LUMEN ET VIRTUS
ISSN: 2177-2789

EMOTIONAL AND AFFECTIVE IMPACTS OF THE USE OF ARTIFICIAL INTELLIGENCE

https://doi.org/10.56238/levv16n44-026

Submission date: 12/13/2024 **Publication date:** 01/13/2025

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ABSTRACT

The growing adoption of technologies based on Artificial Intelligence (AI) has generated significant social and academic interest, especially with the rapid adoption of generative AI systems such as ChatGPT. These tools, designed to simulate human communication, have become ubiquitous, transforming individual, organizational, and social interactions. This article explores the intersection between AI and human emotional and affective experiences, focusing on the impacts of generative AI on mental health, interpersonal relationships, and social behaviors. Drawing on recent advances in AI, the study presents a critical analysis of the benefits and risks associated with these technologies, including their potential for democratization and accessibility, as well as the ethical challenges posed by biases embedded in their algorithms. The analysis also highlights illustrative cases in which generative AI has influenced emotional well-being, emphasizing the dual role of these technologies as facilitators of connection and potential sources of harm. The article concludes with the importance of discussions on ethics in the development and use of artificial intelligence and on issues of governance and regulation as guarantees for the development and responsible application of AI technologies in different contexts.

Keywords: Artificial Intelligence. Generative Artificial Intelligence. Mental Health. Affective Computing. Ethics in AI.

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INTRODUCTION

AI HYPE VERSUS REALITY

According to LaGrandeur (2023), we are living in a time of hype for technological solutions based on Artificial Intelligence (AI). Although these technologies can potentially have a positive impact on several areas of society, their use without critical scrutiny and understanding of their potential can bring more harm than good. In this sense, the hype surrounding AI increases the possibility of negative consequences for society, including in the fields of public safety, human rights, and business and educational environments (Gallia et al., 2024).

In 2022, approximately 50% of global companies had already adopted AI processes in at least one internal area and 44% of companies were already seeking to implement AI in their existing processes and services. In 2023, the use of AI grew by 250% (MELLO, 2024). One of the most sought-after applications has been used to automate tasks on a large scale or to expand the capacity to analyze data available in organizations' databases. In these cases, AI-based technologies can contribute to improving the performance of corporate processes and services, generating positive impacts on key business efficiency indicators. The global market for AI-based products is expected to be worth over $100 billion by 2028 (MAHESHWARI, 2024; ENHOLM et al, 2021).

These forecasts were affected by the emergence of so-called large language models – large language models or LLM – which are trained from huge amounts of unlabeled data using unsupervised machine learning techniques (NAVEED et al., 2024).

These models, classified as general-purpose, are composed of artificial neural networks with billions of parameters and have high performance in many types of applications, especially those involving the field of natural language. Neural networks constitute a subcategory of machine learning, characterized by the ability of systems to learn from errors and continuously improve their performance (AMAZON, 2024).

Such models are also called generative AI, due to their ability to generate texts, drawings, music, and codes, among others, from the data available in existing databases. ChatGPT, a product developed by the American company OpenAI and launched on the market in November 2022, stood out as one of the first generative artificial intelligence widely accessible to the general public. This was significant, given that most AI solutions were focused exclusively on the corporate market, and their use was restricted to researchers and specialists. In January 2023, the platform reached the mark of 100 million users globally, a record in terms of speed of expansion among users in the digital scenario (SINGH, 2023). In addition to ChatGPT, other models based on deep learning architectures

have become popular in the form of commercial products, such as Google Gemini and Microsoft Copilot. Similar technologies have also been developed in non-Western contexts, such as ERNIE Bot in China and YaLM in Russia (HU, 2023; SINGH, 2023).

Although the emergence of AI-based technologies is not recent, considering that the field of studies dedicated to this topic has been developed for decades, it can be said that the fundamental innovation promoted by OpenAI and other companies in the sector, in addition to the technical characteristics that define the so-called generative artificial intelligence, was the ability to make highly complex technology accessible and simple to use. By developing tools that do not require advanced technical knowledge on the part of users, these organizations popularized access to the technology, expanding the use of AI beyond the domain of companies, universities, and specialists, inserting this technology into the daily lives of millions of people and consolidating it as a tool for common and intuitive use in various daily activities (MINH, 2021).

