EDUCATIONAL CHALLENGES WITH CHATGPT: INTEGRATE OR MARGINALIZE?

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ABSTRACT

Artificial intelligence language models have revolutionized the way education is accomplished, namely the teaching-learning processes. Currently there is a very broad debate about these models that is not only in the academic and scientific communities, but also in the civil community. It is discussed and reflected, essentially, about ChatGPT as a model that can contribute to innovation in the educational context, but also about the ways in which this technology can condition learning and calls into question the functions of teachers and even the current school. It is in this sense that this research aims, by conducting a systematic review of the literature, to identify the challenges that language models, namely the ChatGPT bring to the educational context. The results point to the importance of integrating these models in the teaching-learning process, but also to the existence of a set of challenges for the school as an institution, but also for teachers and students as central actors in the educational process. In addition to identifying the challenges, some suggestions are also presented that may contribute to help solve some of the challenges identified.

KEYWORDS

Artificial intelligence, chatGPT, educacion, innovation, teaching-learning process, digital technologies.

1. ARTIFICIAL INTELLIGENCE IN EDUCATION

If there is one area that constantly needs to modernize, reinvent and innovate, it is education, given the responsibility it has in endowing and training individuals with knowledge and skills useful to their development, but also to the development of societies. This has been the case since prehistoric times (ancient Greece and Rome, Middle Ages, modernity (Enlightenment, French Revolution, Industrial Revolution and the Information Age) and now post-modernity (Industry 4.0, 4th Industrial Revolution or Education 4.0). Education 4.0 designates the educational approach and set of strategies that would be desirable to address the current needs. of the so-called "Fourth Industrial Revolution". This term presented by Schwab (2015), has emerged to describe this whole generation of technological advances, namely, the Internet of Things, Big Data, Robotics, Artificial Intelligence, among others.

Considering the importance that technologies 4.0 have for innovation and improvement of the quality of teaching-learning processes and for the acquisition of skills by both students and teachers, it is essential to conduct research involving artificial intelligence language models in the educational context, namely, the challenges inherent in their use.

The use of artificial intelligence in education has had a great impact, including greater efficiency, global learning, personalized/personalized learning, smarter content, and greater effectiveness and efficiency in education administration, among others (Timms, 2016). The use of artificial intelligence in education is rapidly expanding (Roos, 2018) and has been incorporated into administration, instruction or teaching, and learning (Chassignol et al., 2018). Virtual advising without human intervention, assessment managers to

design exams, personalized recording and evaluation of academic performance, strengthening personalized education through crowdsourcing, among others.

Artificial intelligence language models, like everything in education, have their advantages and disadvantages for the teaching-learning process. Some of the advantages have to do with being able to customize the educational process for each student, ensuring that they learn at their own pace and according to their needs. The guarantee of autonomous learning seems to be another advantage, since IA models can not only teach students but also assess their learning, without the need for a teacher to be present. Another advantage is improved efficiency, allowing the teacher to focus on more complex tasks, while AI can handle more routine and repetitive tasks. Recording and analyzing data on student performance is another advantage, as it enables teachers to identify areas that need improvement. Also in a recent research, Nalbant (2021) identifies a number of advantages of artificial intelligence for education, namely: access to information, distance learning, personalization in education, global knowledge, student attendance tracking, digitalization and environmental protection, removing barriers, error reduction, taking on challenging explorations, medical applications, uninterrupted operation for long periods and the daily applications. In addition to the disadvantages, there also seem to be some disadvantages with, for example, the absence of humanity in teaching and learning, as there is no meaningful human interaction. The lack of empathy, which leads to a lack of expression of students' emotions and feelings, which can affect the quality of teaching and learning. Dependence on technology can also be problematic if the technology fails or becomes obsolete. To these disadvantages we can add others (Nalbant, 2021): technology addiction, negative impact on social life, negative impact on health, probability of causing unemployment, lack of creativity, income distribution imbalance, high cost, unethical and the lack of experience.

Obviously, for each artificial intelligence language model there is a set of associated advantages and disadvantages. There are several authors who reflect and discuss these matters (Alshurafat, 2023; Baidoo-Anu & Owusu Ansah, 2023; Celik et al., 2022; Deng & Lin, 2022; Lund & Wang, 2023; Pfeffer et al., n.d.; Segrave et al., 2005). However, since this is not the focus of this research, we have chosen not to talk about them in this study.

