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CHATGPT: TRANSFORMING EDUCATION AND HEALTHCARE LANDSCAPES

CHATGPT: TRANSFORMANDO CENÁRIOS DE EDUCAÇÃO E SAÚDE

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ABSTRACT: AI, including ChatGPT, has experienced significant growth and widespread adoption across various sectors such as medicine, agriculture, finance, and education. In healthcare, AI algorithms play a crucial role in medical diagnostics, cancer detection, and drug development, leading to advancements in autonomous diagnostic tools. This study focuses on exploring the use of ChatGPT in education, particularly in health-related applications, as it becomes increasingly integrated into academic environments. Additionally, it critically evaluates its use in semi-academic contexts, examining its implications. Classified as exploratory research, the study aims to provide comprehensive insights by analyzing articles published in the past five years. The selected works were reviewed using predefined inclusion and exclusion criteria to curate texts for the study. ChatGPT demonstrates significant potential in education and medical sciences, with applications such as research enhancement, text correction, language learning, streamlining tasks, and saving time. In healthcare, digital interfaces are emerging as viable alternatives to make psychiatric diagnosis and treatment more accessible and affordable, offering support and therapy. However, these tools cannot yet reliably diagnose mental health conditions or provide detailed treatment plans. Therefore, ChatGPT should be seen as a complementary tool, not a replacement for human capabilities.
Keywords: artificial intelligence; health education; technology; machine learning.

RESUMO: *A inteligência artificial (IA), incluindo o ChatGPT, tem experimentado um crescimento significativo e uma adoção generalizada em diversos setores, como medicina, agricultura, finanças e educação. Na área da saúde, algoritmos de IA desempenham um papel crucial em tarefas como diagnóstico médico, detecção de câncer e desenvolvimento de medicamentos, levando a avanços em ferramentas de diagnóstico autônomas. Este estudo foca em explorar a utilização do ChatGPT na educação, particularmente em aplicações na área da saúde, à medida que ele se integra cada vez mais em ambientes acadêmicos. Além disso, avalia criticamente seu uso em contextos semiacadêmicos, examinando suas implicações. Classificado como pesquisa exploratória, este estudo visa fornecer insights abrangentes, analisando artigos publicados nos últimos cinco anos. As obras escolhidas foram examinadas, empregando critérios pré-definidos de inclusão e exclusão para curadoria de textos para o estudo. O ChatGPT demonstra grande potencial na educação e nas ciências médicas, com aplicações como aprimoramento de pesquisas, correção de textos e aprendizado de idiomas, otimizando tarefas e economizando tempo. No campo da saúde, interfaces digitais estão surgindo como alternativas viáveis para tornar o diagnóstico e tratamento psiquiátrico mais acessíveis e econômicos, oferecendo suporte e terapia. No entanto, essas ferramentas ainda não podem diagnosticar com precisão condições de saúde mental ou fornecer tratamentos detalhados. Portanto, o ChatGPT deve ser visto como uma ferramenta complementar e não como substituta das capacidades humanas.*
Palavras-chave: inteligência artificial; educação em Saúde; tecnologia; aprendizado automático.

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INTRODUCTION

Artificial intelligence (AI) has advanced significantly over the years, being utilized in various fields of knowledge such as medicine, agriculture, finance, and education (Zhang; Lu, 2021). Its development has brought substantial economic benefits and positively impacted all aspects of life, driving social progress and marking a new era of development (Lu; Xu, 2018). It promotes a symbiosis between humans and machines, reflected in systems like brain prosthetics and human-machine interactions, as seen in applications and AI algorithms (Kaufman, 2019).

The relationship between humans and algorithms has led to the creation of various tools, with one of the most widely used today being ChatGPT, or "Generative Pre-Trained Transformer". This AI feeds on the internet, a vast database, and utilizes a cross-referencing of information to transform questions into answers. It is capable of producing creative, contextualized responses, and crafting texts similar to humans. It is considered an AI-driven tool. Studies indicate that AI plays an indispensable role in social development, bringing revolutionary results in improving work efficiency, reducing labor costs, optimizing human resource structures, and creating new job demands (Zhang; Lu, 2021; Aripin *et al.*, 2024).

ChatGPT, an AI-based chatbot from OpenAI, gained prominence in 2022 by becoming free to use, attracting over a million users in less than a week (Cotton *et al.*, 2024). With over 100 million users, it stands as one of the largest language models available, capable of performing various linguistic tasks such as translation and text generation. This is a multidisciplinary technology integrating cognition, machine learning, and emotion recognition, serving as an important development strategy for countries worldwide, enhancing competitiveness and security (Rajkomar *et al.*, 2018; Lu, 2019).

In the healthcare sector, AI algorithms are employed for medical assistance, cancer detection, and new drug development (Ravi *et al.*, 2016). AI's influence on daily life and digital healthcare for disease diagnosis and treatment is progressively strengthening (Iqbal *et al.*, 2021). This trend drives the advancement of autonomous diagnostic tools, utilizing extensive datasets to address future challenges in early disease detection, particularly cancer (Bhunder *et al.*, 2021). The potential of machine intelligence may soon surpass that of humans (Zhang; Lu, 2021).

