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Article

Artificial Intelligence Use in University: Should We Ban ChatGPT?

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Abstract: Artificial Intelligence (AI) play an important role in many fields, including medical education, practice, and research. Many medical educators started using ChatGPT at the end of 2022 for many purposes. The aim of this article was to explore the potential uses, benefits and risks of using ChatGPT in integrated pharmacotherapy of infectious disease module education. This study was an experimental study with content analysis of the potential applications of the ChatGPT model for integrated pharmacotherapy of infectious diseases module education was performed. The findings of this study shows that there are many potential uses, benefits and risks associated with the use ChatGPT. In conclusion, medical and health sciences educators can use ChatGPT as a guide in many aspects related to the integrated pharmacotherapy of infectious disease curriculum development, syllabus design, lecture notes preparation and exam preparation with caution.

Keywords: innovation and technology; quality education; sustainable communities; innovation and infrastructure; partnerships for the goals; sustainable education; social justice

1. Introduction

Artificial Intelligence (AI) play an important role nowadays than at any time in history in many fields, including medical education, practice and research [1-6]. Artificial Intelligence can be defined as the " It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable" [7], or as "a field of science and engineering concerned with the computational understanding of what is commonly called intelligent behaviour, and with the creation of artefacts that exhibit such behaviour" [8]. One of the recent advanced in the artificial intelligence development is the launched of a model called ChatGPT which interacts in a conversational way. The dialogue format makes it possible for ChatGPT to answer follow-up questions, admit its mistakes, challenge incorrect premises, and reject inappropriate requests; ChatGPT is a general Large Language Model (LLM) developed recently by OpenAI. While the previous class of AI models have primarily been Deep Learning (DL) models, which are designed to learn and recognize patterns in data, LLMs are a new type of AI algorithm trained to predict the likelihood of a given sequence of words based on the context of the words that come before it [9]. Many educators, researchers, healthcare professionals and students started using ChatGPT at the end of 2022 for many purposes, such as preparing lecture notes, assignments, literature reviews and others. The objective of this article is to explore the potential uses, benefits and risks of using ChatGPT in integrated pharmacotherapy of infectious disease module education.

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2. Materials and Methods

2.1. Study Design

A content analysis of the potential applications of the ChatGPT model for integrated pharmacotherapy of infectious diseases module education was performed.

2.2. Data collection

The research was conducted between 05 January 2023 and 05 February 2023 to explore the potential uses, benefits and risks of using the ChatGPT model for integrated pharmacotherapy of infectious diseases module education:

Questions related to the curriculum were asked to explore the ability of ChatGPT to answer them; the questions were divided to the following themes:

Theme 1. Questions related to the development of the integrated pharmacotherapy of infectious diseases module curriculum as suggested by Thomas et al., 2022 in the six steps for the development of medical education curriculum [10]:

Step 1: Problem Identification and General Needs Assessment
Step 2: Targeted Needs Assessment
Step 3: Goals and Objectives
Step 4: Educational Strategies
Step 5: Implementation
Step 6: Evaluation and Feedback
Note: Step 5 was not included

Theme 2. Questions related to the syllabus for each topic, such as integrated pharmacotherapy of respiratory tract infections.

Theme 3. Questions related to the preparation of lecture notes related to each topic, such as integrated pharmacotherapy of respiratory tract infections.

Theme 4. Questions related to the preparation of exams with model answers related to each topic, such as integrated pharmacotherapy of respiratory tract infections.

2.3. Data Analysis

Three professors with long experience teaching integrated pharmacotherapy of infectious disease modules and curriculum independently evaluated the answers by ChatGPT and rated the appropriateness and accuracy of each question as a percentage out of 100; the average of three professor evaluations was considered in this study. Moreover, they were asked to comment on the potential uses, benefits and risks of using ChatGPT in integrated pharmacotherapy of infectious disease module education.

2.4. Ethics Consideration

This project protocol was assessed and exempted for ethics approval by the Research Committee of College of Medical Sciences, Azal University for Human Development.