The use of large language models in education has been identified as a potential area of interest due to the diverse range of applications they offer (Kasneci et al., 2023). The use of chatbot technology in education is one of the most important approaches to enhancing and promoting a more personalized learning experience (Cunningham-Nelson et al., 2019). Chatbots are conversational or interactive agents that provide instant response to the user (Okonkwo & Ade-Ibijola, 2020; Smutny & Schreiberova, 2020). Chatbots can instantly provide students with standardized details, such as course contents (Cunningham-Nelson et al., 2019) practice questions and answers (Ranoliya et al., 2017; Sinha et al., 2020), evaluation criteria (Benotti et al., 2017; Durall & Kapros, 2020), assignment due dates, advice (Ismail & Ade-Ibijola, 2019), campus path direction (Mabunda & Ade-Ibijola, 2019), and study materials. From the perspective of learning opportunities, these models can enable diverse types of experiences for: elementary school students, middle and high school students, university students, group and distance learning, empowering students with disabilities, and for professional training (Kasneci et al., 2023). Effectively, this type of models can contribute to the teaching-learning process for several areas and study cycles in education and, consequently, to the development of the various educational agents. However, there are implications that are important to bear in mind, such as security, reliability and privacy, manipulation through the spread of misinformation, prejudice and social discrimination, and the absence of personalized feedback.

An example of a chatbot probably more recent at this moment is ChatGPT that seems to be bringing to education several types of implications that are currently under debate in the scientific community, but also in civil society. Students, parents, employees, directors of educational institutions, parents, higher education institutions, politicians and ordinary citizens reflect and debate about this kind of models in the teaching-learning process: What to do? How to deal with the situation? Do we ban it or integrate it into the teaching-learning process? Is it possible to forbid? Is it possible to integrate? If yes, in what way? There are countless questions involving the theme. It is important to note that ChatGPT is a specific type of chatbot known as a “language model”, which uses artificial intelligence and machine learning to generate responses based on context and previous conversation history. This model has been trained on a massive amount of data, allowing it to understand and generate human-like text with remarkable accuracy (Aljanabi et al., 2023). Chatbot technology is a good innovation with capabilities to improve not only teaching and learning, but all other aspects of education (Okonkwo & Ade-Ibijola, 2021), and therefore presents itself as a very important area of research today.

2. METHOD

This research is supported by a systematic literature review that aims to identify some of the challenges that artificial intelligence language models such as ChatGPT can bring to the educational context. Presenting some suggestions to overcome these obstacles is the second objective of the research.

The systematic literature review was carried out taking into account the definition of the following set of criteria (keywords): (i)Type of documents: scientific articles; (ii) Language: Portuguese and English; (iii) Keywords: "challenges of artificial intelligence language models in education"; "challenges of ChatGPT in education"; "Problems and opportunities of ChatGPG for education"; "Education with ChatGPT". It should be noted that, in addition to being searched in English, the keywords were also translated into Portuguese and searched in the following databases: (iv) Scielo, Springer, Web of Science, Scopus and Google Scholar; (v) Period: last six years (January 1, 2018 to February 1, 2023).

In addition to formulating the review question and research criteria, the literature review took into account the selection and evaluation of studies, data extraction, and also the analysis, interpretation, and presentation of results.

This study is further supported by exploratory research because the researchers, supported by the set of previously defined criteria, identify some of the challenges of ChatGPT for the educational context. Data of qualitative nature were recorded in the researcher's diary according to previously defined criteria. Subsequently, they were processed, analyzed, and categorized in Microsoft Excel with the aim of identifying the various directions of response. The following table identifies only the articles selected for the scope of the research:

Authors	Year	Title
Aljanabi, M., Ghazi, M., Ali, A. H., & Abed, S. A.	2023	ChatGpt: Open Possibilities. Iraqi Journal For Computer Science and Mathematics
Baltar, R., & Baltar, C. S.	2023	Professores serão substituídos pela inteligência artificial?
Carmo, C. R. S., Carmo, R. D. O. S., & de Melo, G. D.	2022	A inteligência artificial e os desafios na avaliação da escrita académica.
Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S.	2022	The promises and challenges of artificial intelligence for teachers: A systematic review of research.
Chen, X., Zou, D., Xie, H., Cheng, G., & Liu, C.	2022	Two decades of artificial intelligence in education
de Farias, S. A.	2023	Pânico na Academia! Inteligência Artificial na Construção de Textos Científicos Com o Uso do ChatGPT
García-Peñalvo, F. J.	2023	The perception of Artificial Intelligence in educational contexts after the launch of ChatGPT: Disruption or Panic?
Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., ... & Kasneci, G.	2023	ChatGPT for Good? On Opportunities and Challenges of Large Language
King, M. R., & chatGPT.	2023	A Conversation on Artificial Intelligence, Chatbots, and Plagiarism in Higher Education
Pfeffer, O. P., Sailer, M., Schmidt, A., Seidel, T., Stadler, M., Weller, J., ... & Kasneci, G.	2022	ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education.
RudolphA, J.	2022	ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?
Susnjak, T.	2022	The End of Online Exam Integrity?
Thorp, H. H.	2023	ChatGPT is fun, but not an author
van Dis, E. A., Bollen, J., Zuidema, W., van Rooij, R., & Bockting, C. L.	2023	ChatGPT: five priorities for research
Velásquez, F. R.	2023	O ChatGPT na pesquisa em Humanidades Digitais: Oportunidades, críticas e desafios
Zhai, X.	2023	ChatGPT for Next Generation Science Learning