A prominent example of AI's application in healthcare is demonstrated in a study conducted by Ramos (2023). Amidst the COVID-19 pandemic, the focus was on diagnosis. Utilizing the PRISMA tool, there was a significant reduction in the time required for research and diagnosis, leveraging a database. This progress led to the development of a new treatment management system, patient care, and quicker decision-making to mitigate challenges posed by the disease. The article also scrutinizes a new tool, ChatGPT, through a literature review, investigating ethical and moral principles, as well as its applicability in academia.

This study investigates the utilization of ChatGPT in educational contexts, particularly in healthcare, given its growing academic adoption. The substantial increase in its use raises concerns about its unregulated implementation in educational settings. The article explores ChatGPT's applications in academia, identifying its various utilities and analyzing the ethical and moral principles involved. Additionally, it critically evaluates its use in semi-academic contexts, examining its implications. The article's objectives are clearly outlined, addressing ChatGPT's application in education and its ethical and practical implications. Furthermore, it is part of the study area of the Center for Advanced Morphophysiological Studies at UEMASUL.

THEORETICAL REFERENCE

In this section, we will address essential concepts that constitute the theoretical foundation of the proposal, highlighting the term "Artificial Intelligence" (AI), the use of chatGPT, and chatGPT in education and healthcare.

Artificial intelligence

The term AI originated in the mid-1950s concurrent with the inception of early programming languages. This marked the introduction of a transformative tool that reshaped the world, ushering in a plethora of possibilities for its integration into modern-day living.

Silva and Mairink's work provides a lucid and succinct elucidation of the AI concept.

> AI constitutes a field of science striving to replicate human intelligence through technological methods. Its objective encompasses problem-solving, solution generation, and even decision-making instead of human involvement. This AI assistance holds the potential to enhance various domains of daily existence (Silva; Mairink, 2019).

According to Moscove (2002), artificial intelligence encompasses a collection of tasks aimed at facilitating problem-solving.

> Artificial Intelligence addresses a range of tasks, encompassing those that are general, structured, and specialized. Various categories of AI comprise robotics, visual and auditory perception, natural language comprehension, as well as problem-solving systems like expert systems, neural networks, and case-based reasoning systems (Moscove, 2002).

As per Kaufman (2019), artificial intelligence is intertwined with various knowledge domains that pertain to language and

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comprehension. It embodies a symbiotic relationship between humans and machines, leading to the creation of artificial intelligence systems that are integrated with the human body, such as brain prostheses, bionic limbs, and artificial cells. This dynamic extends to the interaction between humans and machines, encompassing distinct yet interconnected relationships: human-application and human-AI algorithm interfaces.

In recent times, significant strides have been made in the integration of AI within education. These advancements have catalyzed substantial transformations in the approaches to both teaching and learning. Vicari's work (2018) specifically documents the application of this technology in educational contexts.

> The incorporation of technologies within educational institutions is closely intertwined with three distinct technological landscapes that form the foundation of AI. This collective transformation has fundamentally altered the landscape of educational technology utilization, primarily driven by the proliferation of wireless networks (Wi-Fi internet), the prevalence of mobile technologies (such as smartphones and tablets), and the advent of cloud-based content storage. These elements collectively shape the trajectory of AI, resulting in the emergence of novel technologies like Learning Analytics, Big Data utilization, and the capability to train Machine Learning Algorithms using substantial datasets (Vicari, 2018).

These transformative attributes have led to significant advancements in the realm of teaching and learning, providing avenues for redefining contemporary pedagogical practices.

The use of chatGPT

These interactions between humans and algorithms have spurred the development of numerous tools, one of which has gained substantial traction today known as ChatGPT, short for "*Generative Pre-Trained Transformer*". This artificial intelligence leverages a vast online database, amalgamating diverse information to convert queries into outcomes. It possesses the ability to craft imaginative responses, contextualize information, and even generate text resembling human composition. Regarded as a product of AI, ChatGPT serves as a tool that embodies this technological innovation (Javaid *et al.*, 2023).

In 2022, this innovative tool garnered significant attention in the realm of influential media. Its newfound accessibility, offered for free, facilitated widespread adoption, resulting in an impressive surge of over one million users within a mere week (Cotton *et al.*, 2024). This tool stands as one of the most expansive language models accessible, showcasing its prowess in executing a diverse array of linguistic tasks. Its capabilities span translation, summarization, question-and-answer interactions, as well as text generation.

According to Gualberto (2023), this innovation holds the potential to reshape the future by harnessing advanced technology, signifying a promising force that can revolutionize what lies ahead.

> ChatGPT stands as a substantial leap in the arena of chatbots and artificial intelligence. It introduces a fresh mode of interaction and communication bridging the gap between humans and machines. This transformation holds the potential to reshape how companies and organizations engage with their customers and users, fueled by its encompassing linguistic comprehension skills. Notably versatile, it possesses a general-purpose linguistic understanding capacity and offers the promise of tailored adjustments. ChatGPT emerges as a technology-laden with potential, poised to redefine the landscape of digital conversations and potentially revolutionize their trajectory in the future (Gualberto, 2023).

An exemplary instance showcasing the utility of this technology for the betterment of human welfare is provided by Quispe-juli (2023) in his study focusing on pediatric diagnosis.