Despite the positive potential of generative AI tools (MCKINSEY & COMPANY, 2024), there are aspects that involve risks, especially those arising from biases that can be incorporated by algorithms from training and the use of databases. The results may be classifications, recommendations, or other outputs generated by algorithms that reflect patterns of discrimination and exclusion that negatively impact certain social groups, reflecting long-standing structural inequalities in our society (AKTER et al., 2021) and even ethical deviations.

This article aims to discuss the impacts of systems based on artificial intelligence – more specifically, generative AI – on human emotions and affections. To this end, it was based on a review of the specialized literature and illustrative cases of how AI systems are impacting emotional aspects and mental health. Of individuals in different contexts.

IMPACTS OF TECHNOLOGY ON HUMAN EMOTION

There are emotional and affective impacts related to the use of technology and, more specifically, artificial intelligence. To delve deeper into the analysis of the complex relationships between human beings and technology, the concept of affective computing was proposed in 1997 (PICARD, 1997).

This is an academic area that encompasses human emotions, feelings, and emerging perceptions in the interface with some technology. More recently, it has expanded to also encompass the recognition of emotions and analysis of feelings by technological solutions, including AI-based tools. Based on affective computing, it is conceptualized that understanding human emotions in the interface with technology is fundamental to

developing and expanding the effectiveness of AI-based solutions centered on human intelligence (WANG et al., 2022).

Like any technology, AI does not operate in a vacuum, but rather in a complex social, cultural, economic, and geopolitical context, and the emotional and affective impacts can take on both positive and negative characteristics, whether due to the omission of its creators or intentionally. In the Brazilian context, a notable example of a far-reaching affective impact was the advertising campaign sponsored by Volkswagen in 2023 to celebrate the company's 70th anniversary. In a video, the image of singer Elis Regina, one of the most popular artists in Brazilian Popular Music, is recreated through deepfake technology so that she appears to be singing alongside her daughter, Maria Rita. A real duet was never possible due to Elis's death in 1982, at the age of 36, when Maria Rita was only 4 years old (BISCHOFF, 2023). The campaign is considered a milestone in the use of AI in Brazilian advertising, being the first broad exposure of this type of technology to a large part of the population. This sparked a debate in the public sphere about the limits of AI and the ethical aspects related to this technology. Rosa (2024), in a qualitative study analyzing the public's perceptions of advertising, states that "the commercial brought more sympathy, nostalgia, and affection. In other words, it built positive brand memory" (ROSA, 2024, pg. 68).

However, ethical issues related to image rights, dissemination of misinformation, manipulation, and lack of commitment to the truth were also aspects addressed by the public, who, in general, expect that new technologies should be used by brands and companies "in the right measure" and their use should be guided by ethical principles and cause positive impacts on humanity, genuinely serving to help people (ROSA, 2024).

NEGATIVE IMPACTS OF GENERATIVE AI ON EMOTIONS

The ability to create fake interviews and videos, in which a person appears making statements that they never made, is already a technological reality with the potential to deceive and manipulate other people, especially in political contexts. This content is created through generative artificial intelligence technology and is called deepfakes (FARID, 2019).

A notable example occurred in the United States in 2023, when a manipulated video of then-US President Joe Biden making transphobic statements and negative criticisms of minority social groups circulated on social media. Although it was not an isolated case, the event became illustrative of the risks associated with the use of advanced synthetic media generation technologies, especially in heated political and social contexts (REUTERS FACT CHECK, 2023).

After generating significant controversy in public opinion in the United States, an investigation conducted by a media outlet revealed that the video had been created by a Twitter user using deepfake technology. However, by the time this information was released, the impact of the content had already been consolidated, especially in a context in which a large part of the population was not yet familiar with the existence of audiovisual manipulation technologies with such realistic characteristics. The use of this type of resource can generate negative consequences for social cohesion and the stability of democracy.

