AI's potential and

maintaining effective communication, collaboration, and ethical considerations among all parties involved.

This study is supported by a comprehensive review of existing literature from various studies that have utilized STS to examine technology integration in education. This review established a solid foundation for this study analysis, demonstrating that STS has been validated in similar contexts. For instance, research has shown that when educational institutions consider both technical tools and human factors, they achieve better educational outcomes. This supports the key principle of STS that technological change must be accompanied by changes in the social systems in which it is embedded (Jeladze & Pata, 2018). One relevant example is the study conducted by Navarro-Bringas et al. (2020). In their study, they emphasize the necessity of understanding the complexities of both social and technical components when designing educational systems. Their findings support the idea that incorporating a sociotechnical perspective not only enhances learning environments but also facilitates a more effective integration of technology. Moreover, Thái et al., 2021 research provides further validation of STS in educational settings. They found that institutions that successfully implement new technologies are those that actively engage stakeholders and foster collaborative environments, aligning with STS principles.

Additionally, Upadhyaya and Mallik (2013) explored the impact of sociotechnical factors on the adoption of e-learning tools in Sociotechnical Systems. Their research concluded that understanding the interplay between social dynamics and technological capabilities leads to more successful e-learning implementations.

These studies collectively illustrate that integrating STS principles into educational technology can significantly enhance both teaching and learning outcomes. By addressing the complexities of the educational settings and fostering collaboration among stakeholders, institutions can create more effective and adaptive learning environments, ultimately leading to improved student engagement and success.

METHODOLOGY

This research employed a systematic review approach. This approach is one of the highest forms of evidence and is used to provide reliable and consistent results to improve decision-making (Melnyk & Fineout-Overholt, 2019). Systematic approach was utilized since it helps researchers get a deeper understanding of a subject matter by pooling and analyzing the results of multiple studies on a similar topic. In this research, the researchers used Preferred Reporting Items for Systematic Reviews (PRISMA) using the PRISMA chart to display the flow of information throughout the research process. The chart helps to improve transparency and quality of systematic reviews (Alotaibi & Alshehri, 2023a)