> AI language models, such as ChatGPT, possess the capacity to reconfigure formal, organized, and rapidly accessible medical information. These models are capable of crafting clinical scenarios, proposing relevant medical literature, or even inquiring about health-related subjects. Moreover, current capabilities extend to generating images using AI, which can yield artistic or educational value (Quispe-juli, 2023).

Another notable application resides within the realm of agriculture, where the utilization of ChatGPT emerges as a tool of significant value, particularly in aspects like crop cultivation, pest management, and various other functions.

> ChatGPT can undergo training using extensive volumes of agricultural data encompassing details about soil quality, meteorological patterns, and strategies for pest management. This capability empowers the technology to offer farmers customized suggestions and counsel for enhancing their crop yields. Specifically, ChatGPT can be trained to identify the precise soil composition and climatic conditions pertinent to a specific farm. Consequently, it can furnish tailored recommendations concerning the most appropriate crops for that specific agricultural setting, factoring in elements like soil nutrient content and localized weather dynamics (Agtecher, 2022).

ChatGPT and education

ChatGPT has emerged as a culmination of numerous years of research centered around artificial intelligence, dedicated to proficiently responding to an extensive array of inquiries presented in natural language (Monteiro, 2023). Pedagogical knowledge construction involves nurturing the development of reasoning through the enhancement of an individual's skills

and capabilities. The incorporation of AI has introduced a distinctive paradigm for generating knowledge, as underscored by an IFSC publication (2023).

> Artificial Intelligence (AI) is orchestrating a substantial transformation within the domain of education. It plays a pivotal role in tailoring teaching methods, delivering prompt feedback to students, and enhancing the measurement of progress. Furthermore, AI streamlines teaching by automating repetitive tasks, thereby affording educators more time to concentrate on catering to the unique needs of each student. An added benefit of AI is its ability to enhance inclusivity by granting students with special needs or learning challenges access to educational materials and resources. However, it is imperative to undertake measures to guarantee the responsible and ethical implementation of AI in educational contexts (IFSC, 2023).

Despite the remarkable progression of this tool, a notable apprehension arises regarding its potential utilization for disseminating inaccurate information lacking a scientific foundation. The emergence and evolution of ChatGPT has engendered a certain level of controversy due to its association with skepticism and concerns about misuse. This matter serves as a gateway to a broader discourse concerning the utilization of this tool, encompassing not just education but also all knowledge-centric systems. The study by Monteiro (2023) delves into the primary ethical concerns that warrant consideration in this context.

> 1. Data Privacy and Security: The operation of ChatGPT hinges on data, and the process of collecting, storing, and utilizing this data can potentially raise ethical apprehensions, particularly concerning the privacy and security of student information. It is imperative to guarantee the safeguarding of student data and its ethical and transparent utilization.
>
> 2. Biases and Stereotypes: ChatGPT's training relies on substantial datasets, which may inherently include biases and stereotypes that could be replicated by the model. It is critical to ensure that the training data for ChatGPT is comprehensive and inclusive, encompassing a diverse range of perspectives. This practice is essential to prevent the perpetuation of stereotypes and biases within the system.
>
> 3. Accountability and Transparency: The intricacies of ChatGPT as a technology can render it opaque, making it challenging to grasp the mechanisms guiding its decision-making and responses. It is crucial to enforce transparency among companies and institutions employing ChatGPT, how the technology is employed, and hold them accountable for the decisions the model generates.
>
> 4. Dependency on Technology: While ChatGPT offers substantial benefits for education, it also bears the potential risk of fostering excessive reliance on technology. Ensuring that the use of ChatGPT is supplementary rather than a replacement for teaching and human interaction is vital (Monteiro, 2023).

ChatGPT and healthcare

Artificial intelligence holds the potential to revolutionize healthcare research and practice by opening up new avenues and exploring uncharted territories. Cabitza *et al.* (2018) demonstrated a significant increase in the use of AI in Orthopaedics, with a nearly tenfold rise since 2010. Their study revealed that AI was primarily utilized for diagnostic purposes, such as predicting or detecting osteoarthritis and analyzing imaging related to joints, bones, and spine pathology. Additionally, Fayed *et al.* (2023) presented various examples of AI applications across several orthopedic sub-specialties, including fracture detection and prediction, osteoarthritis and arthroplasty, spine surgery, and foot and ankle surgery.

After assessing AI's capabilities across various fields, healthcare professionals can begin customizing this new technology to optimize its utility within their scope of practice. According to Ravi *et al.* (2016), in domains like health informatics, the automatic generation of feature sets without human intervention offers numerous advantages. Furthermore, in the realm of bioinformatics, the objective is to delve into and comprehend biological processes at a molecular level, to predict and prevent diseases through the development of more efficient and personalized treatments, involving patients in the process.

One of the major challenges in computer-aided diagnosis is the variability in the shape and intensity of tumors or lesions, as well as differences in imaging protocols even within the same modality (Lemaître *et al.*, 2015; Salvi *et al.*, 2024). Consequently, diagnosis relying solely on image interpretation can be highly subjective. Hence, automatic medical imaging analysis plays a crucial role in modern medicine. For example, Zhang *et al.* (2024) established the application of 3D Slicer as an important medical image analysis platform in the medical field. Their research highlights its potential for applications in medical imaging education, such as image segmentation and reconstruction, computer-aided diagnosis and research, and quantitative analysis of medical imaging.