According to Samer et al. (2023), deepfakes can serve to significantly influence the personal choices of individuals and society as a whole. One of the most profound consequences is related to the disinformation crisis and the breakdown of trust in institutions. In this context, it becomes difficult to separate the false from the true, culminating in post-truth societies where trust between people and institutions is eroded by false content (CHESNEY, CITRON, 2019).

The impacts caused by deepfake technology are not limited to public figures or those of political importance. A report published in 2023 revealed that the nude number of videos created with deepfake technology on the internet has increased by 550% since 2019. In total, 98% of these videos contain pornographic content, and 99% of the people portrayed in these fake materials are women. This scenario highlights an alarming trend of using technology for harmful and malicious purposes, exposing ethical and privacy issues, especially regarding the vulnerability of women in digital environments (SECURITY HERO, 2023).

The use of deepfakes to create explicit content, manipulate people, and spread false information erodes individual and social trust, creating negative consequences in the short, medium, and long term. This scenario becomes even more serious when considering that recent advances in generative technologies for hyper-realistic visual and sound effects may soon make deepfake videos indistinguishable from authentic videos (GROH et al., 2024).

Such risks are particularly worrying in the Brazilian scenario. A study conducted by the Organization for Economic Cooperation and Development (2024) assessed the ability of volunteers from 21 countries to identify fake or misleading news and showed that Brazil has the lowest levels of emotional awareness and discernment related to the use of AI-based technologies. In addition, the research revealed an important correlation between the intensive use of social media as the main source of information and the greater propensity to believe fake news, highlighting the vulnerability of the Brazilian population to misinformation generated by deepfakes (ORGANISATION FOR ECONOMIC CO-

OPERATION AND DEVELOPMENT, 2024). It is also essential to discuss the negative emotional impact from a gender perspective, considering that women who are victims of this practice have their identities appropriated for purposes to which they do not consent. The use of AI as a tool, in this context, reflects a structurally sexist culture that instrumentalizes the female body to serve the interests of certain groups. Laffer and Rehman (2023) show how women targeted by deepfakes suffer long-term emotional and social consequences, such as feelings of fear, psychological and social maladjustment, mental health disorders, and damage to their professional reputation. This directly impacts their social and professional relationships, even causing economic losses.

In the field of work, according to Cremer and Koopman (2024), the growth in the use of AI is associated with negative impacts on employee well-being and engagement. A survey conducted with professionals from Taiwan, Indonesia, the United States, and Malaysia showed that, although AI is allowing workers to achieve higher productivity rates, this efficiency is accompanied by a reduction in the time spent interacting with colleagues. Consequently, there are significant losses in opportunities for collaboration and connectivity within teams, compromising essential aspects of group work (TANG, KOOPMAN, MAI, CREMER, ZHANG, REYNDERS, et al, 2023).

The organizational efficiency achieved through the use of AI-based technologies, when these are not implemented in a way that complements the organizational culture, generates a high cost in terms of employee well-being. The excessive and inappropriate use of AI in some companies increases social isolation among employees, negatively impacting their quality of life. Employees report insomnia, alcohol abuse, worsening mood, a decline in cognitive function, and the emergence of physical and mental health problems (TANG, KOOPMAN, MAI, CREMER, ZHANG, REYNDERS, et al., 2023).

Changes in the dimensions of the work environment and professional socio-emotional relationships are discussed by Graglia and Lazzareschi (2018, 2023) in the context of introducing new technologies in organizational contexts. From this perspective, it is possible to observe the importance of workers preserving and improving a systemic view of their professional activities, integrating new technologies as tools to support work performance, and not as an end goal in themselves. In any case, the advancement of digital transformation processes has severely impacted work methods and relationships (GRAGLIA; LAZZARESCHI; HUELSEN, 2021).

Another aspect that involves emotional impacts on the individual relationship with AI-based technologies is the increasingly frequent use of AI tools for interaction in moments of loneliness or as a way to vent. Although there are chatbots developed specifically for

therapeutic purposes, with the support of mental health professionals and training aimed at this purpose, this type of use is normally carried out with more popular and easily accessible applications, such as ChatGPT. It turns out that this specific technology was designed to perform other functions that do not include adequately addressing users' emotional issues, generating negative emotional and affective impacts (AMARAL, MEIRELES, 2023).