3. Results

Theme 1. The ability of ChatGPT to design the integrated pharmacotherapy of infectious disease module curriculum

Step 1: Problem Identification and General Needs Assessment

Analysis of the expert's opinion shows that ChatGPT was able to describe the need for the integrated pharmacotherapy curriculum in general for healthcare students; however, ChatGPT was unable to describe the importance of integrated pharmacotherapy of infectious disease, ChatGPT was able to describe the problem of antibiotics resistance. In general, the average of experts' rates appropriateness and accuracy was 65%.

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Potential benefits

ChatGPT can help medical and health sciences educators about the importance of integrated pharmacotherapy curricula from the literature review.

Potential risks

ChatGPT can't describe the problem and general needs assessment to a specific population.

Recommendations

Medical and health sciences educators can use ChatGPT as a guide for understanding what is reported in the literature, then, they should be able to understand the problem and general needs assessment related to their countries with other methods.

Step 2: Targeted Needs Assessment

Analysis of the expert's opinion shows that ChatGPT was able to design a general initial questionnaire to use for the feasibility study of the integrated pharmacotherapy; however, ChatGPT was unable to design a specific questionnaire related to the integrated pharmacotherapy of infectious disease. Analysis shows that ChatGPT was not able to design a qualitative study too. The average of experts' rates of appropriateness and accuracy was 50%.

Potential benefits

ChatGPT can help medical and health sciences educators to design a quick questionnaire to be used for the feasibility study.

Potential risks

There are many steps to design valid and reliable questionnaires or qualitative interviews, which ChatGPT will not be able to do it.

Recommendations

Medical and health sciences educators can't use ChatGPT to develop valid and reliable questionnaires and qualitative interviews.

Step 3: Goals and Objectives

Analysis of the expert's opinions shows that ChatGPT could design the goals for the integrated pharmacotherapy of infectious disease curriculum; the average of experts' rates appropriateness and accuracy was 92%. Analysis of the expert's opinions shows that ChatGPT could design general objectives for the integrated pharmacotherapy of infectious disease curriculum; the average of experts' rates appropriateness and accuracy was 80%.

Potential benefits

ChatGPT can help medical and health sciences educators to design goals and objectives for the integrated pharmacotherapy of infectious disease curriculum.

Potential risks

The suggested goals and objectives by ChatGPT could not be specific and could not cover all learning objectives/outcomes domains.

Recommendations

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Medical and health sciences educators can use ChatGPT as a guide for preparing goals and objectives related to the integrated pharmacotherapy of infectious disease curriculum.

Step 4: Educational Strategies

Analysis of the expert's opinions shows that ChatGPT could help in educational strategies; the average of experts' rates appropriateness and accuracy was 75%.

Potential benefits

ChatGPT can help medical and health sciences educators with educational strategies.

Potential risks

The suggested educational strategies by ChatGPT could not be completed.

Recommendations

Medical and health sciences educators can use ChatGPT as a guide in the educational strategies related to the integrated pharmacotherapy of infectious disease curriculum.

Step 5: Evaluation and Feedback

Analysis of the expert's opinions shows that ChatGPT could help suggest suitable evaluation and feedback; the average of experts' rates appropriateness and accuracy was 85%.

Potential benefits

ChatGPT can help medical and health sciences educators with evaluation and feedback methods.

Potential risks

The suggested evaluation and feedback by ChatGPT could not be completed, applicable in some universities.

Recommendations

Medical and health sciences educators can use ChatGPT as a guide in the evaluation and feedback related to the integrated pharmacotherapy of infectious disease curriculum.

Theme 2. Questions related to the syllabus for each topic, such as integrated pharmacotherapy of respiratory tract infections.

Analysis of the expert's opinions shows that ChatGPT could help in the syllabus design; the average of experts' rates appropriateness and accuracy was 70%. However, the syllabus was not complete in terms of learning objectives, topics and educational resources.

Potential benefits

ChatGPT can help medical and health sciences educators to design the lecture notes of integrated pharmacotherapy of infectious disease curriculum with caution.