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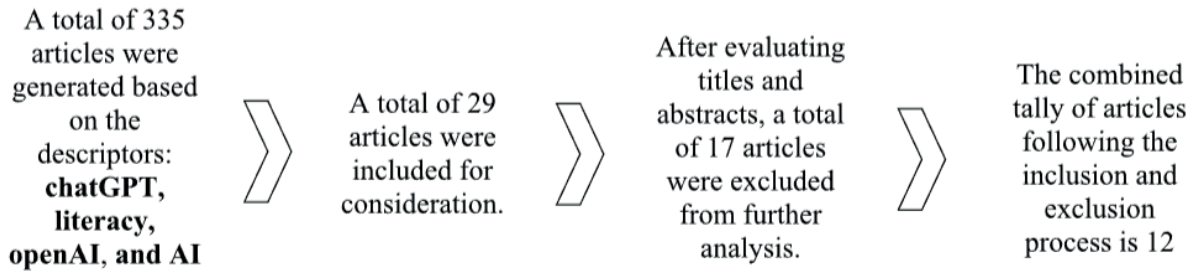
MATERIAL AND METHODS

This study is categorized as exploratory research, as its primary aim was to offer a comprehensive insight into the subject matter. Upon selecting the topic, information gathering was conducted through secondary sources, primarily scientific articles. Google Scholar served as the research platform, facilitating the compilation of a global representation of research on chatGPT's usage.

To compile the production indices, the research platform employed specific keywords: "chatGPT," "literacy," "openAI," and "AI." The objective was to encompass articles published within the last five years (Figure 1). The identified material was saved electronically and organized, with a focus on selecting those that featured insights on the utilization of the chatGPT tool.

Figure 1 – Flowchart outlining the article selection process for the systematic review



Source: prepared by the authors based on research data.

Following this initial step, the chosen works were perused, employing predefined criteria for inclusion and exclusion to curate texts for the study (Table 1). From this pool, only a subset was chosen for the subsequent analysis, post-application of the inclusion and exclusion criteria. After data compilation, the analysis *corpus* was characterized, involving the categorization and segregation of content similarity, culminating in the identification of three distinct categories.

Table 1 – Criteria for Inclusion and Exclusion

Criteria for exclusion	Criteria for inclusion
1. Texts published before 2018 were excluded. 2. HTML texts (such as blogs) were not considered. 3. Restricted access materials were omitted. 4. Studies with subjects unrelated to the researched terms (chatGPT, literacy, openAI, AI) and those not applicable within the context of Brazil were excluded.	1. Only comprehensive scientific articles were considered. 2. Articles had to provide an account of the utilization of chatGPT. 3. Studies within the last 5 years were included.

Source: authors.

RESULTS

Numerous articles were scrutinized, with a specific focus on ChatGPT's application in education. Notably, a surge in scientific and technical studies concerning the possibilities and anticipated benefits of this tool has emerged within the last six months. The findings yielded a total of 12 articles, systematically categorized to facilitate comprehension and insight. To enhance clarity, the references discovered have been provided.

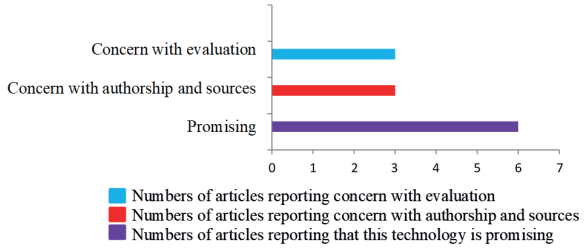
The initial category, labeled "Promising Characteristics," encompasses six articles (Ali *et al.*, 2023; García-Penãlvo, 2023; Mhlanga *et al.*, 2023; Qquispe-juli *et al.*, 2023; Cotton *et al.*, 2024; Megahed *et al.*, 2024). For instance, Ali *et al.* (2023) study investigates ChatGPT's influence on English language education, noting its positive impact on students' macro and micro language skills. This technological innovation is observed to integrate seamlessly into daily educational routines, aiding in diverse tasks such as activity creation, translations, essay generation, and utilization within language models. Despite its relatively brief tenure under study, ChatGPT's merits are conspicuously evident across various research works. It emerges as a promising AI tool capable of facilitating tasks, propagating knowledge, and spearheading research endeavors, thus enabling its diffusion across the global educational landscape.

AI also initiates discussions around issues like authorship and source credibility, which emerge in three distinct studies (Halaweh, 2023; Lund; Agbaji, 2023; Rudolph *et al.*, 2023). In his study on the integration of AI in health education, Sallam (2023) emphasizes that while its application spans education, practical research, and healthcare, certain shortcomings and legitimate concerns exist. These concerns primarily relate to potential misuse, particularly within education, encompassing challenges like subpar quality texts and a dearth of pertinent data. Similar concerns are mirrored in the realms of healthcare research and practice. In response, Sallam underscores the need for imperative guidelines and regulations. Engaging all stakeholders is crucial to ensure the safe and responsible harnessing of ChatGPT's potential and that of other Language Models.