In 2024, an example of this situation gained global notoriety with the suicide of a 14-year-old boy in Florida, United States, after he became involved in a relationship with a chatbot from the company Character.IA, a platform with more than 20 million users, was created by Google. The boy's mother filed a lawsuit against the company responsible for this technology, alleging that the organization created, or facilitated, a scenario of emotional dependence with its product. According to the lawsuit, "abusive and sexual interactions" occurred over ten months between the chatbot and the boy, culminating in a relationship of emotional abuse (HETZNER, 2024).

Character.IA, like other companies that offer similar solutions, is a platform where so-called “AI companions” simulate emotional relationships with users, which can be romantic or sexual. A paper produced in partnership with mental health professionals at the Stanford Brainstorm Lab defines this technology as follows:

> (...) AI companions represent “a new category of technology that goes beyond simple chatbots.” They are designed, among other features, to “simulate emotional bonds and close relationships with users, remember personal details from previous conversations, play roles such as mentors and friends, mimic human emotions and empathy, and agree more readily with the user than typical AI chatbots” (GREENFIELD, 2024; COMMON SENSE MEDIA, 2024).

Former Google CEO Eric Schmidt expressed in an interview his concerns that AI may soon be able to provide ideal romantic partners for teens and young adults who have difficulty relating to other people. According to him, the technology industry as a whole optimizes its products to maximize the attention of its users and monetize it. This could lead the AI market to create increasingly personalized solutions to cause emotional dependence in its users if there are no ethical regulations that can curb this growth (HETZNER, 2024).

There are significant ethical issues involved in this case. For example, Character.IA, despite being aware of the suicidal thoughts expressed by its user, failed to notify its guardians or local authorities. AI models that are not specifically trained with data aimed at welcoming and supporting the mental health of their users can present even more significant risks to vulnerable people. This can lead to adverse consequences for mental

health, as well as for several other aspects of the individual's life, due to the inadequate – and often harmful – support provided in emotionally sensitive contexts.

POSITIVE IMPACTS OF GENERATIVE AI ON EMOTIONS

With recent advances in the field of generative artificial intelligence, a “class of affective computing technologies used in personal and social computing has emerged, encompassing emerging and controversial techniques that aim to classify human emotions and other affective phenomena” (NAZANIN ANDALIBI et al., 2024; authors’ translation).

Although there is still controversy in terms of the benefits and harms of this technology in applications related to psychological support, such as privacy violations and the way these products have been marketed, some solutions have already been used by the general public with positive results, going beyond indirect effects provided by content such as videos or images. AI systems based on real-time feedback can adjust their behavior based on user responses, promoting improvements in the interactive experience to achieve pre-defined goals.

Practical applications of these technologies demonstrate promising results in different areas, such as in the field of mental health and education. In this context, Finnish researchers are developing a system capable of identifying stress levels based on mouse usage patterns on computers. This information generates alerts and directs individuals to appropriate interventions before stress reaches more severe levels. In the area of education, intelligent tutoring systems are being trained to offer personalized learning experiences, allowing students to study at their own pace and receive customized feedback based on the user's interaction with the system. This approach improves learning outcomes and allows students to personalize their learning experience (MUSTAFA, 2024).

In the field of mental health, emotional support applications stand out, designed to offer therapeutic support in cases where the user has difficulty accessing mental health professionals, such as Woebot, a healthcare chatbot. AI-based mental systems are capable of simulating conversations, interpreting what users communicate through written or spoken messages, and offering appropriate responses to interactions (DARCY et al., 2019).

This system was trained with the help of mental health professionals to provide emotional and therapeutic support to users to reduce symptoms of anxiety and depression and, to this end, uses data generated by interactions and information provided by each user (DURDEN et al., 2023).

