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Threats and Opportunities of Students' Use Of AI-Integrated Technology (ChatGPT) in Online Higher Education: Saudi Arabian Educational Technologists' Perspectives

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Article abstract

This research study explored the perspectives of 20 educational technologists from four Saudi Arabian universities regarding the integration of AI-powered technology, particularly ChatGPT, into online higher education. The study used a qualitative research method that relied on the principles of theoretical sampling to select participants and conducted in-depth interviews to collect their insights. The approach taken for data analysis was thematic analysis, which uncovered a rich range of insights on both the challenges and opportunities associated with students' use of AI-integrated technology in the context of online higher education. Ten significant challenges emerged that shed light on the complexities and intricacies of integrating AI-powered technology into educational environments. These challenges included issues related to technological infrastructure, pedagogical adaptation, and the need for comprehensive training programs to empower both teachers and learners. Additionally, eight threats were examined that highlighted concerns about data security, privacy, and potential risks associated with AI technology in educational institutions. This study not only provided a comprehensive overview of the current landscape of AI-integrated technology in Saudi Arabian higher education, but also provided valuable insights for education stakeholders, technologists, and policy makers. It underscored the necessity of proactive measures to mitigate challenges and threats while harnessing the opportunities presented by AI technology to enhance the quality and effectiveness of online higher education.

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Abstract

This research study explored the perspectives of 20 educational technologists from four Saudi Arabian universities regarding the integration of AI-powered technology, particularly ChatGPT, into online higher education. The study used a qualitative research method that relied on the principles of theoretical sampling to select participants and conducted in-depth interviews to collect their insights. The approach taken for data analysis was thematic analysis, which uncovered a rich range of insights on both the challenges and opportunities associated with students' use of AI-integrated technology in the context of online higher education. Ten significant challenges emerged that shed light on the complexities and intricacies of integrating AI-powered technology into educational environments. These challenges included issues related to technological infrastructure, pedagogical adaptation, and the need for comprehensive training programs to empower both teachers and learners. Additionally, eight threats were examined that highlighted concerns about data security, privacy, and potential risks associated with AI technology in educational institutions. This study not only provided a comprehensive overview of the current landscape of AI-integrated technology in Saudi Arabian higher education, but also provided valuable insights for education stakeholders, technologists, and policy makers. It underscored the necessity of proactive measures to mitigate challenges and threats while harnessing the opportunities presented by AI technology to enhance the quality and effectiveness of online higher education.

Keywords: AI-integrated technology, ChatGPT, higher education, online learning, threats, challenges, education technologists

Threats and Opportunities of Students' Use Of AI-Integrated Technology (ChatGPT) in Online Higher Education: Saudi Arabian Educational Technologists' Perspectives

The dominant perspective regarding artificial intelligence (AI) technologies has largely revolved around understanding these systems as a collection of processes and their corresponding responses, emphasizing qualities such as autonomy, adaptability, and interactivity (Ahmad et al., 2020; Baker et al., 2019; Chai, Lin, et al., 2020; Chai, Wang, & Xu, 2020; Dai et al., 2020; Dignum, 2021; Druga et al., 2019). These characteristics are considered fundamental technological focuses that researchers have argued should be integral to AI systems. Although autonomy, adaptability, and interactivity are considered extremely important, they may not cover all the essential criteria for an effective K–12 education. Specifically, these criteria are about skills that are taught by human educators, such as self-efficacy, technical skills, and socialization skills. Samuel (2021), building on Dignum's (2021) notion, emphasized that AI technologies should not only replicate human actions, but also mimic expressions of human intelligence, cognition and logic. This highlighted the need to refine features that determine effective AI in education. The recent challenges in education due to the COVID-19 pandemic provided a unique opportunity to examine the demands on stakeholders, including educators, students, and parents (Fourtané, 2020; Ghallab, 2019; Samuel, 2021; Samuel et al., 2022, 2020).

