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Using ChatGPT in the classroom: Experience Report

Uso do ChatGPT em sala de aula: Relato de Experiência

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Resumo

O ChatGPT é um modelo de linguagem desenvolvido pela OpenAI, baseado na arquitetura GPT-3.5 (Generative Pre-Trained Transformer 3.5). Alimentado por uma vasta quantidade de dados, o ChatGPT tem sido utilizado na área da saúde para auxiliar profissionais. No entanto, na pesquisa científica e no contexto educacional, seu uso deve ser responsável. Este relato visa compartilhar a experiência do uso da ferramenta de Inteligência Artificial durante uma aula do componente curricular obrigatório Estágio Supervisionado I, com alunos do quinto período do curso de graduação em Odontologia da Universidade Federal da Paraíba (UFPB) - Campus I. A atividade contou com a participação de graduandos, pós-graduandos e professores do curso de Odontologia da UFPB, em João Pessoa, Paraíba, Brasil. A disciplina tem como objetivo inserir os discentes em um campo de prática real e virtual, utilizando casos clínicos da área de estomatologia provenientes do Setor de Triagem da Clínica-escola de Odontologia e do aplicativo móvel TeleEstomato - Paraíba. Durante a discussão dos casos clínicos, o ChatGPT foi integrado com a Alexa para auxiliar no levantamento de hipóteses diagnósticas. A experiência relatada foi considerada proveitosa para todos os envolvidos, pois oportunizou uma maior integração e discussão entre os discentes, além de entender como uma ferramenta de modelo de linguagem como o ChatGPT pode auxiliar na Educação com provável reflexo positivo na prática odontológica, especialmente, no campo da Estomatologia. O uso do ChatGPT demonstrou potencial para enriquecer o aprendizado e a prática clínica, desde que utilizado de forma orientada por especialista.

Palavras-chave: Inteligência Artificial. Ensino. Diagnóstico Bucal.

Abstract

ChatGPT is a language model developed by OpenAI, based on the GPT-3.5 architecture (Generative Pre-Trained Transformer 3.5). Powered by a vast amount of data, ChatGPT has been used in the healthcare field to assist professionals. However, in scientific research and educational contexts, its use must be responsible. This report aims to share the experience of fifth-semester students from the Dentistry undergraduate program at the Federal University of Paraíba (UFPB) - Campus I, during a class of the mandatory curriculum component of Supervised Internship I. The activity involved the participation of undergraduates, postgraduates, and professors from the Dentistry course at UFPB, in João Pessoa, Paraíba, Brazil. The course aims to immerse students in a real and virtual practice field, using clinical cases from the screening of the Dentistry school clinic and the TeleEstomato - Paraíba mobile application. During the discussion of a clinical case, ChatGPT was integrated with Alexa to assist in generating diagnostic hypotheses. The reported experience was beneficial for all involved, providing an opportunity to integrate and understand how a language model tool like ChatGPT can assist in dental practice, especially in the field of Stomatology. The use of ChatGPT demonstrated potential to enrich learning and clinical practice, provided it is used responsibly.

Keywords: Artificial Intelligence. Teaching. Oral Diagnosis.

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Introduction

ChatGPT™ is a language model created by OpenAI, based on the GPT-3.5 (Generative Pre-Trained Transformer 3.5) architecture. Trained on a wide variety of data, including articles, web pages and books, the chatbot is capable of generating coherent and accurate responses in conversations, using natural language. However, ChatGPT™ is not a true artificial intelligence (AI), in fact making use of its pre-training. The language model is pre-trained with a large set of textual data, trying to predict the next word in a sentence based on the context. After recognizing these patterns, it uses examples of simulated dialogues and conversations to formulate a coherent response[1].

The vast volume of biomedical data and information available in virtual health libraries and other databases makes it possible to use AI systems to process these data in order to assist healthcare professionals in caring for patients. This assistance can come in many forms, from possible drug contraindications to diagnostic hypotheses based on case descriptions. Since the algorithms used by AI have the capacity for refinement through their own functioning (self-learning), their potential to generate increasingly accurate diagnostic hypotheses becomes more pronounced as new data from medical records are integrated into supercomputer systems such as IBM's Watson and Google's DeepMind[2].

Despite all its potential benefits, ChatGPT™ has introduced new challenges and warnings for scientific research and education in the health area[3]. Contrary to its ability to generate accurate responses in most cases, there are still reports of false or incorrect information, based on references to which the user cannot be redirected or have access. Furthermore, given its ability to provide specific responses, the tool can be used for complete text production at satisfactory levels and completion of activities incredibly quickly, representing a focus of concern for educators and researchers. Therefore, it is necessary to use this tool in a controlled and responsible manner for any purpose, ensuring that it is not used to the detriment of critical and creative thinking, thus compromising the integrity of academic thought[2,3].