Research indicates that the use of the application was associated with significant reductions in stress and burnout in users, as well as improvements in indices associated with resilience over eight weeks, especially in users with worse symptoms of anxiety or depression. Although specific, these results illustrate how AI-based solutions have the potential to provide support to people with clinical symptoms who face barriers in accessing mental health professionals (DURDEN et al., 2023), as long as they are not seen as a resource that replaces treatments conducted by specialized professionals. AI applications aimed at mental health can be widely scalable, playing an important role in pre-screening patients and managing mild mental disorders, significantly expanding the scope of psychological care (LIPPI, ABILIO, LIPPI, GRAGLIA, 2024).

ETHICS, GOVERNANCE, AND REGULATION OF AI

According to Crawford (2021), AI is, in its essence, an extraction technology, whose logic manifests itself from the obtaining of minerals used in its infrastructure to the collection of data, often carried out without the consent of individuals. This process includes the capture of collective actions and expressions, consolidating a model that favors exploitation over reciprocity, with potentially serious consequences, depending on the nature of its use.

Contrary to the idea of a two-way street, as proposed by researchers who promote so-called Collaborative Intelligence, AI often operates as a system that encroaches uncontrollably on people's rights and privacy, exacerbating structural inequalities. This scenario is leading to a governance model characterized by anti-democratic tendencies and the worsening of social inequalities since it concentrates power and knowledge about AI-based technologies in a limited number of large corporations.

To mitigate these risks, it is essential to debate and implement regulations and ethical guidelines that guide both the development and application of AI. A significant example of this initiative is observed in the European Union, which has led efforts in this direction (EUROPEAN COMMISSION, 2021; AGÊNCIA BRASIL, 2024).

However, it is worth noting how recent this movement is: the first global legislation specifically aimed at regulating AI was only published in 2024 and will come into force in 2026 (CHEE; HUMMEL, 2024; CRAWFORD, 2021). In Brazil, discussions about risks encompass the right to information when AI systems use personal data, the right to privacy, the right to non-discrimination, and the need to use clear and accessible language for lay audiences (SENADO FEDERAL, 2024).

Although these debates represent initial steps, it is essential to expand and strengthen spaces for discussion, both in formal and informal arenas, considering that AI is

not an isolated technology, but rather a system with a comprehensive impact at the individual, organizational, and collective levels. Therefore, the impact of its use goes beyond its direct users, also affecting the individuals whose data is collected and used to train algorithmic models.

Privacy, ethics, and consent emerge as central elements in the debate on the potential negative impacts of the use of AI technologies on a large scale, especially considering the emotional and affective elements associated with these technologies, whether intentional or not. These aspects become particularly relevant when we observe the long-term implications associated with the indiscriminate use of these technologies, which may involve the perpetuation of stereotypes and exclusion of minority groups, the amplification of prejudices and the worsening of social inequalities, the erosion of public trust in organizations and the intensification of structural divisions. In 2021, the World Health Organization published in its report Ethics & Governance of Artificial Intelligence for Health six ethical principles that guide the responsible use of AI in the health field (WORLD HEALTH ORGANIZATION, 2021). These guiding pillars are of transversal relevance and can be contemplated by organizations that wish to employ AI-based solutions ethically. They can also guide public debates for the development of Regulations and governance systems to ensure the well-being of people and collective interests. The principles include:

i. Protecting people's autonomy;

ii. Promoting human well-being, human security, and the public interest;

iii. Ensuring transparency, explainability, and intelligibility of AI systems;

iv. Fostering responsibility and accountability;

v. Ensuring inclusion and equity in society;

vi. Promoting responsive and sustainable AI.

FINAL CONSIDERATIONS

AI-based solutions have the potential to positively or negatively impact individuals, organizations, and society, depending on the application and how the solutions are developed. Specifically, it is necessary to deepen discussions related to the ethical issues of the use of artificial intelligence technologies related to the emotions of their users, especially considering the commercial context and the lack of adequate government regulation to ensure the well-being of their users.

One of the main challenges lies precisely in the lack of transparency of AI models regarding the criteria used to support their decisions. This opacity can both lead to the marginalization of minority social groups and intensify the social exclusion of these

populations, as well as hide risks in the interaction of users with these systems. This is because the lack of clarity about decision-making processes makes it difficult to identify possible biases and, consequently, prevents the implementation of measures to mitigate them, perpetuating social inequalities and limiting the possibility of corrective interventions (AI NOW INSTITUTE, 2024).

