

# CHATGPT IN THE CONTEXT OF HIGHER EDUCATION: THE CASE OF ITS APPLICATION IN A CURRICULAR UNIT

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## Abstract

In recent years the use of AI tools, particularly ChatGPT, has been widespread. In education, students tend to be attracted to their use. The use of these kind of applications in education field divides opinions: some defend the use of these tools; others feel threatened by them. In recent years, several studies have been carried out to assess students' perceptions of the use of AI tools and ChatGPT in particular. Despite this, little work has been done to produce guidelines for the use of ChatGPT by teachers and students, particularly those that emphasize the need to use it critically, ethically and with the ability to check bibliographic sources. Taking this into account, this work aims to contribute to the bridging of this gap. In this paper we present the case of a task carried out as part of a course unit in which the use of ChatGPT was not only allowed but encouraged, by providing guidelines for students to overcome helping them to use the tool constructively. We also asked the students to comment on the work carried out and the use of ChatGPT. A content analysis was carried out and the results are presented here. Results showed that students were motivated to carry out the task and understood that its widespread use requires critical thinking and compliance with ethical principles. The teacher acknowledged that students developed some competences while performing this task and, in general, were able to deliver a quality, well supported essay. These competence developments were also self-identified by some students.

Keywords: ChatGPT, higher education, students' perception, artificial intelligence.

## 1 INTRODUCTION

In 2022, the emergence of ChatGPT brought the use of AI tools into everyday life, which until then had only been accessible in very specific technological contexts. Unsurprisingly, this and other platforms soon began to spread and have millions of users [1]

In education, especially in higher education, their use has brought mixed feelings. On the one hand, there are those who see its use as a great opportunity to enhance the way students access knowledge and carry out their academic tasks [2], [3]; improve student performance as as increasing motivation and engagement in academic activities [1], [4], [5], [6]; help students' preparation for their assessment activities, such as exams, but also in research activities and writing academic papers [3]. On the opposite side are those who see the use of these tools in educational context as a threat, arguing that the results are unreliable (in particular, the fact that ChatGPT fabricates results and only presents data until 2021) and that there are ethical issues associated with their use [3]. This lack of consensus on the advantages and disadvantages of using AI tools in education has led to different reactions from Higher Education Institutions, ranging from total opposition to encouraging their use [1], [2]. Pradana and collaborators [2] state that it is the responsibility of education to find a way of using AI tools that will enable it to improve the educational system while preserving the human touch and interpersonal communication skills that are fundamental to the transfer of knowledge.

The opinion of students on the use of AI tools in education has been a major target of interest for researchers. In recent years, several studies have attempted to assess the perception of higher education students of the use of AI tools in education [4], [6], [7], [8], [9], [10]. In general, studies point to the fact that students realize the potential of ChatGPT, sometimes perceiving it as a robust tool, a 'know-it-all machine' as Ding and colleagues put it [4], which raises some concerns on the part of teachers and researchers. What is a consensual for researchers is the high level of motivation that students point to when using of this and other AI tools, which may indicate that the use of these tools can help increasing motivation for academic activities. Some authors also warn that students are unaware of the risks of using ChatGPT or that they are too optimistic when assessing the disadvantages of using this tool [9], [11].

Therefore, it seems inevitable that chatGPT and other AI tools will be used on a massive scale in education, especially in higher education. In this sense, it's important to define strategies to help students to use these tools carefully, particularly with special attention to the quality and reliability of the

bibliographic sources and the ethical aspects of their use. In this context, as part of a course in the Computer Engineering degree, we invited students to carry out an academic work that encouraged the use of ChatGPT and a mandatory consequent validation of the information obtained using bibliographic sources. This, in our opinion, allows to show students that the use of the tool is possible if there is a critical spirit, concern for ethical issues and validation by bibliographic references. With the objective of evaluating students' perception of the work, we also asked students to comment on the work carried out and the use of ChatGPT.

## 2 METHODOLOGY

In this section we will present the assignment carried out as part of the Organizational Behaviour course in the third year of a degree in Computer Engineering at a Portuguese Engineering School and we will describe the study we carried out after the assignment was concluded.

The course of organizational behavior had 260 students enrolled, to whom the optional work was requested. 86 students responded affirmatively to this request, which corresponds to about 33% of the enrolled students.

Each student would have to choose a theme from those outlined in the course program. After choosing the theme, students would have to perform the following tasks:

- 1 Prepare 5 questions on the subject to ask ChatGPT;
- 2 After obtaining ChatGPT responses, validate this information by a bibliographic research, verifying the veracity of the information collected through its comparison with credible and reliable bibliographic references.
- 3 Write a final essay that includes the information collected through ChatGPT and validated through information research. This final text is expected to present the validated information in-depth with credible and reliable bibliographic references.

After the assignment, students were invited to respond to a mixed questionnaire. This questionnaire was composed by 5 Likert questions (analyzed in another work, still in progress) and the follow open question: "What was your opinion about this assignment?".

We present in the following the qualitative results, both from the teacher perception and of this open question.

## 3 RESULTS

The qualitative analysis, which is defined as a set of techniques for analyzing communications through systematic and objective procedures for describing the content of messages [12], was used to treat the results of this open question.