In this context, this experience report aims to share the experience of fifth-semester students from the Dentistry undergraduate program at the Federal University of Paraíba (UFPB) - Campus I, during a class of the mandatory curriculum component of Supervised Internship I. In this class, the Amazon Alexa and ChatGPT™ technological resources were used as teaching tools to assist students in the investigation of a clinical case originating from the Stomatology teaching clinic of the Dentistry course. The proposal of the activity was to formulate diagnostic hypotheses based on data from the patient's medical records, as well as descriptions and photographs of the case. This report aims to promote good practices in the use of ChatGPT™ in the classroom and encourage its replication in other educational contexts.

Materials and Methods

This is a descriptive experience report that narrates the experience lived by fifth-semester students during an activity of the Supervised Internship I discipline of the Dentistry course at UFPB. The participation included undergraduate students, postgraduate students and professors of the Dentistry course at UFPB, developed on April 13, 2023, during class time of the Supervised Internship I discipline.

The discipline aims to insert students in a real and virtual field of practice using as a basis the clinical cases from the screening of the Dentistry teaching clinic and the TeleEstomato - Paraíba[4] mobile application, developed by the Digital Dentistry Laboratory linked to the Graduate

Program in Dentistry (PPGO/UFPB). In this sense, the discipline introduces students to the practice of screening and encourages discussions of clinical cases, thus encouraging them to formulate appropriate diagnostic hypotheses, and to be able to come up with innovative and creative solutions for this purpose.

Results

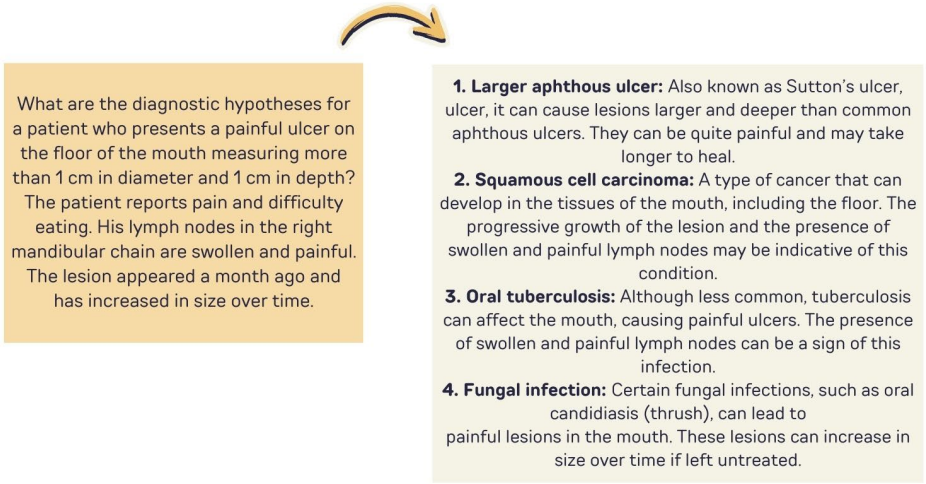
Presentation of the Clinical Case

A 48-year-old male patient, a farmer, with history of smoking and drinking for over 30 years, does not regularly use medication and did not provide information about his medical history. Approximately 1 month ago, the patient noticed the presence of lesion due to pain. In the extraoral clinical examination, infarcted lymph nodes were identified in the submandibular chain on the right side, which presented sensitivity to palpation. Intraoral clinical examination revealed an ulcer measuring over 1 cm in diameter and 1 cm in depth, located on the floor of the mouth.