Another noteworthy issue raised in three studies (Islam; Islam, 2023; Kasneci *et al.*, 2023; Sallam, 2023) pertains to the delegation of tasks within the academic environment. This concern surfaces when deliberating the intent behind adopting this tool. Rudolph *et al.* (2023) delve into this matter within the context of current Artificial Intelligence in Education (AIED). Their study examines the student-centric, teacher-centric, and system-centric applications, dissecting potential opportunities and threats. Notably, they discuss the evolution of conventional higher education assessment methods like essays and online examinations. Considering the advancing landscape, the need to accommodate contemporary changes is underscored, suggesting shifts toward guided assessments for both students and educators.

While examining the research, a recurring concern arises regarding the validation of learning outcomes. It's worth noting that the analyzed articles cover both English and Spanish languages due to the limited academic output related to this subject in Brazil. Overall, it's evident that this technology serves as a ubiquitous tool in everyday education: in activity creation, translations, essay writing, and language model utilization, among other applications. However, this AI also exhibits shortcomings such as issues with authorship and sources, as well as generating text lacking credibility. Moreover, the outsourcing of activities in academia is a notable concern, as highlighted in the analyzed scientific articles. Upon reviewing the research findings, both positive and negative aspects emerge, indicating that this tool possesses visionary and promising qualities (Figure 2).

Figure 2 – Analysis of selected articles after reading and application of inclusion and exclusion criteria



Source: prepared by the authors based on research data.

DISCUSSION

The ascendancy of chatGPT and its continuous enhancements are garnering significant attention due to their expeditious integration within the educational realm. As foreshadowed by Lévy (1996, p. 7), he foresaw that "[...] in the current era, the technique is one of the fundamental dimensions where the transformation of the human world is at stake." In essence, Lévy anticipated the role of technology in shaping the contemporary landscape, asserting that new knowledge prompts educators to embrace uncertainty and remain receptive to technological shifts.

Considering these transformative shifts, the emergence of chatGPT stands as an artificial intelligence revolution. Its presence bears the potential to either accelerate or decelerate the learning process, effectively becoming a determining factor. Numerous articles were meticulously examined, with a predominant focus on ChatGPT's role in education. Notably, over the past six months, there has been a discernible surge in scientific and technical studies exploring the potential and anticipations associated with this tool.

On a favorable note, these studies underscore that this technology constitutes a significant stride within the technological landscape. It is particularly recognized for its capacity to yield high-quality texts and facilitate translations across multiple languages. Moreover, this innovation is poised to yield substantial advancements in teaching methodologies. This optimistic outlook on chatGPT underscores its versatile utility across various domains. Irigaray (2023) asserts that leveraging this tool streamlines tasks like text creation, revision, and editing, significantly conserving time and effort. Notably, chatGPT exhibits an innovative functionality that extends beyond mere mechanical operations, transforming into an artificial intelligence entity proficient in both composition and human-like dialogue.

The scope of this tool's application spans numerous fields of knowledge, encompassing healthcare for prescribing medical treatments, simplifying tasks within the legal domain, and functioning as a language model. However, this multifaceted utility gives rise to concerns about authorship and the sources integrated into the AI's database. Velásquez (2023) highlights that when ChatGPT is employed as an analytical and writing tool, it introduces ethical quandaries related to authorship. Given that the tool doesn't attribute sources and authors, it triggers discussions about plagiarism—a dilemma evident in several articles. These discussions underscore a perceived lack of autonomy and accountability within this technology, consequently engendering questions about its credibility in generating content.

The apprehension surrounding technology's impact has been a subject of discourse since the inception of the first electronic devices. Freire (1968) posits that technology isn't the product of malevolent forces; rather, it's a manifestation of human innovation. According to Freire, technologies are inherent to the

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natural progression of each individual and society. Consequently, the onus of responsibility rests with humanity when evaluating information and the potential application of chatGPT, a technology that can exceed the confines of human reasoning.

At present, the substantial potential of chatGPT commands considerable attention, and extensive analysis has been directed toward its significant capabilities. However, a noteworthy apprehension surrounds this technology – the potential repercussions of its unchecked usage without scientific responsibility. The consequences could encompass a range of issues affecting global populations. Notably, concerns loom over unemployment, given that AI could progressively undertake human production tasks. Moreover, the ramifications could extend to influencing the economies of multiple nations and exacerbating technological disparities.

ChatGPT's role in education encapsulates the trajectory of technological advancement, where its refinement and user-friendly interface trigger a sense of unease within the realm of learning. Zhai (2022) and Silva *et al.* (2023a) accentuates this unease by pointing out the potential for students to outsource assessment tasks, echoing concerns about academic integrity. Amidst the technological advantages, there also loom certain drawbacks. An emerging concern is the potential erosion of genuine learning experiences and critical thinking abilities (Fernandes *et al.*, 2024). This is particularly evident in activities such as research and the production of academic texts. Such drawbacks could impede students' learning journeys at all educational levels, spanning from elementary to higher education.

This technology, adept at text transcription, has unlocked its potential within education across various knowledge domains. Particularly noteworthy is its integration into academic endeavors, spanning diverse fields such as law, medicine, marketing, and geology. Regulations such as Brazil's AI Law No. 21/2020 emphasize the priority of human rights and data privacy, which are essential for balanced AI advancement (BRASIL, 2020). However, the embracement of this technology isn't universal and is contingent upon the scientific community's willingness to initiate a dialogue. This discussion pertains to a quandary that resonates with all researchers who collectively contribute to the advancement of knowledge.