Prior research in decision support systems, particularly in knowledge support systems and decision support systems (DSS), has focused on their interaction with humans and their impact on decision-making and information dissemination. Kasper (1996) outlined the design theory for DSS, emphasizing optimization for effectiveness. Sankar et al. (1995) highlighted the importance of adaptability in DSS interfaces for favorable decision-making, while Gonzalez and Kasper (1997) found that increased interactivity was associated with enhanced decision-making. Ulfert et al. (2022) observed that higher autonomy in DSS reduced information overload but could impact technostress and intention to use.

The boundary between artificial intelligence and decision support systems is not clear. López-Fernández et al. (2011) suggested that knowledge support systems and decision support systems were extensions of AI research. Phillips-Wren (2012) discussed AI algorithms that provided so-called intelligence to these systems, often using techniques such as neural networks and machine learning. Turban (1995) referred to intelligent systems as expert decision support systems. However, the definition of truly AI-powered tools for specific educational goals has remained unclear. Different areas such as finance and healthcare have different needs. In finance, AI tools can work autonomously (Pelaez et al., 2022). In healthcare, AI often acts as a decision support system subject to human supervision (Panch et al., 2018). In education, the interaction is dynamic, as AI interacts with K–12 learners. Miller (2019) explored human-AI interaction, particularly in robotics, where AI learned from human behavior, establishing a learning loop. Identifying core attributes and applications of AI in education requires careful scrutiny, given the high subjectivity of outcomes contingent on response quality.

The integration of AI in online higher education, specifically through platforms like ChatGPT, has introduced a paradigm shift in the way students access and interact with educational content. While there is growing interest in the opportunities and challenges associated with students' use of AI-integrated

technology in online higher education, this study focused on examining these aspects from the unique perspective of Saudi Arabian faculties. This emphasis was crucial because of their pivotal role in shaping the educational experiences of students in Saudi Arabia, a country known for its robust online education ecosystem.

This study looked at the increasing adoption of AI-integrated technology such as ChatGPT in Saudi Arabian online education, driven by demographic changes, technological advancements, and global events. It focused on faculty perspectives and provided a faculty-centric view of AI integration, which has been a gap in the existing research. The cultural context, threats, and opportunities of AI, as well as the unique characteristics of ChatGPT, were the key focus of the study. This study sought to understand how Saudi Arabian faculties perceived the opportunities and risks of ChatGPT in online higher education, and to contribute valuable insights to the discourse on AI in education. Specifically, the following questions were raised:

1. What are the opportunities for students' use of AI-integrated technology (i.e., ChatGPT) while attending online higher education, from the perspectives of educational technologists in Saudi Arabia?

2. What are the threats of students' use of AI-integrated technology (i.e., ChatGPT) while attending online higher education, from the perspectives of educational technologists in Saudi Arabia?

Literature Review

The integration of AI into education stems from fundamental work on decision support and knowledge support systems that has evolved since 1989 with the founding of the *Journal of Artificial Intelligence in Education* (Holstein et al., 2018; Leelawong & Biswas, 2008; Williamson & Eynon, 2020). Notable advances, including the development of Betty's Brain, intelligent tutoring systems, and AI infrastructure, have aimed to improve students' learning experiences. With AI potentially taking on a teaching role, there is a need for research to explore teacher-student dynamics, particularly in K–12 education.

Leelawong and Biswas (2008) examined the effects of student learning facilitated by Betty's Brain, highlighting increased interactivity and feedback, and demonstrating higher learning gains compared to traditional intelligent tutoring systems (ITS). As an extension of ITS research, Holstein et al. (2018) examined combining ITS with real-time analytics for improved teacher monitoring and demonstrated better learning outcomes (Holstein et al., 2018; Leelawong & Biswas, 2008). This positive synergy between AI in education systems and human teaching has highlighted the potential benefits while recognizing the need for further research, particularly in areas related to socialization and psychological challenges in K–12 environments. To optimize the use of AI tools in large classrooms, it is critical to address concerns about scalability and teacher intervention.