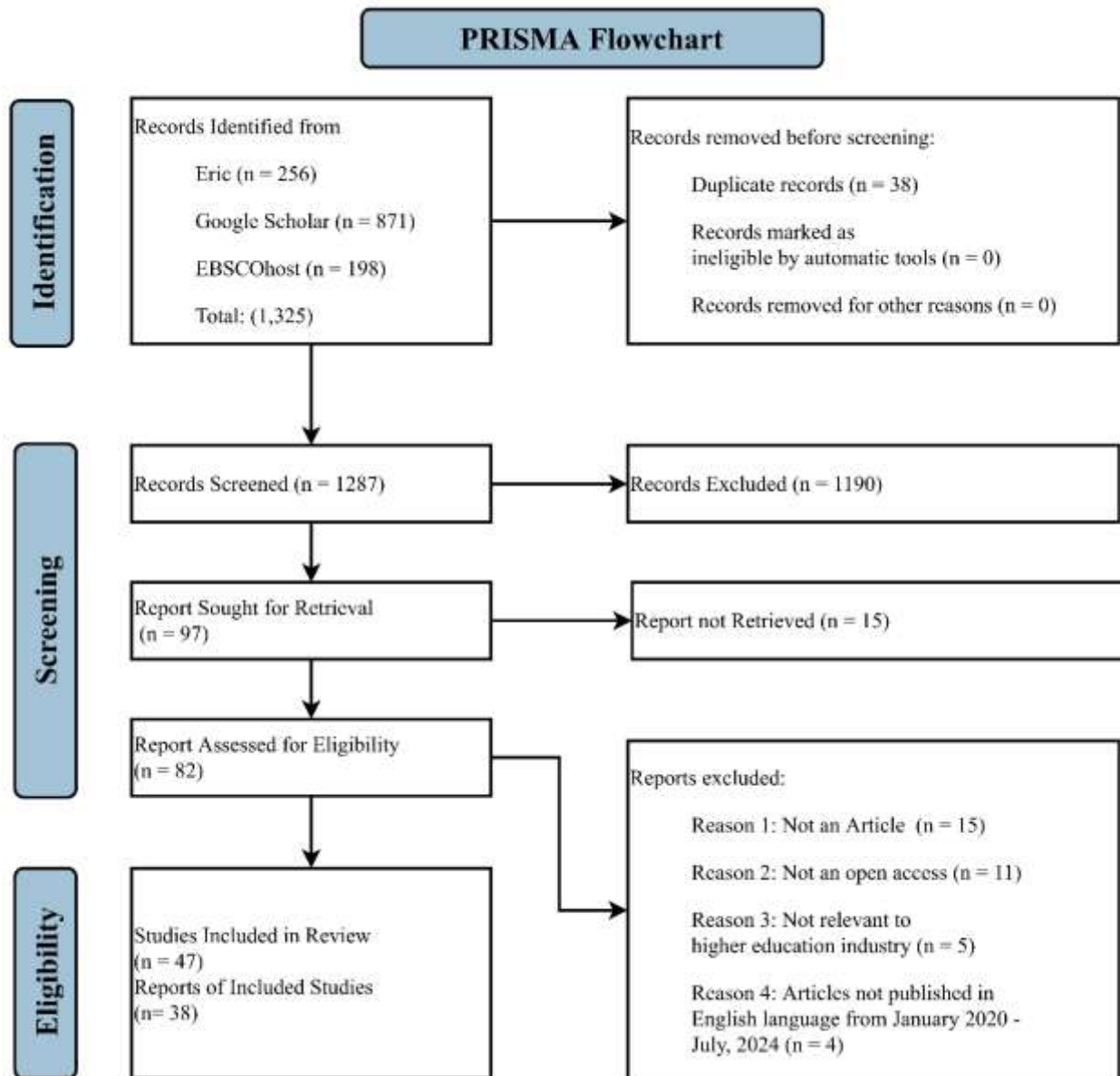


Figure 3: PRISMA Chart

Please note: This study’s inclusion and exclusion criteria are handled by the researchers rather than using automated tools. The researchers coordinate this to ensure accurate assessment and adherence to research criteria. This exclusion is intentional to remove any errors or discrepancies that may arise from automation tools. The decision to use a human operator in this process is based on the need to get closely related articles that automated systems may not fully capture.

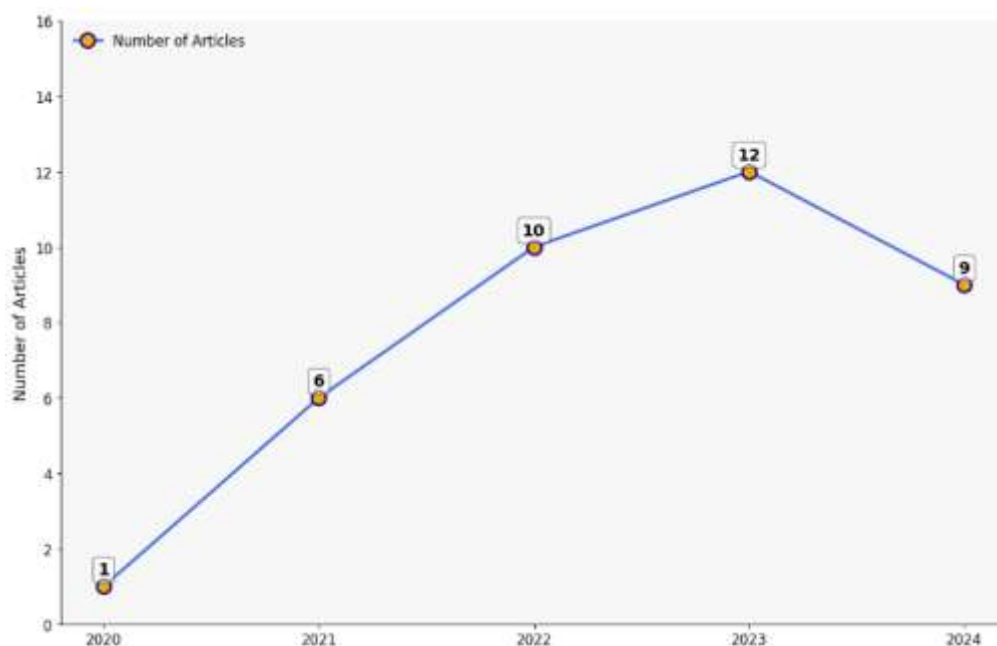


Figure 4: Year of Publication

Literature Search and Selection Criteria

This study utilized three well-known academic databases to ensure the reliability and transparency of any form. These are Google Scholar, ERIC, and EBSCOhost. These databases were chosen to cover a wide range of academic articles related to the usage of AI in higher education to improve communication between students and instructors. Basic keywords such as “artificial intelligence,” “higher education,” “threat,” “opportunities,” “student,” “instructor,” and “outcomes” were used to search each database to ensure the inclusion of relevant studies.