Table1: Articles from the systematic literature review

As can be seen in the previous table, of the total 23 articles identified, 16 were selected and, therefore, 7 were excluded for not meeting the requirements defined for conducting the systematic literature review.

3. DISCUSSION OF RESULTS

The emergence of artificial intelligence language models has had a huge impact on the way we look at education at all stages - planning, implementation, monitoring and evaluation. Models like the ChatGPT have arrived and set whole communities thinking and arguing about the topic to find the most appropriate answers possible. Integrating technologies into the teaching-learning process has never been an easy task, especially to get them used for educational purposes. The biggest challenge is even to ensure control and monitoring in the use of these technologies and to create limits for their use in the educational context. The ChatGPT as a technology that offers access to (un)information can effectively pose a problem for the stakeholders in the teaching-learning process. AI is integrated into several instructional technologies such as chatbots (Clark, 2020).

A recent study provides a structured understanding of the use of chatbots in educational processes, including teaching and learning administrative tasks, student assessment, and research and development (Durall & Kapros, 2020; Hien et al., 2018; Ho et al., 2018; Medeiros et al., 2018; Sinha et al., 2020). The use of chatbots has several implications in the various vital areas of education. The main challenges faced by the use of chatbots for educational activities have been elucidated in accordance with the reports of (Cunningham-Nelson et al., 2019; Huang et al., 2020; Rapp et al., 2021; Ruane et al., 2019). Some challenges of ChatGPT seem to be related to the following: academic writing, ChatGpt as a search engine, coding, detecting security vulnerabilities and social media. Regarding academic writing "ChatGPT-3 is not a substitute for human intelligence and creativity. It should be used as a tool to assist with academic writing, rather than to replace it" (Aljanabi et al., 2023). In this sense, as is logical, the student cannot use ChatGPT to write papers, activities, articles and other elements for him, but rather assist him in this writing. Even in the writing aid, the output generated by ChatGPT-3 must be checked and reviewed by the user, as it is not always 100% accurate (Nguyen, 2023). One of the main advantages of using ChatGPT as a search engine is its ability to understand and answer natural language questions. However, one of the main limitations is its cost and accessibility (Aljanabi et al., 2023), as ChatGPT is currently only available to a select group of developers and researchers, which limits its potential user base (Aljanabi et al., 2023). Also the cost of using ChatGPT may be prohibitive for some users, making it less accessible to small businesses and individuals (Aljanabi et al., 2023). In this sense, both accessibility and the associated costs seem to be two important challenges that education has to overcome, since education is the full representation (or at least it should be) of the democratization of knowledge and free access to knowledge. When it comes to coding is that ChatGPT is not yet able to fully understand the nuances of programming languages and therefore may not always provide the most accurate or useful information (Aljanabi et al., 2023). This is an emerging challenge for educational context, in that it requires teachers and students to validate and/or corroborate with another source whether or not the output is actually correct. Will they corroborate the information or will they facilitate it? At the level of security vulnerability detection, it appears that it is not possible to deal with certain types of queries, such as reverse engineering or malware analysis (Hammad, 2023). Here too, it is important to understand that, especially in an educational context, special attention should be given to security issues, as they are a daily challenge that schools have to deal with every day. Protecting our children, young people and adolescents has to be a priority. Finally, another challenge is that ChatGPT is not yet able to fully understand the nuances of human language and social media communication and therefore may not always provide the most accurate or useful information (Aljanabi et al., 2023). As previously mentioned, it is also important to corroborate sources and not copy and paste information that is uniquely and absolutely correct.