Although the implementation of ethical principles is challenging, especially considering the profound transformations resulting from the recent use of AI-based technologies, the advances recorded in the literature suggest that it is possible to direct the use of these innovations for purposes that positively impact society, aligning technological evolution with individual and collective fundamental rights.

REFERENCES

1. AI NOW INSTITUTE. About Us. [~2024]. Disponível em: https://ainowinstitute.org/about. Acesso em: 29 jul. 2024.

2. AKTER, S. et al. Algorithmic bias in data-driven innovation in the age of AI. International Journal of Information Management, v. 60, p. 102387, out. 2021.

3. AMARAL, R.; MEIRELES, C. ChatGPT no lugar de terapia? Psicóloga lista os perigos dessa prática. Metrópoles, 2023. Disponível em: https://www.metropoles.com/colunas/claudia-meireles/chatgpt-no-lugar-de-terapia-psicologa-lista-os-perigos-dessa-pratica. Acesso em: 29 jul. 2024.

4. AMAZON WEB SERVICES, INC. O que é uma rede neural? Guia de IA e ML - AWS. [~2024]. Disponível em: https://aws.amazon.com/pt/what-is/neural-network/. Acesso em: 29 jul. 2024.

5. BISCHOFF, W. Elis Regina aparece cantando ao lado da filha Maria Rita em campanha feita com inteligência artificial. São Paulo: G1, 2023. Disponível em: https://g1.globo.com/economia/midia-e-marketing/noticia/2023/07/04/elis-regina-aparece-cantando-ao-lado-da-filha-maria-rita-em-campanha-da-volkswagen-feita-com-inteligencia-artificial.ghtml. Acesso em: 29 jul. 2024.

6. CHEE, F. Y.; HUMMEL, T. Europa cria referência global, com legislação para regulamentar IA. Agência Brasil, 2024. Disponível em: https://agenciabrasil.ebc.com.br/internacional/noticia/2024-05/europa-cria-referencia-global-com-legislacao-historica-para-conter-ia. Acesso em: 29 jul. 2024.

7. CHESNEY, R.; CITRON, D. Deepfakes and the New Disinformation War: the coming age of post-truth geopolitics. Foreign Affairs, v. 98, p. 147, 2019.

8. COMMON SENSE MEDIA. Parents' Ultimate Guide to AI Companions and Relationships. 2024. Disponível em: https://www.commonsensemedia.org/articles/parents-ultimate-guide-to-ai-companions-and-relationships. Acesso em: 1 dez. 2024.

9. CRAWFORD, K. The Atlas of AI: power, politics, and the planetary costs of artificial intelligence. Dunmore, Yale University Press, 2023. Disponível em: https://books.google.com.br/books?hl=pt-BR&lr=&id=XvEdEAAAQBAJ. Acesso em: 29 jul. 2024.

10. CREMER, D. D.; KOOPMAN, J. Research: Using AI at Work Makes Us Lonelier and Less Healthy. Harvard Business Review, 2024. Disponível em: https://hbr.org/2024/06/research-using-ai-at-work-makes-us-lonelier-and-less-healthy. Acesso em: 29 jul. 2024.

11. DARCY, A. et al. Woebot: a chatbot for mental health. Journal of Medical Internet Research, 2019.

12. DURDEN, E.; PIRNER, M. C.; RAPOPORT, S. J.; WILLIAMS, A.; ROBINSON, A.; FORMAN HOFFMAN, V. Changes in stress, burnout, and resilience associated with an 8-week intervention with a relational agent "Woebot." Journal of Medical Internet Research, v. 33, p. 100637–7, 2023.

13. ENHOLM, I. M. et al. Artificial Intelligence and Business Value: a literature review. Information Systems Frontiers, v. 24, n. 5, p. 1709-1734, 25 ago. 2021. Disponível em : https://link.springer.com/article/10.1007/s10796-021-10186-w. Acesso em: 29 jul. 20 24.