While younger students learn academically, they also develop crucial social skills through interaction with peers and teachers. It is essential for students to establish a level of social and emotional comfort with

technology, perceiving it as an extension of the teacher, fostering trust and connection (Frenzel et al., 2009). Regrettably, the social and emotional dimensions have received insufficient attention from researchers (Karnouskos, 2022). Intrinsic factors like sociability, enjoyment, and adaptability significantly influence AI acceptance, especially when AI is delivered via robots (De Graaf & Allouch, 2013). Students' behavior and learning outcomes are profoundly shaped by their interactions, attitudes, and emotions towards technology (Karnouskos, 2022). Some companies have explored emotional robots to serve therapeutic roles akin to support animals (Karnouskos, 2022).

Online education, as the second area of this study, has garnered substantial attention within the scholarly literature that explores technology-based learning. Recent developments, notably accelerated by the COVID-19 pandemic, have prompted a thorough examination and investigation of the transition to online learning and the attendant challenges.

A significant body of literature in this domain has centered on online learning environments tailored for adult learners, particularly within the context of college programs. Universities, due to their relatively greater financial resources compared to elementary and secondary schools, have been better equipped to integrate technology into their educational offerings. Entire markets have emerged around online education, with universities that exclusively offer online programs and the advent of massive open online courses such as Coursera and Udemy (Wilson & Gruzd, 2014). Online learning environments have greatly expanded to cover various domains, including coding, business courses, and arts and music classes. Increasingly, platforms like YouTube have been used for educational purposes, often without cost to users, as content creators earn through advertising. The unpredictable and dynamic nature of these technologies has led to a less standardized landscape. The term online learning, a more specific classification within the broader framework of distance learning, has traced its origins to early correspondence schools but is distinguished by its reliance on Internet-based technologies (Kentnor, 2015). Functioning as a pedagogical method, online learning aims to facilitate the transfer of knowledge from an expert, typically a teacher, to a knowledge-seeker, typically a student. The literature in information systems has contributed valuable insights into effective information communication, with theories like media richness and media synchronicity (Dennis et al., 2008) offering a collective understanding of the relationships among information richness, technology suitability, and the nature of tasks. Dennis et al. (2008) specifically categorizes the essential functions of teachers and students, emphasizing conveyance tasks involving knowledge impartation and convergence tasks where students synthesize solutions based on provided information.

In education, key stakeholders, including teachers and students, manifest distinct goals, assessment criteria, technology responsiveness, and reactions to technological stimuli. Research in education, particularly within the context of online learning, has evolved over time to address evolving needs. Initial focuses on design issues and learning characteristics during the 1990s have expanded to encompass intricate aspects, including the examination of learning communities, advanced instructional design methods, and innovative pedagogical approaches (Martin et al., 2020; Neumann & Herodotou, 2020).

Undergraduate students aspire to acquire a wide range of competencies, including vocational skills, and they exhibit a genuine curiosity for knowledge (Reed et al., 2022). These students need a unique set of skills in an online learning environment to thrive in a constantly evolving business landscape, including remote

peer engagement and proficiency in using digital technologies for knowledge acquisition (Roper, 2007). Considering this diversity in goals and learning methodologies, the role of AI in education should be highly adaptable and sensitive to the distinct needs and developmental stages of younger learners.

Methodology

Sample and Procedure

The participants in this study were 20 Saudi Arabian educational technologists. These individuals were specifically recruited for their expertise and knowledge in the field of educational technology in Saudi Arabia. The selection of participants was based on a purposive sample with the aim of including individuals who could provide valuable insights into the threats and opportunities associated with students' use of AI-integrated technology in online higher education. The researchers contacted potential participants through professional networks, educational institutions, and relevant organizations in Saudi Arabia. A qualitative research approach was used to explore Saudi educational technologists' perspectives on the threats and opportunities of students' use of AI-integrated technology in online higher education. This approach enabled an in-depth discussion of the participants' viewpoints, experiences, and insights. Data was collected from participants through individual, semi-structured interviews, conducted either in person or via online platforms such as video conferencing tools, depending on participants' preference and availability. The researchers followed an interview guide that included a series of open-ended questions designed to explore various aspects related to the topic. The aim of the questions was to obtain participants' opinions on the potential threats and opportunities of AI-integrated technology in online higher education, as well as their experiences, observations, and recommendations. The interviews were audio-recorded with the participants' consent to ensure accurate data capture. The researchers also took detailed notes during the interviews to supplement the audio recordings. The interviews were conducted in Mandarin Saudi Arabi, the participants' native language, to ensure clear communication and a comfortable environment for sharing their perspectives**.**

