

THE IMPACT OF CHATGPT-BASED ASSISTANCES ON COMPUTER SCIENCE STUDENTS' LEARNING

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Abstract:

This article explores the impact of ChatGPT-based virtual assistants on computer science students' learning experiences. By enabling interactive conversations and providing instant explanations, these AI-powered assistants enhance understanding, promote problem-solving skills, and offer support in coding challenges. The article discusses both the positive and negative impacts of integrating ChatGPT-based assistants into computer science education.

Keywords: ChatGPT, virtual assistants, computer science, learning, problem-solving, coding challenges.

Introduction

The field of computer science is rapidly evolving, and students face the challenge of mastering complex concepts and practical problem-solving skills. In recent years, the integration of ChatGPT-based virtual assistants has emerged as a promising approach to support computer science students in their learning journey. These virtual assistants leverage natural language processing capabilities to engage in interactive conversations with students, providing instant explanations and guidance. This article aims to explore the impact of ChatGPT-based assistants on computer science students' learning, considering both the positive and negative aspects of their integration.

The Way of Asking ChatGPT to Solve Coding Problems

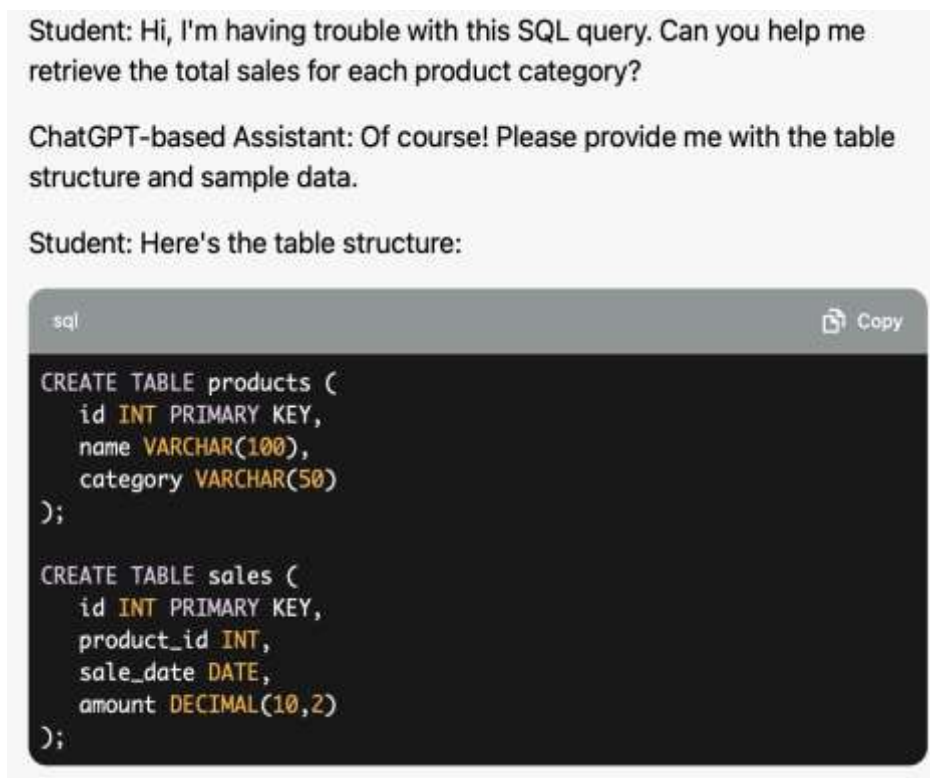
One significant aspect of ChatGPT-based assistants is their ability to assist students in solving coding problems. Students can ask questions, seek guidance, and even request solutions to coding challenges. By providing step-by-step explanations and alternative approaches, these virtual assistants help students understand the

underlying principles and strategies involved in coding. This interactive learning environment not only enhances students' coding skills but also cultivates critical thinking and problem-solving abilities.

Negative Impacts

While ChatGPT-based assistants offer valuable support, there are potential negative impacts to consider. One concern is the over reliance on virtual assistants, which may hinder students' independent thinking and problem-solving skills. Relying too heavily on these assistants could result in a lack of initiative and creativity in finding solutions. Another challenge is the potential for incorrect or misleading information provided by the virtual assistants. As AI models, ChatGPT-based assistants are not infallible and may occasionally provide inaccurate or incomplete responses, leading students astray.