The tool, in its outcomes, may exhibit transcription characterized by biased interpretations, restricted context, inaccuracies, and a lack of consciousness. Velásquez (2023) elaborates that utilizing ChatGPT also gives rise to a spectrum of significant ethical concerns demanding thoughtful consideration and resolution. It holds paramount importance to ascertain that this technology is harnessed responsibly and ethically, thereby optimizing its advantages and mitigating the risks and potential adverse outcomes.

In summary, ChatGPT has broad applications in education and medical science, showing significant potential across various fields, including mental health (Singh, 2024). However, its application in medical analysis demands strict data security measures due to the handling of personal medical histories and sensitive patient information. According to Mu and He (2024), ChatGPT can offer relatively accurate diagnoses and medical advice, serving as a powerful auxiliary tool for decision-making, drafting medical documents, medical education, and scientific research acceleration.

In this scenario, AI and digital interfaces are emerging as viable alternatives for bridging the gap and making psychiatric diagnosis and treatment more accessible and affordable (Balcombe; De Leo, 2021). ChatGPT and other AI-based chatbots can generate responses of human quality, offering companionship, support, and therapy to individuals facing challenges related to accessibility and affordability in terms of time, distance, and finances. However, they cannot currently reliably and accurately diagnose specific mental health conditions or provide detailed treatment information (Silva *et al.*, 2023b; Singh, 2024). Additionally, ChatGPT currently lacks optimization in this area, which may pose risks of data leaks and privacy breaches.

CONSIDERATIONS

ChatGPT shows significant potential in education and medical sciences, with notable applications in various fields, including mental health. Its capabilities include enhancing research, simplifying text correction, and aiding language learning. While its simplicity is appealing, concerns about data authenticity and privacy persist. It's crucial to view ChatGPT as a supplementary tool rather than a replacement for human capabilities.

Regulatory frameworks like Brazil's AI Law No. 21/2020 prioritize human rights and data privacy, essential for balanced AI progress. Despite requiring strict data security measures in medical analysis, ChatGPT shows promise in offering relatively accurate diagnoses and medical advice. However, optimization is needed to address data privacy risks. As AI and digital interfaces become more prevalent, they offer a promising avenue for improving accessibility in psychiatric diagnosis and treatment.

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REFERENCES

ALI, J. K. M.; SHAMSAN, M. A. A.; HEZAM, T. A.; MOHAMMED, A. A. Impact of ChatGPT on learning motivation: teachers and students' voices. **Journal of English Studies in Arabia Felix**, v. 2, n. 1, p. 41-49, 2023. DOI: https://doi.org/10.56540/jesaf.v2i1.51

AGTECHER. **How OpenAI and ChatGPT can be used in Agriculture**. 2022. Available in: https://agtecher.com/es/how-openai-and-chatgpt-can-be-used-in-agriculture/ (Accessed May 10, 2024).

ARIPIN, Z.; MATRIADI, F.; ERMEILA, S. Optimization of worker work environment, robots, and marketing strategy: the impact of digital-based spatiotemporal dynamics on human resource management (HRM). **Journal of Jabar Economic Society Networking Forum**, v. 1, n. 3, p. 33-49, 2024. Available in: https://jesocin.com/index.php/jesocin/article/view/15 (Accessed May 10, 2024).

BALCOMBE, L.; DE LEO, D. Digital mental health challenges and the horizon ahead for solutions. **JMIR Mental Health**, v. 8, n. 3, e26811, 2021. DOI: https://doi.org/10.2196/26811

BHINDER, B.; GILVARY, C.; MADHUKAR, N. S.; ELEMENTO, O. Artificial intelligence in cancer research and precision medicine. **Cancer discovery**, v. 11, n. 4, p. 900-915, 2021. DOI: https://doi.org/10.1158/2159-8290.CD-21-0090

BRASIL. Câmara dos Deputados. Projeto de Lei no 21, de 2020. Brasília, DF: Câmara dos Deputados, 2020. Available in: https://www.camara.leg.br/propostas-legislativas/2236340 (Accessed May 10, 2024).

CABITZA F.; LOCORO, A.; BANF, G. Machine learning in orthopedics: a literature review. **Front Bioeng Biotechnol**, v. 6, p. 75, 2018. DOI: https://doi.org/10.3389/fbioe.2018.00075

COTTON, D. R.; COTTON, P. A.; SHIPWAY, J.R. Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. **Innovations in Education and Teaching International**, v. 61, n. 2, p. 228-239, 2024. DOI: https://doi.org/10.1080/14703297.2023.2190148

FAYED, A. M.; MANSUR, N. S. B.; DE CARVALHO, K. A.; BEHRENS, A.; D'HOOGHE, P.; CESAR NETTO, C. Artificial intelligence and ChatGPT in Orthopaedics and sports medicine. **Journal of Experimental Orthopaedics**, v. 10, n. 1, p. 74, 2023. DOI: https://doi.org/10.1186/s40634-023-00642-8.