Data Analysis

The data obtained from the interviews were transcribed and translated into English for analysis, while ensuring that the original meaning and intent of the participants were retained. A thematic analysis approach was used to identify and analyze recurring patterns, themes, and key findings in the data. The analysis process included several steps. First, the researchers read and re-read the transcripts to familiarize themselves with the data. The first codes were then generated to label and categorize meaningful sections of text. These codes were reviewed and refined through an iterative process, and connections among codes were explored to identify overarching themes. The themes were further refined and organized into a coherent framework that captured the participants' perspectives on the threats and opportunities of students' use of AI-integrated technology in online higher education. The data analysis process was conducted systematically to ensure the trustworthiness and validity of the findings. The researchers maintained an audit trail, documenting decisions made throughout the analysis process to enhance transparency and replicability. Additionally, member checking was performed by sharing the preliminary

findings with a subset of participants to validate the interpretations and ensure alignment with their perspectives.

Results

Opportunities in Student Use of AI-Integrated Technology

The first research question explored the opportunities of AI-integrated technology (i.e., ChatGPT) for higher education from educational technologists' perspectives. Interviews with 20 educational technologists were thematically analyzed to reveal and refine 10 main themes, each consisting of two or more sub-categories. Each theme is explained and exemplified below.

Enhanced Personalization

AI-integrated technology, such as ChatGPT, can provide customized learning experiences to individual students. This enhanced personalization involves adapting educational materials, learning paths, and instructional methods to cater to specific needs, learning styles, and pace of each student. This approach aims to optimize the learning process by tailoring it to the unique requirements and preferences of students, ultimately improving their engagement and outcomes. The following quotation exemplified the extracted theme:

> The use of AI-integrated technology enables tailored content delivery and enables educators to provide students with learning materials that match their specific interests and learning styles. This personalized approach allows students to engage deeply with the topic and enhances their overall learning experience. (Professor 2)

Increased Access to Information

A large collection of resources and educational materials have become more readily available through digital platforms. As a result, learners can study a variety of academic subjects and participate in ongoing learning. Using technology, students can access information beyond traditional classroom resources, such as online libraries and diverse learning materials, which broadens their knowledge and promotes a culture of lifelong learning. As Professor 3 argued:

> The digital age has transformed education by giving students unprecedented access to information. Extensive online libraries offer a wealth of resources that students can access, allowing them to delve deeply into interesting topics and learn in a self-directed manner. This democratization of knowledge promotes a culture of continuous learning and empowers students to become lifelong learners.

Efficient Feedback Mechanisms

AI technology has provided efficient feedback mechanisms to give students timely and helpful feedback. By highlighting areas of strength and areas that need more work, this feedback helps students understand concepts and perform better. AI gives teachers the ability to provide students with personalized feedback

to help them monitor their progress, pinpoint areas for growth, and modify their learning approaches. This is made possible by real-time assessment and comprehensive performance analytics. As Professor 8 pointed out:

> Detailed performance analysis through AI technology provide valuable insights into student learning progress. By analyzing data on their performance, engagement, and learning patterns, educators can gain a comprehensive understanding of students' strengths and areas that need improvement. This allows for personalized feedback that guides students toward targeted learning strategies and ultimately promotes their academic growth and success.

24/7 Accessibility

Through 24/7 access, the availability of AI-enhanced systems enable students to interact with educational content whenever they choose, thereby offering flexibility and convenience. Students can access educational resources and engage in learning activities in accordance with their unique schedules and time zones thanks to flexible learning hours and global access. This accessibility creates educational opportunities for people all over the world and gives students the power to take charge of their education. According to Professor 10:

> AI-powered systems that provide 24/7 accessibility have changed the learning landscape. With flexible learning times, students can study educational content as they wish and thus balance their studies with other commitments. This flexibility promotes a learning orientation.