Potential risks

The suggested lecture notes by ChatGPT could not be completed and missed many important issues.

Recommendations

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Medical and health sciences educators can use ChatGPT as a guide in preparing the syllabus related to the integrated pharmacotherapy of infectious disease curriculum.

Theme 3. Questions related to the preparation of lecture notes related to each topic, such as integrated pharmacotherapy of respiratory tract infections.

Analysis of the expert's opinions shows that ChatGPT could help in lecture notes preparation; However, the lecture notes were not complete, and the suggested learning objectives/outcomes for each lecture were not complete. The average of experts' rates appropriateness and accuracy was 65%.

Potential benefits

ChatGPT can help medical and health sciences educators to design the syllabus of integrated pharmacotherapy of infectious disease curriculum with caution.

Potential risks

The suggested syllabus by ChatGPT could not be completed and missed many important issues.

Recommendations

Medical and health sciences educators can use ChatGPT as a guide in preparing the lecture notes of the integrated pharmacotherapy of infectious disease curriculum.

Theme 4. Questions related to the preparation of exams with model answers related to each topic, such as integrated pharmacotherapy of respiratory tract infections.

Analysis of the expert's opinions shows that ChatGPT could help in exam preparation with the model answers. However, the exams were not covered all the learning objectives/outcomes. The average of experts' rates appropriateness and accuracy was 70%.

Potential benefits

ChatGPT can help medical and health sciences educators to prepare different types of exams with the model answers related to the integrated pharmacotherapy of infectious disease curriculum with caution.

Potential risks

The suggested exams by ChatGPT could not be completed and did not cover the learning objectives/outcomes.

Recommendations

Medical and health sciences educators can use ChatGPT as a guide in preparing the exams of the integrated pharmacotherapy of infectious disease curriculum.

4. Discussion

This study explored the ability of ChatGPT to help medical and health sciences educators in curriculum design, syllabus design, lecture notes preparation and exam preparation. The findings of this study can be classified into three themes:

4.1. Theme 1. Potential benefits of using ChatGPT in the integrated pharmacotherapy of infectious disease curriculum

The findings of this study show that ChatGPT was able to help medical and health sciences educators, especially new educators, in all aspects of curriculum development with caution; the experts rated the curriculum development aspects between 50% in the targeted needs assessment and 92% in the goals suggestions. Therefore, medical and health sciences educators can use ChatGPT as a guide in developing such a curriculum.

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ChatGPT is still in the early phase of use by educators worldwide, and it may be better in the near future to generate all steps related to such curriculum appropriately and completely.

4.2. Theme 2. Potential risks of using ChatGPT in the integrated pharmacotherapy of infectious disease curriculum

The findings of this study show that there are potential risks associated with using ChatGPT in the integrated pharmacotherapy of infectious disease curriculum development, syllabus design, lecture notes preparation and exam preparation, such as missing important learning objectives/outcomes, developing un valid questionnaires and qualitative interviews, type of exam questions and others. There are many limitations of ChatGPT and all technologies; therefore, medical and health sciences educators should be aware of it and use ChatGPT with caution and only as a guide to help them, not rely 100% on it to do all work.

4.3. Theme 3. Recommendations for using ChatGPT in the integrated pharmacotherapy of infectious disease curriculum

ChatGPT can help medical and health sciences educators in many ways; however, they can use ChatGPT as a guide in curriculum design, syllabus design, lecture notes preparation and exam preparation.

5. Conclusion

In conclusion, medical and health sciences educators can use ChatGPT as a guide in many aspects related to the integrated pharmacotherapy of infectious disease curriculum development, syllabus design, lecture notes preparation and exam preparation with caution. Attending training workshops about ChatGPT and AI is very important and highly recommended. Practice ChatGPT in medical and health sciences education is very important and highly recommended to explore the potential uses, benefits and risks as well as suggest recommendations for the best practice.

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Conflicts of Interest: The authors declare that they have no conflict of interest.

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