First of all, is important to begin with the teacher perception. From the teacher's point of view, generally, the students' work fulfilled the intended objectives, and more than 50% of them were well structured and had a final rehearsal based on credible bibliographic references. The teacher perception of the students' usage of the ChatGPT was that the majority understood that ChatGPTs' results should not stand on its own and should be corroborated by other resources. In terms of the learning outcomes, the teacher considered the assignment fulfilled the objective of showing students that the use of the AI tool can be useful if it is done in a judicious way, based on credible references, and complying with appropriate ethical concepts.

Regarding the results obtained, since the question was mandatory, 50 valid answers were obtained. From the content analysis performed emerged 5 categories of responses. It is important to mention that each student could have remarks in several categories, and sometimes more than one in the same category.

The first category that has the largest percentage of answers (89%) is related to remarks about the assignment. In this category we obtained 47 remarks made by students, mostly of them positive. 16 students evaluated the work as a "Good (Initiative, Work, Idea, etc.)"; 12 considered it "Interesting"; 5 students referred to work as considering it "Different/Original"; 6 classified it as "Useful/ Enrichment"; 3 students considered him "Challenging"; and 2 used the adjective "Important" to classify it. Despite such a positive assessment, it is noteworthy that three students expressed more negative feeling towards this task: "It shouldn't be possible to choose a topic that has a yet covered in class" (2 Students); "Extremely tiring and labor-intensive" (1 Student).

In the second category, with 43% percentage of answers – include observations about Acknowledge Achievements. This category points to the capability to identify two major achievements while performing this assignment: 14 Students reported that the work allowed them “Learn More/ Better (the content of the topic)”; and 7 referred to the fact that they had “Learn to (productively) use ChatGPT”. One student acknowledge that assignment contributed to his “Personal Development” and another student expressed “Combining subject matter with creativity”.

34% of the answers were inserted in category 3 that referred to students' thoughts about the usage of ChatGPT. In this category we can see that most students value the use of ChatGPT. However, we have to emphasize the existence of one response that expressed some reservations about the use of the tool, highlighting its limitations in terms of reliability. In this category, 5 students reported that the work allowed them to “Read to use the ChatGPT”; 4 Students reported that it was an opportunity for “Understand it's reliability”; 3 students reported that the work allowed “Understand its most-values” and another 3 reported that with the task they “Understood its capacities/ limitations”; Finally, 3 students referred to the fact that they allow them “Embrace new tools/ future/ technology”.

25% of the students' answers are included in category 4 and denoted strategic thinking. For example, 9 students directly said that this assignment could allow them to “Improve their grade”, 3 others expressed the acknowledgment of “Reward” for the extra work and one confessed “I was going to use ChatGPT anyway...”, assuming their strategic thinking of using an AI tool from the beginning.

The last category is related to identification of competences developed. Is important to emphasize that some students were able to identify some competence developed while doing this task. 4 students identify the “Critical Thinking”; 2 students the ability to “Validate Information”; 1 student the capability to “Link Concepts”; and 3 students refer the competence to “Gather useful information”.

## 4 DISCUSSION AND CONCLUSIONS

In this paper we assume the idea that it will be difficult to stop the use of AI tools like ChatGPT in education. Even though their use should be guided to meet quality and ethical criteria and accompanied by the validation of information through bibliographic research, respecting the authorship of concepts and ideas. As referred in the literature, ChatGPT is a facilitating tool, which allows to quickly carry out repetitive and uncreative tasks, in which the human factor is not differentiating. Higher education institutions and their teachers, as mentioned by Pradana and collaborators [2], ought to take responsibility for supporting their students, teaching them to use it in an ethical, judicious way.

Baring this in mind, the objectives of the task proposed to the students implied the use of this tool with specific indications. It demonstrates to them that they can use ChatGPT but follow a set of rules that would allow them to produce a credible and a reliable final essay, respecting the authorship of ideas and concepts. Results demonstrate that students understood these objectives. In their responses to the open-ended question, we observed that:

- 1 Students felt motivated to carry out the work that they characterized with the use of adjectives such as “Good”, “Interesting”, “Enriching”, “Useful”, and “Challenging”. This is an important aspect since the use of the tool can contribute to increasing students' motivation to carry out school tasks, as previously advocated by many authors. [1], [4], [5], [6].
- 2 Students were able to identify major achievements while performing this assignment, namely achievements that were related to learning about the theme of the work, but also to how to use the ChatGPT. If we associate this with the fact that many students value the use of ChatGPT, considering that the work was an opportunity to learn how to use the tool, understand its added value and reliability, we can conclude that the pedagogical objective of this work - to train students to use ChatGPT judiciously – has indeed been achieved.
- 3 We should not ignore the fact that some students were aware that this work allowed them to develop skills such as critical thinking, cchecking information through bibliographic references, the ability to link concepts and to gather useful information.

According to the experience obtained in this work and the literature review carried out, we can suggest some guidelines that support teachers in using ChatGPT within the scope of academic work:

- 1 First and foremost, teachers must be familiar with AI tools and recognize their capabilities and limitations.

- 2 Students are naturally motivated to use AI tools in their work. However, they are not always aware of the risks of using them. Therefore, teachers must take this aspect into consideration in the statements they produce and value the validation of information through bibliographical research.
- 3 Students must be alerted to the need to comply with ethical precepts such as, for example, those related to authorship. Therefore, teachers must include this aspect in the evaluation of the work they do.
- 4 Students should be advised to double check the information provided by AI tools. The paradigm must be “use it, with caution” and with the objective of learning, not as a substitute of hard work.

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