14. EUROPEAN COMMISSION. Proposal for a Regulation on a European Approach for Artificial Intelligence. 2021. Disponível em: https://eur-lex. europa.eu/legal-content/EN/ TXT/?uri=celex:52021PC0206

15. FARID, H. Deepfakes and the New Disinformation War. Scientific American, 2019.

16. GRAGLIA, M. A. V.; HUELSEN, P.; MUNIZ, A.; VALENTE, C. (org.). Inteligência Artificial: entenda como a IA pode impactar no mercado de trabalho e na sociedade. Rio de Janeiro: Brasport, 2024.

17. GRAGLIA, M. A. V.; LAZZARESCHI, N. A Indústria 4.0 e o Futuro do Trabalho: tensões e perspectivas. Revista Brasileira de Sociologia - RBS, v. 6, n. 14, 30 dez. 2018.

18. GRAGLIA, M. A. V.; LAZZARESCHI, N.; HUELSEN, P. G. V. As formas de resistência dos trabalhadores no contexto da indústria 4.0 e da inteligência artificial. Argumentum, Vitória, v. 13, n. 2, p. 193-207, maio/ago. 2021. Disponível em: https://doi.org/10.4745 6/argumentum.v13i2.27875.

19. GREENFIELD, B. AI chatbot prompted a 14-year-old's suicide, mom's lawsuit alleges: "We are behind the eight ball." Here's how to keep kids safe from new tech. Nova Iorque, Fortune, 2024. Disponível em: https://fortune.com/well/article/how-parents-can-keep-kids-safe-ai-chatbot-suicide-14-year-old-lawsuit/. Acesso em: 1 dez. 2024.

20. GROH, M. et al. Human detection of political speech deepfakes across transcripts, audio, and video. Nature Communications, v. 15, n. 1, p. 1–16, 2 set. 2024.

21. HETZNER, C. Gen Z men could ditch real women for AI, warns Ex-Google CEO Eric Schmidt after a tragic suicide involving a chatbot. Nova Iorque, Fortune, 2024. Disponível em: https://fortune.com/2024/11/28/gen-z-men-lonlineness-ai-google-eric-schmidt-suicide-sewell-setzer-sex-robots/. Acesso em: 1 dez. 2024.

22. HU, K. ChatGPT sets record for fastest-growing user base – analyst note. Nova Iorque, Reuters, 2023. Disponível em: https://www.reuters.com/technology/chatgpt-sets-record-fastest-growing-user-base-analyst-note-2023-02-01/. Acesso em: 29 Jul. 2024.

23. LAGRANDEUR, K. The consequences of AI hype. AI and Ethics, 2023.

24. LAFFIER, J.; REHMAN, A. Deepfakes and Harm to Women. Journal of Digital Life and Learning, v. 3, n. 1, p. 1–21, 2023.

25. LAZZARESCHI, N; GRAGLIA, M. A. V. (Org.). Transformações no mundo do trabalho tensões e perspectivas. São Paulo: EDUC, 2023.

26. LIPPI, F. L.; ABILIO, C. C. C.; LIPPI, J. R.; GRAGLIA, M. A. V. Inteligência Artificial e saúde mental no Brasil: uma revisão sistemática da literatura. Contribuciones a las Ciencias Sociales, v. 17, n. 6, e7935-5, 2024. Disponível em: https://ojs.revistacontrib uciones.com/ojs/index.php/clcs/article/view/7935. Acesso em: 29 jul. 2024.

27. MAHESHWARI, R. Top AI statistics and trends in 2023. Forbes, 2024. Disponível em: https://www.forbes.com/advisor/in/business/ai-statistics/. Acesso em: 29 jul. 2024.

28. MCKINSEY & COMPANY. Tech for Good: using technology to smooth disruption and improve well-being. 2019. Disponível em: https://www.mckinsey.com/featured-insights/future-of-work/tech-for-good-using-technology-to-smooth-disruption-and-improve-well-being. Acesso em: 29 Jul. 2024.