FERNANDES, C. D.; BEZERRA, C. A. M.; AQUINO, S. C. S.; VIANA, D. C. (2024). Uso das tecnologias da informação e comunicação (TICs) como metodologia complementar no ambiente acadêmico. Práticas Educativas, **Memórias e Oralidades-Rev. Pemo**, v. 6, n. e11078, p. 1-17, 2024. DOI: https://doi.org/10.47149/pemo.v6.e11078

FREIRE, P. **Ação cultural: Para a liberdade e outros escritos.** Editora Paz e terra, 2014.

GARCÍA-PEÑALVO, F. J. The perception of Artificial Intelligence in educational contexts after the launch of ChatGPT: Disruption or Panic?. 2023. DOI: https://doi.org/10.14201/eks.31279

GUALBERTO, R. **ChatGPT Direto ao Ponto: Como dominar o prompt de maneira eficaz.** RENATO GUALBERTO SILVA, 2023.

HALAWEH, M. ChatGPT in education: Strategies for responsible implementation. **Contemporary Educational Technology,** v. 15, 2023.

IQBAL, M. J.; JAVED, Z.; SADIA, H.; QURESHI, I. A.; IRSHAD, A.; AHMED, R.; SHARIFI-RAD, J. Clinical applications of artificial intelligence and machine learning in cancer diagnosis: looking into the future. **Cancer cell international**, v. 21, n. 1, p. 270, 2021. DOI: https://doi.org/10.1186/s12935-021-01981-1

IRIGARAY, H. A. R.; STOCKER, F. (Eds.). ChatGPT: um museu de grandes novidades. **Cadernos EBAPE**, v. 21, n. 1, e88776, 2023. DOI: https://doi.org/10.1590/1679-395188776

ISLAM, I.; ISLAM, M. N. **Opportunities and challenges of ChatGPT in academia: A conceptual analysis**. Authorea Preprints., 2023. DOI: https://doi.org/10.22541/au.167712329.97543109/v1

JAVAID, M.; HALEEM, A.; SINGH, R. P.; KHAN, S.; KHAN, I. H. Unlocking the opportunities through ChatGPT Tool towards ameliorating the education system. **Bench Council Transactions on Benchmarks, Standards and Evaluations**, v. 3, n. 2, p. 100115, 2023. DOI: https://doi.org/10.1016/j.tbench.2023.100115

KASNECI, E.; SEßLER, K.; KÜCHEMANN, S.; BANNERT, M.; DEMENTIEVA, D.; FISCHER, F.; ... & KASNECI, G. ChatGPT for good? On opportunities and challenges of large language models for education. **Learning and individual differences**, v. 103, p. 102274, 2023. DOI: https://doi.org/10.1016/j.lindif.2023.102274

KAUFMAN, D. **A inteligência artificial irá suplantar a inteligência humana?.** Estação das letras e cores EDI, 2019.

ISSN 2238-5630
Brasília-DF, v. 14, n. 1, janeiro-abril de 2025

LEMAÎTRE, G.; MARTÍ, R.; FREIXENET, J.; VILANOVA, J.C.; WALKER, P.M.; & MERIAUDEAU, F. Computer-aided detection and diagnosis for prostate cancer based on mono and multi-parametric MRI: a review. **Computers in biology and medicine**, v. 60, p. 8-31, 2015. DOI: https://doi.org/10.1016/j.compbiomed.2015.02.009

LÉVY, P. **O Que É Virtual**. São Paulo: Editora 34, 1996.

LU, Y. Artificial intelligence: a survey on evolution, models, applications and future trends. **Journal of Management Analytics**, v. 6, n. 1, p. 1-29, 2019. DOI: https://doi.org/10.1080/23270012.2019.1570365

LU, Y.; DA XU, L. Internet of Things (IoT) cybersecurity research: A review of current research topics. **IEEE Internet of Things Journal**, v. 6, n. 2, p. 2103-2115, 2018. DOI: https://doi.org/10.1109/JIOT.2018.2869847

LUND, B.; AGBAJI, D.; TEEL, Z. A. Information literacy, data literacy, privacy literacy, and ChatGPT: Technology literacies align with perspectives on emerging technology adoption within communities. **Human Technology,** v. 19, n. 2, p. 163-177, 2023. DOI: https://doi.org/10.14254/1795-6889.2023.19-2.2

MEGAHED, F. M.; CHEN, Y. J.; FERRIS, J. A.; KNOTH, S.; JONES-FARMER, L. A. How generative AI models such as ChatGPT can be (mis) used in SPC practice, education, and research? An exploratory study. **Quality Engineering**, v. 36, n. 2, p. 287-315, 2024. DOI: https://doi.org/10.1080/08982112.2023.2206479

MHLANGA, D. Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. In: FinTech and Artificial Intelligence for Sustainable Development. Sustainable Development Goals Series (pp. 387-409). Cham: Springer Nature Switzerland, 2023. DOI: https://doi.org/10.1007/978-3-031-37776-1_17

MONTEIRO, J.C.S. Assistente ChatGPT na educação: possibilidades e desafios. **Revista Ibero-Americana de Humanidades, Ciências e Educação**, v. 9, n. 6, p. 2899-2906, 2023. DOI: https://doi.org/10.51891/rease.v9i6.10482

MOSCOVE, S. A.; SIMKIN, M. G.; BAGRANOFF, N. A.; GOLDSCMIDT, G. G. **Sistemas de informações contábeis**. Atlas, 2002.