Professor 7 noted that AI systems offer an "approach that enables personalized learning experiences and takes into account the different needs and learning styles of students."

Global Collaboration

We have seen opportunities for international collaboration facilitated by online education with AI integration. Global collaboration allows students to engage with peers and educators from diverse cultural backgrounds, fostering cross-cultural communication and providing a platform for diverse learning experiences. Through virtual classrooms and collaborative projects, students can broaden their perspectives, develop intercultural skills, and gain a deeper understanding of global issues. Professor 12 illustrated this theme:

> Diverse learning experiences facilitated by online education with AI integration enrich the educational journey for students. By interacting with educators and fellow students from diverse cultural backgrounds, students gain exposure to different perspectives, approaches, and problem-solving techniques. This exposure enhances their critical thinking abilities, and adaptability, and prepares them to thrive in an interconnected and interdependent world.

Interactive Learning

AI technology can provide engaging and interactive learning experiences for students. By incorporating elements such as gamified learning and immersive simulations, AI enhances student engagement and motivation. These interactive approaches make the learning process more enjoyable, encourage active participation, and facilitate a deeper understanding of the subject matter.

> Immersive simulations powered by AI technology provide students with hands-on learning experiences. These simulations simulate real-world scenarios, allowing students to apply their knowledge, make decisions, and observe the consequences of their actions in a safe and controlled environment. This interactive approach enhances student understanding, critical thinking, and problem-solving skills. (Professor 13)

Cost-Effective Education

Increased affordability and reduced financial barriers have been enabled by use of online AI-integrated platforms. These platforms offer cost- effective education options that have the potential to lower tuition costs and provide savings on commuting and accommodation expenses. By leveraging technology, students can access quality education at a lower cost, making education more accessible and inclusive. As Professor 15 stated:

> The adoption of online AI-integrated platforms in education brings significant cost savings for students. By eliminating the need for commuting and accommodation expenses associated with attending physical campuses, students can access education from the comfort of their homes. This cost-effectiveness reduces financial burdens and expands educational opportunities for a wider range of students.

Remote Learning

AI-powered online platforms have enabled learners to access quality educational opportunities regardless of geographical location, including various remote and underserved areas. AI technology facilitates the delivery of educational content, interactive learning experiences, and collaboration, enabling students to engage in remote learning effectively. This statement from Professor 18 exemplified this theme:

> Remote learning facilitated by AI technology has the potential to bridge the educational divide in underserved areas. By leveraging online platforms, students in remote and underserved locations can access comprehensive educational resources, engage in interactive learning experiences, and collaborate with peers and educators from around the world. This inclusivity in education empowers students who would otherwise face limited educational options.

Data-Driven Insights

AI-generated data has been used to inform teaching methods and improve student learning outcomes. By analyzing data on student progress and curriculum performance, faculties and institutions can gain valuable insights into students' needs and make informed decisions to tailor their teaching methods and improve the curriculum. This data-driven approach enhances the effectiveness of education by aligning it with the specific requirements of students. For instance, Professor 19 stated that "AI-generated data helps faculties tailor teaching methods to meet students' needs. By analyzing student progress, engagement, and learning patterns, educators can provide targeted support and personalize instruction for improved outcomes."

Preparation for the Future

Exposing students to AI-integrated technology equips them with the skills and adaptability needed for a rapidly evolving job market. By focusing on the development of 21st-century skills and technological literacy, education has prepared students to navigate and succeed in a world influenced by AI and emerging technologies. As Professor 17 stated:

> Exposure to AI-integrated technology in education cultivates 21st-century skills in students. Skills such as critical thinking, problem-solving, collaboration, creativity, and adaptability are essential for success in a rapidly changing job market. By engaging with AI and technology, students develop these skills, positioning themselves as adaptable and valuable contributors in the future workforce.

Threats from Students' Use of AI-Integrated Technology

The second research question explored the threats of AI-integrated technology (i.e., ChatGPT) for higher education from educational technologists' perspectives. Interviews were thematically analyzed, revealing eight main themes each consisting of two or more sub-categories. These themes are explained and exemplified below.