Inclusion and Exclusion Criteria

The research utilized articles published from January 2020 to July 2024, reflecting the increase in AI usage during the pandemic and its transformation of education, student learning, and the role of instructors. All selected articles were from open-access journals to ensure they were easily accessible to both researchers and any interested readers. Conference papers, theses, dissertations, reports, poster presentations, and book chapters were deliberately excluded and only articles related to higher education sector are considered to maintain a focused and professionally rigorous selection of articles.

Data Extraction

After identifying the articles that met the selection criteria, the study delved into each article and summarized its contents. 38 articles were used in this study to understand how much AI has impacted the educational sector from 2020 - July 2024. In this study, key information was extracted from each article by reading the abstract, findings, conclusion to understand the perspective of each educational stakeholder on the integration of AI in higher education, whether they view AI as a threat or a helping hand in improving communication between student and instructor.

Table 1 compiled key findings from various authors regarding the role of artificial intelligence (AI) in education across different countries. The following table summarizes their

contributions, highlighting how AI can enhance teaching effectiveness, improve student engagement, and support educational outcomes:

Table 1: Key Findings from Various Authors Regarding the Role of Artificial Intelligence (AI) In Education across Different Countries

Author	Country	Key findings
Jianbang and Changxin, (2021)	China	Using AI to improve teaching effectiveness by accurately tracking student participation and performance.
Jiang (2022)	China	AI-based approach enhances helping to predict the capability of vocational education students in understanding Chinese Traditional Culture
Chen and Su (2022)	China	Integrating AI and internet technology helps to improve efficiency in universities.
Li et al. (2022)	China	Artificial intelligence helps optimize online mental health education in universities by providing accurate data and resources for personalized and effective learning experiences.
Xia and Liu (2022)	China	Using wireless communication and artificial intelligence in classrooms leads to better adaptability and teacher-student interaction than in traditional classrooms.
Fan et al. (2020)	Canada	AI has the potential to do much more for students than traditional tools
Teng et al. (2023)	China	AI helps to get student data, track graduation rates, and curriculum design to improve performance in higher education institutions.
Wang and Wang (2024)	China	Using artificial intelligence is an effective way to evaluate physical education teaching methods in colleges and universities.
Yao (2022)	China	Applying AI model facial expression recognition algorithm in an education management system helps to effectively monitor student classroom status and improve education management.
Nazaretsky et al. (2022)	Israel	AI usage increases teacher trust in educational technology
George and Wooden (2023)	USA	AI can benefit from higher education institutions by automating tasks, personalizing learning experiences leading to increased efficiency and better student outcomes.
Author	Country	Key findings
Nassoura (2022)	United Arab Emirates	AI has the potential to improve student engagement and knowledge retention.
Reiss (2021)	United Kingdom	AI enhances student learning and complements but does not replace human teachers soon.
Kobis and Mehner (2021)	Germany	AI-supported mentoring environments in higher education
Toli (2023)	India	AI into Indian higher education can improve learning by personalizing education, increasing access, and changing teaching methods.
Soraya (2024)	Indonesia	AI's potential to customize learning experiences, improve educational assessments, and optimize resource allocation in higher education.
Alotaibi & Alshehri (2023b)	Saudi Arabia	Although AI is in its preliminary stages in Saudi Arabian higher education and faces implementation challenges, it holds significant potential to improve learning outcomes and achieve Saudi Vision 2030 goals.
Alshahrani et al. (2024)	Switzerland	The Semi-systematic literature reviewed reveals a growing interest in AI's potential to enhance higher education.
Polat et al. (2024)	Türkiye	The findings show the growth of interest in leveraging ChatGPT for educational purposes
Van Horn, 2024	South Korea	Students responded positively to using ChatGPT as a language learning tool, showing sustained engagement and a desire for its continued use in education.
Sumakul et al. (2022)	Indonesia	EFL teachers have positive perceptions of AI's potential in the classroom to assist both teachers and learners.
Alrayes et al. (2024)	Bahrain	Bahraini academics recognize the potential impact of ChatGPT in education, their adoption is influenced by factors like perceived ease of use and social influence.
Kanont et al. (2024)	Thailand	Thai university students' adoption of Generative-AI tools is influenced by expected benefits, perceived usefulness, attitude towards technology.
Perkins (2023)	Vietnam	AI helps to create original written content that students can use in their assessment