In addition to these challenges, there are others of equal importance, such as the danger of plagiarism. This is the problem that comes to mind when talking about ChatGPT. Just as a journalist can produce an article with ChatGPT support, a student can also carry out a work in its entirety using this technology. Incidentally, fearing that students will start cheating, the city of New York in the United States of America has banned the use of the tool on all devices and networks in public schools. However, in addition to plagiarism, there is the assumption that these automated responses may expose students to texts with sexism, racism and other discriminatory manifestations. An example is the case presented by Professor Darren Hick, from Furman University in the United States, who reported that one of his students had used the chatbot to write a 500-word essay on the 18th century philosopher, David Hume, and his work "The horror paradox" (Mitchell, 2022). A student of the Master's degree in Biomedical Engineering and Biophysics at the Faculty

of Sciences of the University of Lisbon (Portugal) used the GPT Chat to answer a question from an exam in the discipline “Medical Devices I” (Araújo, 2023). is that the professor himself considers that the tool should not be banned, since "Blocking GPT Chat by universities does not solve the danger of fraud". He also suggests that the alternative involves developing a solution that easily detects plagiarism and resorts to artificial intelligence (Araújo, 2023). These obviously not being the only cases, they clearly demonstrate the attempt to use this technology by students to cheat. This teacher was able to detect the case of plagiarism, but is it possible to detect all of them? Do teachers, for the purpose of evaluating a given work, have time to confirm line by line, paragraph by paragraph, page by page whether there is plagiarism in each student's work? Or should we go for the solution suggested by the professor - Similarity Detector Software? How can we ensure that the work is not partially or fully performed by ChatGPT? Can we do anything about this practice? What? So, afraid that students will start cheating, the city of New York in the United States of America has banned the use of the tool on all devices and networks in public schools. The French University of Sciences Po has also banned the use of GPT Chat. But is banning any good? Ensuring the authenticity of a piece of work is indeed a huge challenge in education, but maybe it's really time to face this not as a problem, but as an opportunity for change. Perhaps it is really important to reflect, debate and discuss in the academic and scientific communities, but even in civil society, if education instead of being afraid, it should not take the opportunity to rethink new teaching methods, but also assessments. Also Zhai (2022) points to the challenge of rethinking the evaluation. Maybe the solution has to come through here!

However, in addition to the huge risk of plagiarism that can be tackled through similarity detector doftware, but also through other emerging technologies, Chat GPT brings other challenges for education. Other studies also identifies some important challenges such as, for example, issues related to bias and fairness in which large language models can perpetuate and amplify existing biases and unfairness in society, which can negatively impact teaching and learning processes (Kasneci et al., 2023). Also learners may rely too heavily on the model. This confidence, without questioning, without corroborating with another source, without contrasting and comparing, can lead to the presentation of false information. The effortlessly generated information could negatively impact their critical thinking and problem-solving skills (Kasneci et al., 2023). It is important to be aware of the limitations of large language models and use them only as a tool to support and enhance learning (Pavlik, 2023). Another challenge is also the dependence of teachers on this type of models. These models can provide accurate and relevant information, but they cannot replace the creativity, critical thinking, and problem-solving skills that are developed through human instruction. It is therefore important for teachers to use these models as a supplement to their instruction, rather than a replacement (Kasneci et al., 2023). A lack of understanding and expertise that has to do with the fact that many educators and educational institutions may not have the knowledge or expertise to effectively integrate new technologies in their teaching (Redecker, 2017). Educational theory has long since suggested ways of integrating novel tools into educational practice (Salomon, 1993). However, it is recognized that the constant integration of technologies in the teaching-learning context is not easy, as it requires constant updating on the part of the teacher and digital skills that are absolutely fundamental. As with any other technological innovation, it is very important to effectively use them to supplement or enhance specific learning processes. generated answers is another challenge, as It is becoming increasingly difficult to distinguish whether a text is machine- or human-generated, presenting an additional major challenge to teachers and educators (Cotton et al., 2023; Dehouche, 2021; Elkins & Chun, 2020; Gao et al., 2022). This situation is also in line with what was discussed above. Also the maintenance of large language models could be a financial burden for schools and educational institutions, especially those with limited budgets (Kasneci et al., 2023). This is really a huge challenge, as educational institutions have fewer and fewer resources. The use of large language models in education raises concerns about data privacy and security, as student data is often sensitive and personal (Kasneci et al., 2023). Obviously, this raises several questions related to data confidentiality and access authorizations. Sustainable usage has to do with high energy consumption. Hence, energy-efficient hardware and shared (e.g., cloud) infrastructure based on renewable energy are crucial for their environmentally sustainable operation and scaling needed in the context of education (Kasneci et al., 2023). At a time when we live in an energy and environmental crisis, it is fundamental to be concerned about these two matters, which also constitute a great challenge Saving environmental concerns are also a great challenge in this matter. With regard to the cost to verify information and maintain integrity it is important to verify the information provided by the model by consulting external authoritative sources to ensure accuracy and integrity (Kasneci et al., 2023). Finally, the lack of adaptability, since large language models are not able to adapt to the diverse needs of students and teachers, and may not be able to provide the level of

personalization required for effective learning (Kasneci et al., 2023). Eventually, with later models, this adaptability tends to increase, but it is still considered a challenge for education today.