Privacy Concerns

The use of AI-integrated technology in education has raises concerns about the privacy of students' data and personal information. As educational institutions collect and analyze student data, it has become crucial to address data security and potential issues related to invasive surveillance. Safeguarding the privacy of students is essential for maintaining trust and ensuring the ethical use of AI technology in educational settings. Professor 12 stated:

> Privacy concerns arise with the use of AI-integrated technology in education, specifically regarding data security. Educational institutions must prioritize robust data protection measures to safeguard students' personal information. This includes adopting encryption protocols, secure storage systems, and strict access controls to prevent unauthorized access or data breaches.

Quality of Content

The proliferation of AI-generated content in education has raised concerns about the variable quality of educational materials, which can impact students' overall learning experience. It is important to address issues related to the accuracy of information and the potential for plagiarism in AI-generated content to ensure that students receive reliable and original educational resources. This statement from Professor 4 exemplified this theme:

> The accuracy of information in AI-generated content is a significant concern in education. While AI can automate content creation, there is a need for careful monitoring and verification to ensure the accuracy and reliability of educational materials. Educators should play an active role in reviewing and curating AI-generated content to maintain high standards of quality.

Digital Dependence

Concerns have been raised that overreliance on AI technology for learning can potentially impact students' critical thinking and problem-solving skills. Reduced analytical thinking and limited creativity may arise from excessive dependence on AI tools and automation in the educational process. This theme was supported by the following statement from Professor 11:

> The overreliance on AI technology in education may lead to reduced analytical thinking among students. When AI tools provide ready-made answers and solutions, students may become accustomed to relying on them rather than engaging in critical thinking and independent problem-solving. It is crucial to strike a balance by encouraging students to think analytically and develop their problem-solving skills alongside the use of AI technology.

Teacher Redundancy

The widespread use of AI as a replacement for human educators has raised concerns about potential reductions in the number of teaching positions, resulting in job displacement and loss of human interaction, an important aspect of the educational experience. As Professor 14 stated:

> The widespread adoption of AI in education may lead to job displacement among educators. As AI technology advances, there is a possibility that certain tasks traditionally performed by teachers could be automated. It is important to find a balance between leveraging AI for efficiency and preserving the valuable role of human educators in providing personalized instruction, mentorship, and guidance.

Technology Gaps

Unequal access to AI-integrated technology and the Internet can exacerbate educational disparities, leading to concerns about the digital divide and limited technological resources in education. This finding is consistent with the statement from Professor 9 that "unequal access to AI-integrated technology exacerbates educational disparities. The digital divide creates inequalities in educational opportunities, limiting students' ability to benefit from AI tools. Bridging this divide is essential for ensuring equitable access to AI-integrated education." Similarly, Professor 15 stated that "limited technological resources contribute to the technology gap in education. Schools with budget constraints struggle to provide AI technology, widening disparities. Allocating resources and promoting equitable access to technology is crucial for addressing this issue."

Social Isolation

The overemphasis on online education in AI-integrated learning may lead to reduced social interaction, which can have implications for students' mental health. Concerns have arisen regarding feelings of loneliness and potential mental health challenges associated with limited social connections. As Professor 14 explained.

> The overemphasis on online education can contribute to feelings of loneliness among students. The absence of face-to-face interactions and limited opportunities for socialization may lead to a sense

of isolation. It is crucial to create spaces and activities that foster social connections and promote a sense of community, even in AI-integrated educational settings.

Ethical Dilemmas

The use of AI technology in education has raised ethical questions, including concerns about algorithmic bias and the ethical use of AI. It is important to address these in order to ensure fairness and ethical decision-making in AI-integrated educational systems.

> Algorithmic bias is a significant ethical concern in AI-integrated education. AI algorithms can inadvertently perpetuate biases in areas such as grading, admissions, or resource allocation, which may result in unfair treatment or discrimination. It is crucial to develop and implement transparent and unbiased algorithms, regularly evaluate their performance, and address any instances of bias to ensure equitable educational opportunities for all students. (Professor 19)

Human-AI Interaction Challenges

The integration of AI technology in education can present challenges for students and faculty members, including difficulties in adapting to AI technology, which may result in inefficiencies and frustration. Two relevant subcategories include user resistance and training requirements.