AAuthor	Country	Key findings
Abbas et al., (2023)	Pakistan	As higher education navigates the digital age, artificial intelligence emerges as a transformative force, enriching students' educational journeys and elevating their academic performance.
August and Tsaima (2021)	USA	AI enables instructors provide a higher level of guidance, feedback, and give autonomy to learners
Saaida (2023)	Palestine	AI can revolutionize higher education by personalizing learning, optimizing administrative processes, and enhancing research capabilities.
Vargas-Murillo et al. (2023)	Peru	ChatGPT can enhance academic and librarian processes.
Moscardini et al. (2022)	United Kingdom	Universities should adapt to societal changes driven by technology and AI, shifting focus from job training to cultivating a fulfilling life with increased leisure time.
Liu (2022)	China	Artificial intelligence technology is destined to change our world, including the place of learning

Table 2 examined the perspectives of various authors who view artificial intelligence (AI) as a potential threat to education. The table below summarizes their findings, highlighting concerns related to decision-making, privacy, and critical thinking:

Table 2: Examined the Perspectives of Various Authors Who View Artificial Intelligence (AI) as a Potential Threat to Education

Authors	Country	Key findings
Ahmad et al. (2023)	Pakistan and China	AI significantly impacts the loss of human decision-making and makes humans lazy. It also impacts security and privacy. The findings demonstrate 68.9% of laziness in humans, 68.6% in personal privacy and security issues, and 27.7% in the loss of decision-making among students are due to the impact of artificial intelligence
Kamalov et al. (2023)	UAE	Students share sensitive personal information, which could be vulnerable to data breaches or misuse.
Karimi and Khawaya (2023)	United Kingdom	Threat to Critical thinking abilities
Alexander et al. (2023)	Cyprus	Threats to critical thinking skills, ethical dilemmas, algorithmic bias, and the potential for job displacement among educators

Table 3 summarizes the perspectives of various authors who express uncertainty regarding the use of artificial intelligence (AI) in educational settings. The findings highlight concerns about funding, accuracy, and the limitations of AI applications:

Authors	Country	Key findings
Ajani et al. (2022)	Nigeria	Nigerian academic libraries are aware of AI and its potential, they are not ready to implement it due to a lack of funding, expertise, and infrastructure.
Friederichs et al. (2023)	Germany	Failed to answer some medical questions correctly. Based on the inability to differentiate diagnosis of chest pain, therefore it is uncertain this model can be useful in medical education
Carabanites et al. (2023)	Spain	AI language models show potential as assistants in reviewing scientific papers, but their limitations, such as hallucinations and context window limits make educators uncertain of their potential.
Memarian and Doleck (2023)	Canada	AI is great but the plagiarism deception, misuse or lack of learning, accountability, and privacy make these models uncertain to be allowed in learning settings

RESULTS

There is no gainsaying that the debate over integrating AI in higher education has drawn the attention of many educational stakeholders over the years. Table 1- 3 above presents a tally of prominent researchers in this ongoing discussion. Since 2020, these researchers have addressed in writing the impact of AI on education on a range of important stakeholders, including

policymakers, practitioners, and both researchers and teachers in the higher education context. This information, drawn from three databases, culminates in a total of 38 articles from different countries around the world, including the USA, China, United Kingdom, Germany, Nigeria, and other countries.

The table indicates that only a few scholars have addressed the overarching trends and significance of AI in higher education from 2020 to 2022. However, there has been a notable shift in focus around 2023. Before this period, researchers primarily explored the general importance of AI. However, in 2023, there was an increase in discussions about both the advantages and potential threats associated with AI integration into educational settings. For example, a study by Toli (2023) highlighted the benefits of AI tools in personalizing learning experiences and improving administrative efficiency. Conversely, Karimi & Khawaja (2023) pointed out concerns such as data privacy issues, inability of students for critical thinking and the potential for widening educational inequalities.

Overall, the table shows indeed that there have been some discussions on emerging trends, opportunities, and challenges among scholars about AI in higher education from 2020 to July 2024. This evolving discussion among educational stakeholders reflects the advancement of integrating AI into educational settings and the need for all concerned stakeholders to discuss the associated challenges and opportunities.

FINDINGS AND DISCUSSION

In 2020, the discussion began with a mix of feelings of the transformative potential of these models, making researchers explore how AI integration into student curricula could change student engagement. For example, Fan et al. (2020) examined the impact of integrating AI into the student experience, especially in terms of engagement. They illustrated how AI could do much more for students than traditional tools. Their findings demonstrated that AI tools could significantly improve students' learning experiences by providing personalized learning pathways, improving comprehension, and facilitate better communication between students and instructors. These advancements are seen as promising, suggesting that AI could be an asset in education.