Obviously there are many challenges and many more will arise in the near future as models like ChatGPT are here to stay. The important thing is to integrate these models into the teaching-learning process and not put them aside or marginalize them. When we refer to integrating these models, we don't mean that it has to be the only tool for acquiring skills, but rather as a tool that can effectively contribute to help in the learning process of both students and teachers: for students in terms of learning and for teachers in terms of preparing and teaching their classes. There are three vectors that, supported by the literature and our experience in ChatGPT, we have identified and that seem fundamental to contribute to overcome some of the challenges: rethink, train and raise awareness.

Rethink the extent to which we should be disruptive, not be afraid to be bold and take decisions to improve the quality of education. It is important to rethink whether the current educational model responds to reality, whether it is current and whether it responds to the needs of students and the labor market itself, in short, companies, organizations. In this line, it is necessary to reflect on the methodologies and pedagogies to be adopted in the context of the classroom, whether face-to-face or online. But it is also necessary to go further. We probably have to think about the way in which educational content is produced, how it is disseminated and how it is taught. The teaching and assessment processes are also at stake at the moment, and therefore must be deeply debated and questioned.

Train because teachers who have skills in these technologies can contribute more to the dynamism of learning itself, to help motivate other colleagues. However, it is not enough for students to have skills, it is essential that teachers are able to keep up with this change and, likewise, use these technologies in an innovative way. Training should be not only in the technical and digital field, but also and especially in careful preparation in identifying and selecting reliable, true and useful information. In a world where we are no longer able to distinguish between what is true and what is false, models such as the GPT Chat have created even more problems in this regard. In this sense, it is necessary to invest heavily in training educational actors in accessing, analyzing, processing, categorizing and assigning information.

Raise awareness because it is very important to raise everyone's awareness of the impact that these models have on education, but also on citizens' daily lives. Raising awareness of the benefits of these environments, but also of their previously mentioned disadvantages The inherent challenges that these models bring to education are also central aspects that deserve special attention. The need for training in the area of information and in the digital area, the importance of technologies that guarantee that a given product was designed by the author and not by technology and the change in the current paradigm in education are aspects that educational actors must reflect on, but for that this reflection has to be raised, they have to be sensitized to it.

4. CONCLUSIONS

The research allowed to identify a set of challenges that models such as ChatGPT can create in an educational context. Some of these challenges are possible to identify at present, but others will certainly arise in the future with the evolution of technology, particularly in the area of artificial intelligence. We also identified some ways to overcome these challenges that can be adopted partially or totally for education.

The title of this article presents us with the question of whether to integrate or marginalize ChatGPT. The answer is very simple: we should seek to integrate this and similar technologies in the teaching-learning process, regardless of the challenges associated with this process, implications or even fears that as professionals and researchers in education we may have. Education needs disruption, modernization of practices and methodologies that are innovative and closer to the students. It is necessary to try to reinvent the role of the school, but also the role of the teacher. It is impossible that technologies like ChatGPT continue to emerge and the teacher continues to be the same, with the same functions, changing absolutely nothing. It is necessary to act quickly, to help teachers to change their practices, but also the students. We all have to be responsible for the change that starts with the integration of these technologies in the teaching-learning processes. Putting these technologies aside, pretending they don't exist, or simply banning them is no good, is not an option, and is impossible in a digital society. Rethink, train and raise awareness seem to be three ways that can contribute to help overcome the challenges. Rethink in that we must be disruptive, not be

afraid of fear, and innovate daily with these technologies. Train, because teachers with skills in these technologies can contribute to improving the quality of the educational process, but also to increase the literacy of students in different subjects and in the digital domain. Raise awareness since it is important to aggregate efforts for the importance of these technologies in education, for the dynamics of learning, for the approach to students, but also to the educational reality in a digital society.

Are we ready to revolutionize education? Are we ready or are we not ready? We have only one alternative: to be ready!

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