> User resistance is a common challenge when introducing AI technology in education. Students and faculty members may initially struggle to adapt to new AI tools and processes, leading to resistance and reluctance to fully engage with the technology. It is important to address this resistance by providing clear explanations of the benefits, offering training and support, and fostering a positive learning environment that encourages exploration and experimentation. (Professor 17)

Discussion

Qualitative data analysis revealed 10 key opportunities for AI-powered technologies like ChatGPT in higher education. However, these opportunities come with their own challenges and nuances that require careful consideration. One of the most promising prospects is the potential for greater personalization in education. AI can adapt learning materials and methods to the individual needs of students, revolutionizing the educational experience. Nevertheless, we must consider the lessons learned from national programs to ensure fairness, accountability, and transparency, and to prevent bias and discrimination (Ahmad et al., 2020).

Another beneficial opportunity lies in the improved access to information enabled by AI integration. However, this wealth of online resources has also raised questions about the credibility and quality of the content. Therefore, as Mayer (2014) emphasized, it is essential to provide students with the skills to critically evaluate and recognize reliable information. Efficient feedback mechanisms enabled by AI provide real-time assessment and feedback to improve the learning process. Nevertheless, the ethical use of student data must remain a priority, in line with the findings of Ghallab (2019).

In addition, 24/7 availability through AI technology offers flexibility and convenience. However, a balance must be struck as excessive accessibility can lead to burnout and a so-called always-on culture (Mullikin, 2020). Global collaboration in education enabled by AI can also enrich the learning experience. Nevertheless, it must overcome challenges related to intercultural communication and cultural sensitivity (Gonzalez & Kasper, 1997). Incorporating the development of intercultural competencies into the educational process (Chai, Lin, et al., 2020) is a crucial step. AI-driven interactive learning is a valuable tool that can increase student engagement and motivation. However, thorough research is needed to assess the impact on learning outcomes (Holstein et al., 2018). It is important to ensure that gamification serves the larger educational goals. Low-cost education enabled by AI is a huge opportunity. Nevertheless, careful consideration of financing models and long-term sustainability is required. The challenge is to provide quality education at a lower cost without compromising on quality.

Although AI has clearly played a role in facilitating distance learning, it also needs to address the digital divide and guarantee fair access to technology (Karnouskos, 2022). One of the main objectives is to close the gap between urban and rural areas (Samuel, 2021). The potential for data-driven insights to improve instruction means they should be applied carefully and with a view toward enhancing the learning process for students (Samuel et al. 2022). Educational objectives must be in line with data analytics. Finally, there is an urgent need to prepare students for the labor market of the future. But in addition to technical skills, this preparation should cover social, emotional, and ethical competencies as well (Mishra & Koehler, 2006).

The goal is to create well-rounded people who are prepared for a complicated world—which is undoubtedly a complex challenge. In conclusion, there are many benefits to integrating AI into education; however, for this to happen, ethical, pedagogical, and practical issues must be considered. Proactively tackling these obstacles is necessary to fully realize the benefits of artificial intelligence in higher education, minimize possible hazards, and guarantee optimal learning results.

The second research question, which delved into the perceived threats of AI-integrated technology like ChatGPT in higher education from the perspective of educational technologists, unearthed a complex landscape of concerns. Thematic analysis of interviews with 20 educational technologists revealed eight central themes, each comprising multiple sub-categories, offering a comprehensive picture of the multifaceted challenges that surround AI's role in education.

Privacy concerns emerged as a prominent theme, emphasizing the paramount importance of safeguarding students' personal data and privacy. With educational institutions increasingly collecting and analyzing student data, robust measures like encryption protocols, secure storage systems, and strict access controls become essential to prevent data breaches and unauthorized access. Ahmad et al. (2020) articulated, "privacy concerns arise with the use of AI-integrated technology in education, specifically regarding data security" (p. 4). To address these concerns, transparency, explicit consent, and clear guidelines for data collection and usage must be established. Balancing between leveraging AI for educational purposes and preserving students' privacy rights is essential (Baker et al, 2019).