29. MELLO, B. Adoção de IA cresceu 250% em 2023: o que há pela frente? Mundo do Marketing, 2024. Disponível em: https://www.mundodomarketing.com.br/adocao-de-ia-cresceu-250-em-2023-o-que-ha-pela-frente/. Acesso em: 29 jul. 2024.

30. MINH, D. et al. Explainable artificial intelligence: a comprehensive review. Artificial Intelligence Review, v. 55, p. 3503–3568, 2021.

31. MUSTAFA, A. N. The future of mathematics education: Adaptive learning technologies and artificial intelligence. International Journal of Science and Research Archive, v. 12, n. 1, p. 2594–2599, 2024.

32. NAVEED, H. et al. A Comprehensive Overview of Large Language Models. arXivLabs, 2023 [atualizado em 2024]. Disponível em: https://arxiv.org/abs/2307.06435. Acesso em: 29 jul. 2024.

33. NAZANIN, A. et al. What should we do with Emotion AI? Towards an Agenda for the Next 30 Years. In: Companion Publication of the 2024 Conference on Computer-Supported Cooperative Work and Social Computing (CSCW Companion '24). Nova Iorque, 2024. Disponível em: https://doi.org/10.1145/3678884.3689135. Acesso em: 1 dez. 2024.

34. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. The OECD Truth Quest Survey: Methodology and findings. OECD Digital Economy Papers, n. 369, Paris, 2024. Disponível em: https://doi.org/10.1787/92a94c0f-en. Acesso em: 29 jul. 2024.

35. PICARD, R. W. Affective Computing. MIT Press, 1997.

36. REUTERS FACT CHECK. The video does not show Joe Biden making transphobic remarks. 2023. Disponível em: https://www.reuters.com/article/fact-check/video-does-not-show-joe-biden-making-transphobic-remarks-idUSL1N34Q1IW/. Acesso em: 29 Jul. 2024.

37. ROSA, J. Branding e inteligência artificial na publicidade de marca: estudo de caso do comercial “Gerações - 70 anos Volkswagen”. Trabalho de Conclusão de Curso (Graduação em Publicidade e Propaganda) – Universidade Federal do Rio de Janeiro. Rio de Janeiro, p. 83. 2024. Disponível em: https://pantheon.ufrj.br/handle/11422/24328. Acesso em: 29 jul. 2024.

38. SAMER, H.; AL-KHAZRAJI, S.; SALEH, H.; KHALID, A.; MISHKHAL, I. Impact of Deepfake Technology on Social Media: detection, misinformation, and societal implications. Technology and Science, v. 23, 2023. Disponível em: http://www.epstem.net/tr/download/article-file/3456697. Acesso em: 29 jul. 2024.

39. SECURITYHERO.IO. 2023 State of Deepfakes: realities, threats, and impact. 2023. Disponível em: https://www.securityhero.io/state-of-deepfakes/. Acesso em: 29 jul. 2024.

40. SENADO FEDERAL. Relator apresenta relatório atualizado sobre regulamentação da IA. Brasília, 2024. Disponível em: https://www12.senado.leg.br/noticias/materias/2024/07/04/relator-apresenta-relatorio-atualizado-sobre-regulamentacao-da-ia. Acesso em: 29 jul. 2024.

41. SINGH, O. Artificial intelligence in the era of ChatGPT – opportunities and challenges in mental health care. Indian Journal of Psychiatry, v. 65, n. 3, p. 297, 2023.

42. TANG, P. M.; KOOPMAN, J.; KE, M. M.; DE CREMER, D.; ZHANG, J. H.; REYNDERS, P. et al. No person is an island: unpacking the work and after-work consequences of interacting with artificial intelligence. Journal of Applied Psychology, v. 108, n. 11, p. 1766–89, 2023.

43. WANG, Y. et al. A systematic review on affective computing: emotion models, databases, and recent advances. Information Fusion, v. 83-84, p. 19–52, 2022.

44. WORLD HEALTH ORGANIZATION. Ethics and governance of artificial intelligence for health. WHO, 2021. Disponível em: https://www.who.int/publications/i/item/9789240029200. Acesso em: 29 jul. 2024.