Discussion of the Clinical Case

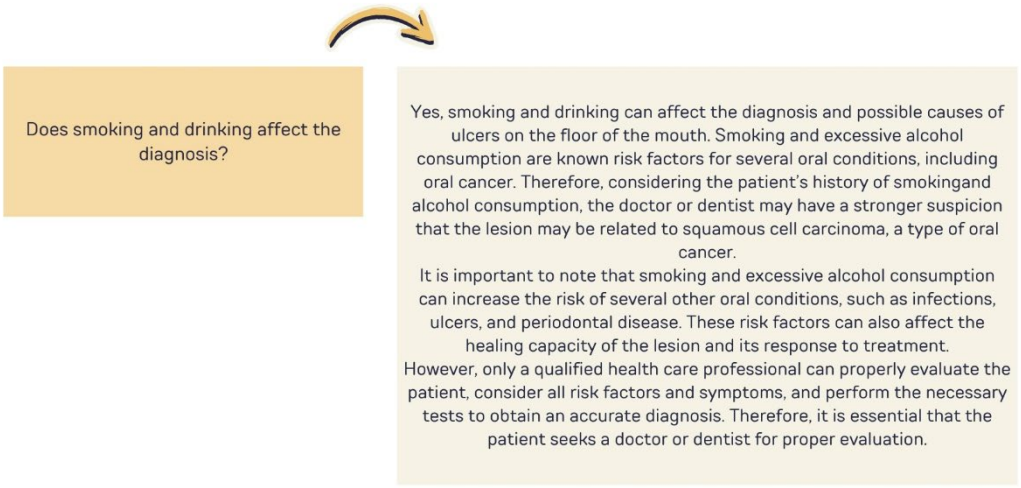
The discussion began with questions about the case presented and individual searches on web browsers by students of the discipline, who gradually shared the most relevant findings with the rest of the class. To speed up and simplify the search and sharing of findings, the Amazon virtual assistant, Alexa, was initially used. It offered merely basic responses, which did not significantly contribute to the discussion. In addition, the assistant often did not understand the question being asked, reproducing words as pronunciation. During the class, a student had the idea of describing the entire clinical case in ChatGPT™, and asked for diagnostic hypotheses. In response, ChatGPT™ emphasized that it is not capable of making medical diagnoses, and that analysis by a doctor or dentist is of fundamental importance, who should also request additional tests (Figure 1).

Figure 1. Description of the clinical case sent by the student and diagnostic hypotheses listed by ChatGPT™.



After the hypotheses were presented, the student asked the chatbot whether the fact that the patient was a smoker and an alcoholic provided a stronger indication for either of the hypotheses. In response, ChatGPT™ warned about the strong association between alcoholism and smoking with the development of oral cancer, including Squamous Cell Carcinoma (SCC) (Figure 2).

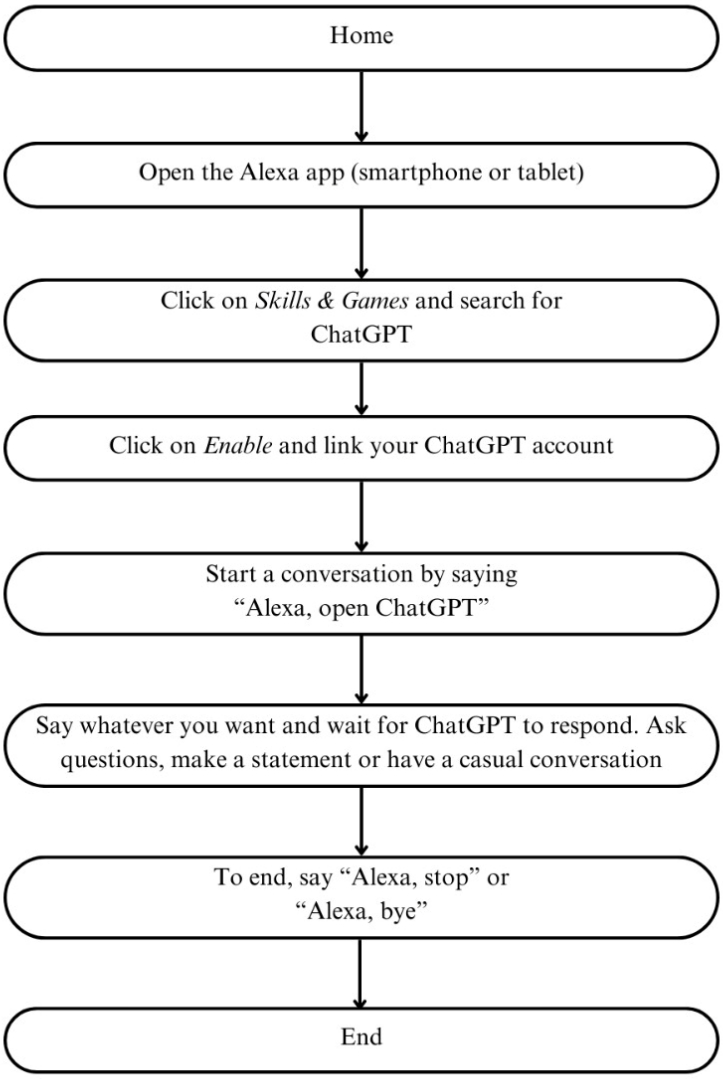
Figure 2. Student's question about risk factors and ChatGPT™'s response.



Immediately after the new information was presented, professors were visibly surprised to realize that ChatGPT™ not only correctly listed the hypotheses and their probabilities, but also adequately restricted the diagnosis based on the risk factors presented by the patient. In addition, the chatbot correctly hypothesized SCC, since professors confirmed that the histopathological analysis of the case had already been performed and was positive for SCC.