The second theme related to perceived threats, namely quality of content, was concerned with the authenticity and dependability of educational materials produced by AI. To maintain high standards of quality, concerns regarding the integrity of the information in such content highlighted the necessity for

meticulous monitoring and verification. Educators should take an active role in reviewing and selecting AI-generated content. This theme also raised the possibility of plagiarism resulting from AI's ability to generate text. This issue emphasizes the importance of upholding academic integrity and using plagiarism detection software (Mayer, 2014).

The topic of digital dependency highlighted the risks of over-reliance on AI technology for learning. Overdependence can lead to reduced analytical thinking and hinder students' creativity. Encouraging students to think analytically and develop problem-solving skills alongside AI is essential (Holstein et al., 2018). Teacher redundancy, the fourth theme from our second research question, raised concerns about AI's possible replacement of human educators. While AI can automate specific tasks, it cannot replace the unique value that human educators bring to education, such as personalized instruction, mentoring, and guidance. Preserving these irreplaceable human qualities is critical to complement AI technology effectively.

Technology gaps, the fifth theme among the threats raised by participants, highlighted the inequalities that different levels of access to AI-integrated technology and the Internet can cause in education. Bridging these differences will be critical to ensuring that all students have equal access to AI tools (Wilson & Gruzd, 2014). Social isolation, the sixth theme, encompassed concerns arising from an overemphasis on online education through AI-integrated learning. Such an emphasis may reduce student social interactions and lead to mental health impacts. To address these concerns, it is essential to create spaces and activities that promote social connections and a sense of community (Roper, 2007).

Ethical dilemmas formed the seventh theme, encompassing concerns regarding algorithmic bias and the ethical use of AI in education. Algorithmic bias can lead to unfair treatment or discrimination in grading, admissions, or resource allocation. To counteract these biases, transparent and unbiased algorithms and regular performance evaluations are crucial (Ghallab, 2019).

Human-AI interaction challenges encompassed the issues faced by students and faculty members when adapting to AI technology. These challenges have often resulted in resistance and inefficiencies. Overcoming user resistance involves providing clear explanations and training, as well as cultivating a positive learning environment. Proper training through ongoing professional development programs is vital for effective human-AI interaction (Martin et al., 2020).

Conclusions and Implications

In summary, the integration of AI in education presents numerous opportunities but also demands proactive addressing of ethical, pedagogical, and practical considerations to unlock its full potential and ensure the best possible learning outcomes. Key opportunities include (a) enhanced personalization, (b) increased access to information, (c) efficient feedback mechanisms, (d) 24/7 accessibility, (e) global collaboration, (f) interactive learning, (g) cost-effective education, (h) bridging the digital divide, (i) leveraging data insights, and (j) preparing students for the future job market. However, these opportunities come with challenges, such as (a) ensuring fairness, (b) maintaining content quality, (c) ethical use of

student data, (d) preventing burnout, (e) considering cross-cultural communication, (f) aligning data analytics with educational goals, and (g) developing well-rounded individuals.

Exploring threats associated with AI-integrated technology in higher education has unearthed a complex landscape of concerns. Privacy concerns emphasize the need to safeguard student data and privacy through encryption and strict access controls. Ensuring transparency and explicit consent is crucial. Quality of content raises worries about the accuracy and potential plagiarism in AI-generated educational materials, highlighting the importance of promoting academic integrity. Digital dependence underscores the risk of overreliance on AI, which may hinder analytical thinking and creativity, necessitating a balance. Teacher redundancy raises concerns about the possible replacement of human educators, emphasizing the unique value they bring to education. Technology gaps underscore inequalities in access, highlighting the need to bridge disparities. Social isolation reveals concerns about reduced social interaction and potential mental health implications, emphasizing the importance of fostering a sense of community. Ethical dilemmas encompass issues of algorithmic bias and ethical AI use, necessitating transparent and unbiased algorithms and ethical guidelines. Finally, human-AI interaction challenges encompass the difficulties faced by students and faculty members when adapting to AI technology and emphasize the need for proper training and a positive learning environment.

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