MU, Y.; HE, D. The Potential Applications and Challenges of ChatGPT in the Medical Field. **International Journal of General Medicine**, p. 817-826, 2024. DOI: https://doi.org/10.2147/IJGM.S456659

QUISPE-JULI, C. U.; KIRSCHBAUM, J. P.; CACERES-ALBAN, J.; UGAS-CHARCAPE, C. F. Explorando la viabilidad de la integración de la inteligencia artificial en la atención médica pediátrica: Un estudio preliminar con ChatGPT. **Investigación e Innovación Clínica y Quirúrgica Pediátrica**, v. 1, n. 1, p. 14-23, 2023. DOI: https://doi.org/10.59594/iicqp.2023.v1n1.5

RAJKOMAR, A.; OREN, E.; CHEN, K.; DAI, A. M.; HAJAJ, N.; HARDT, M.; ... & DEAN, J. Scalable and accurate deep learning with electronic health records. **NPJ digital medicine**, v. 1, n. 1, p. 1-10, 2018. DOI: https://doi.org/10.1038/s41746-018-0029-1

RAMOS, M. C.; GOMES, D. F.; MELLO, N. F. D.; SILVA, E. N. D.; BARRETO, J. O. M.; SHIMIZU, H. E. Big Data e Inteligência Artificial para pesquisa translacional na Covid-19: revisão rápida. **Saúde em Debate,** v. 46, p. 1202-1214, 2023. DOI: https://doi.org/10.1590/0103-1104202213518

RAVÌ, D.; WONG, C.; DELIGIANNI, F.; BERTHELOT, M.; ANDREU-PEREZ, J.; LO, B.; YANG, G. Z. Deep learning for health informatics. **IEEE journal of biomedical and health informatics**, v. 21, n. 1, p. 4-21, 2016. DOI: https://doi.org/10.1109/JBHI.2016.2636665

RUDOLPH, J.; TAN, S.; TAN, S. ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?. **Journal of applied learning and teaching**, v. 6, n. 1, p. 342-363, 2023. DOI: https://doi.org/10.37074/jalt.2023.6.1.9

SALLAM, M. The utility of ChatGPT as an example of large language models in healthcare education, research and practice: Systematic review on the future perspectives and potential limitations. **MedRxiv**, p. 2023-02, 2023. DOI: https://doi.org/10.1101/2023.02.19.23286155

SALVI, M.; MEIBURGER, K. M.; MOLINARI, F. Softmax-Driven Active Shape Model for Segmenting Crowded Objects in Digital Pathology Images. **IEEE Access**, v. 12, p. 30824-30838, 2024. DOI: https://doi.org/10.1109/ACCESS.2024.3369916

SILVA, J. A. S.; MAIRINK, C. H. P. Inteligência artificial. **LIBERTAS: Revista de Ciênciais Sociais Aplicadas**, v. 9, n. 2, p. 64-85, 2019. Available in: https://famigvirtual.com.br/famig-libertas/index.php/libertas/article/view/247/230 (Accessed March 11, 2024).

SILVA, E. A.; AQUINO, S. C. S.; BEZERRA, C. A. M.; VIANA, D. C. Tecnologias educacionais no processo de ensino-aprendizagem. **Revista Científica Sigma**, v. 4, n. 4, p. 154-164, 2023a.

SILVA, N. M.; SILVA, I. R.; ACIOLY, T. M. D. S.; VIANA, D. C. (2023). Modelo de negócios baseado na Internet das Coisas: uma análise das oportunidades de novos negócios–revisão de literatura. **Interações (Campo Grande)**, v. 24, n. 2, p. 717-726, 2023b.

SINGH, O. P. Artificial intelligence in the era of ChatGPT--Opportunities and challenges in mental health care. **Indian Journal of Psychiatry**, v. 65, n. 3, p. 297-298, 2023. 10.4103/indianjpsychiatry.indianjpsychiatry_112_23

VELÁSQUEZ, F. R. O ChatGPT na pesquisa em Humanidades Digitais: Oportunidades, críticas e desafios. **TEKOA**, v. 2, n. 2, 2023. Available in: https://revistas.unila.edu.br/tekoa/article/view/3711/3308 (Accessed May 11, 2024).

VICARI, R. M. Tendências em inteligência artificial na educação no período de 2017 a 2030: sumário excutivo, 2018.

ZHAI, X. ChatGPT user experience: Implications for education, 2022. Available at SSRN 4312418. DOI: https://dx.doi.org/10.2139/ssrn.4312418

ZHANG, C.; LU, Y. Study on artificial intelligence: The state of the art and future prospects. **Journal of Industrial Information Integration**, v. 23, p. 100224, 2021. DOI: https://doi.org/10.1016/j.jii.2021.100224

ZHANG, Y.; FENG, H.; ZHAO, Y.; ZHANG, S. Exploring the Application of the Artificial-Intelligence-Integrated Platform 3D Slicer in Medical Imaging Education. **Diagnostics**, v. 14, n. 2, p. 146, 2024. DOI: https://doi.org/10.3390/diagnostics14020146