Thus, as the discussion progressed, the possibility of integrating Alexa with ChatGPT™ was presented, enabling the parallel use of both tools. It is important to note that there is no direct integration between ChatGPT™ and Alexa, since GPT is a text-based language model, while Alexa is a voice-activated virtual assistant with specific functionalities. However, it is possible to establish an indirect integration by using the OpenAI API to exchange text with ChatGPT™. This functionality can then be connected to the Alexa platform, thus enabling the processing of voice commands and the delivery of responses in audio format. The steps required for this integration are described in Figure 3.

Figure 3. Steps for integrating Alexa with ChatGPT™.



Discussion

This experience report demonstrates the use of ChatGPT™ in the classroom, highlighting the challenges and advantages associated with the integration of artificial intelligence technologies in the academic environment. In literature, positive results have also been found regarding the use of ChatGPT™ in education, with improvements especially in the development of students' skills and abilities[5]. Furthermore, there is discussion about ChatGPT™'s ability to enhance educational experiences by providing assistance, guidance, and feedback to students, which can directly increase motivation and engagement in the learning process[6].

Several areas of knowledge are exploring ChatGPT™ and its applicability to teaching. In the study by Park (2023)[7], it is discussed how ChatGPT™ can contribute to adaptive learning of the English language, being applicable to conversation and integration in teaching platforms. It is

emphasized that ChatGPT™ is a tool that offers personalized learning experiences, which can even be implemented in the context of public schools[7].

In the medical field, ChatGPT™ has also been tested and applied to education. It was found that ChatGPT™ presented good performance and agreement on the United States Medical Licensing Exam, with the provision of responses consistent with clinical cases presented in this exam[8]. Thus, it could be concluded that ChatGPT™ can be a valuable tool for medical students during the pre-clinical curricular phase of the course, providing support for clinical decision-making, as well as improving the skills of future doctors regarding communication about the concepts of common diseases[9].

In this study, it was found that ChatGPT™ relates risk factors for the disease and provides consistent responses about the final diagnosis of the case. Research on the applicability of artificial intelligence tools in Dentistry has already indicated the various functionalities of the chatbot, whether in the detection of dental and maxillofacial anomalies or in reducing the workload through the automation of tasks[10]. In teaching, ChatGPT™ can also assist students and professors in writing scientific texts, due to its speed and ease of gathering information[11]. However, this process should be cautiously analyzed, as ChatGPT™ may present incorrect and plagiarized information, requiring verification of the information and the use of plagiarism detectors[2].

It is important to emphasize that while these technologies can act as support in teaching, providing fast and accurate information, it is necessary to distinguish information that is not true. This is one of the many limitations of ChatGPT™ [3], as described in the experience reported in this study, where the tool itself emphasizes its limitations in providing accurate diagnoses. Furthermore, despite Alexa's limitations in providing detailed and specific responses, the integration of ChatGPT™ provided a more robust and informative approach to clinical case discussion with students in the classroom. The implementation of an API that allows communication between these tools could represent a significant advance, further facilitating the use of these technologies in the educational environment. The integration of the ChatGPT™ API with other tools has already been discussed in another study, where positive results were obtained for stimulating creativity and problem-solving skills in students[12].

ChatGPT™'s ability to provide diagnostic hypotheses and associate risk factors, such as smoking and alcoholism, with the development of specific diseases, was a key point of the experience, positively surprising professors. The use of ChatGPT™ in the classroom has proven to be a tool with potential to transform the teaching and learning dynamics, although limitations and restrictions on its use are necessary. The experience reported contributes to the discussion on the role of artificial intelligence in education, highlighting both its potential applicability and the need for caution regarding its use.

Conclusion

The prospects for the use of AI, whether true or not, in the health area are already a reality and have shown to be promising in both academic and clinical environments. The experience reported proved to be beneficial for all involved, given the opportunity to integrate and understand how a language model tool such as ChatGPT™ can help in raising diagnostic hypotheses in areas such as Stomatology. It is important to emphasize that such a tool should never be used as a substitute for the diagnostic hypotheses listed by a health professional, who has vast experience and clinical expertise, making them much more capable and reliable for such a task. Furthermore, since ChatGPT™

does not offer concrete sources or references, its responses should be viewed with a certain amount of suspicion, and it is more appropriate to confirm its findings in virtual health books and libraries.

However, it is also important to recognize the contribution that its use can make to clinical and academic life, not only as an aid in diagnosis, but also as a source of information about contraindications, treatment plans and prognosis. Finally, ChatGPT™ integrated with Alexa has great value as a tool to assist in active teaching methodologies, acting as a facilitator in the daily lives of students and professors in Dentistry and other health areas, accelerating the pace of classroom discussions, in addition to enriching them with good quality content. The future undoubtedly looks promising for this tool and others like it.

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