From 2021 to 2022, there was a notable shift in literature, with increasing emphasis on the advantages of AI integration in higher education. Scholars began to extensively discuss how AI could support educational processes, focusing on its potential to improve learning outcomes. Studies during this period examined various AI applications, such as adaptive learning platforms that best suit educational content to serve individual student needs and other AI tools that can assist educators to concentrate more on research as well as creating one-on-one engagement with students.

From 2023-2024, many researchers began to raise concerns on the threat and drawbacks associated with AI integration. Kamalov et al. (2023) identified potential threats in the industry which include invasion of data privacy in which students share their sensitive personal information, which could be vulnerable or misused by anyone. This brought more fear to the user to provide necessary information that could enrich AI information output to a subject matter. However, developing countries, particularly from Nigeria and Egypt share comments in which AI integration that cannot be effective in their respective countries due to two factors. Firstly, lack of resources to effectively implement and maintain AI tools, this includes limited access to the technology itself as well as insufficient infrastructure to support the use of AI in

the industry. The researchers noted that the cost of integration of AI into higher education is quite high, and the country has no available funding to support the models unlike the developed countries. Secondly, there is a lack of adequate training for instructors, practitioners, and researchers on how to use AI effectively. No doubt, AI usage in any educational sector requires constant training, evaluation and upgrading from time to time, without competent trainers as well as providing necessary training to upgrade their knowledge, it will be a challenging task integrating AI into the system.

Another concern is the reliability of these models and their applicability across different fields are quite worrisome which has made researchers not certain of their capacity. Researchers are still not certain of the extent to which these models could help in medical education based on their inability to answer medical questions accurately due to programming limitations. This raises concerns about the reliability of AI tools, especially in critical areas like medical education, where incorrect information has profound consequences. Secondly, the quality of decision-making these models make is worrisome which makes researchers categorize it as an in dependable tool. This uncertainty about AI's capacity to provide accurate and beneficial outcomes continues to become a topic of debate among contemporary educational stakeholders.

Based on the findings from the review's articles, there is dedicated support for the notion that AI can improve student learning, comprehension, and communication. However, there are still significant concerns to consider. These concerns revolve around critical thinking, academic integrity, and the reliability of the AI models, especially in the medical field. Despite these challenges, over 79% of reviewed articles agree that AI has the potential to improve learning outcomes, communications, and efficiency in higher education. Although, its integration is still considered uncertain in some contexts, particularly in specialized fields like medical education (Friederichs et al., 2023).

Recommendations

Based on the findings, we make three recommendations for policymakers, instructors, researchers, and AI developers.

Policymakers: Policymakers should consider the integration of AI by giving room for AI projects with appropriate funding to allow student and instructor-led AI projects. Also, policymakers can ensure training programs for instructors to equip them with adequate knowledge of these models. Lastly, courses teaching the basics of AI to instructors are highly recommended to enable AI literacy.

Instructors: There is no need for instructors to worry that these models will put them out of work. Instead, they can take models like ChatGPT as an opportunity to find better solutions on how to use their time judiciously. Moreover, humans are the rail on which artificial intelligence runs. Without human control or support, AI has no path to follow. Instructors can help students use AI as a learning tool by framing it to help them understand its potential to assist and enhance their thinking. While the industry has worried and speculated about job loss in the era of AI, instructors should be able to enlighten students to think of these models as tools that can help create new jobs in the labor market.

Researchers and Developers: The entire AI process solely relies on educational researchers and AI developers. They make the whole AI process work. Anyone who develops or uses an AI model must always ensure that they are doing something ethical and, preferably, something

that helps solve a problem. Meanwhile, these AI models must improve if these tools are to help any sizeable portion of society. In addition, researchers and developers of the models need to understand each loophole of every model and work towards eradicating or reducing the risk attached to these models to a minimal level.

Furthermore, ethical considerations must be addressed; AI should be developed in a manner that protects privacy and ensures accuracy. This involves ensuring that AI models are restricted from invading users' data and generating reliable information. Since data is essential for training these models, it is essential to implement a process where a consent form is displayed on each request queried by users. This form should explicitly ask users whether they consent to their data being used for training purposes. Should users choose not to share their data, their decision must be respected and upheld.

Conclusion

In conclusion, communication is an essential skill that everyone should possess, irrespective of their profession, as it is crucial to humans. Technology, particularly artificial intelligence (AI), has become deeply integral and indispensable in the 21st century, and the possible time for its extinction or when it will be of no use remains unknown to everyone.

As technological advancements continue, it is important to find ways to improve and adapt. Reviews from 2020 to July 2024 explain the importance of integrating AI into higher education. This integration is critical, and it is essential to provide comprehensive training for all key stakeholders to effectively utilize AI in educational contexts.

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