Let's consider a case where a student asks a SQL-based question and the assistant



tries to solve the problem.

And here's some sample data:

```
sql Copy
INSERT INTO products (id, name, category)
VALUES (1, 'Product A', 'Electronics'),
       (2, 'Product B', 'Clothing'),
       (3, 'Product C', 'Electronics'),
       (4, 'Product D', 'Clothing'),
       (5, 'Product E', 'Accessories');

INSERT INTO sales (id, product_id, sale_date, amount)
VALUES (1, 1, '2022-01-01', 100.00),
       (2, 2, '2022-01-01', 50.00),
       (3, 3, '2022-01-01', 200.00),
       (4, 4, '2022-01-01', 75.00),
       (5, 5, '2022-01-01', 30.00);
```

Assistant: Thank you for providing the information. Here's the query to retrieve the total sales for each product category:

```
sql Copy
SELECT category, SUM(amount) AS total_sales
FROM products
JOIN sales ON products.id = sales.product_id
GROUP BY category;
```

In this particular case, the student approached the ChatGPT-based virtual assistant seeking help with an SQL query to retrieve the total sales for each product category. However, the initial response from the assistant provided an incorrect answer that included an additional category not present in the "products" table. This discrepancy arose due to the possibility of sales being made for a product category that was not defined in the "products" table. It is important for students to exercise caution and critical thinking when relying solely on virtual assistants, as discrepancies in the provided results can occur.

To rectify the situation, the correct answer was provided, which involved joining the "products" and "sales" tables based on the product ID and calculating the total sales for each product category. It is crucial for students to validate the table structures, data integrity, and query logic to ensure accurate results when working with SQL queries. By verifying the relationships between tables and double-checking the data consistency, students can confidently utilize the assistance of virtual mentors while also practicing independent thinking and problem-solving to ensure accurate and reliable outcomes.

Despite the potential drawbacks, ChatGPT-based assistants bring several positive impacts to computer science education. These assistants create an interactive and engaging learning environment, where students can ask questions freely without fear of judgment. This encourages active participation and fosters a supportive learning community. Moreover, the instant feedback and explanations provided by the assistants enable students to make immediate progress in their understanding and problem-solving skills. This real-time support contributes to a more efficient learning process.

Improved Accessibility and Flexibility

One notable advantage of ChatGPT-based assistants is their ability to enhance accessibility and flexibility in computer science education. These virtual assistants can be accessed anytime and anywhere, providing students with round-the-clock support. This accessibility eliminates the constraints of time and physical location, enabling students to seek assistance and engage in interactive learning at their own convenience. This flexibility empowers students to take ownership of their learning, accommodating diverse learning styles and preferences.

Enhanced Confidence and Empowerment

By utilizing ChatGPT-based assistants, computer science students can develop a sense of confidence and empowerment in their abilities. The instant feedback and guidance provided by the virtual assistants instill a sense of reassurance, allowing students to navigate complex concepts and coding challenges more effectively. As students witness their progress and growth through the assistance of these virtual mentors, they become more confident in their abilities to tackle future challenges independently. This self-assurance not only enhances their academic performance but also prepares them for professional endeavors in the field of computer science.

Ethical Considerations and Responsible Use

As technology continues to advance, it is crucial to address the ethical considerations and responsible use of ChatGPT-based assistants in computer science education. Educators and institutions should emphasize the importance of using these assistants as learning tools rather than complete solutions. Encouraging students to engage in critical thinking, problem-solving, and independent exploration alongside the assistance of virtual mentors ensures a balanced approach to learning. Additionally, ongoing monitoring and evaluation of the virtual assistants' responses and performance are necessary to maintain the accuracy and reliability of the information provided.

Conclusion

The integration of ChatGPT-based virtual assistants in computer science education has a profound impact on students' learning experiences. From improved accessibility and flexibility to enhanced confidence and empowerment, these virtual assistants offer valuable support in understanding complex concepts and solving coding challenges. However, responsible use and ethical considerations should be at the forefront of their implementation. By striking a balance between utilizing the benefits of ChatGPT-based assistants and promoting independent thinking, computer science education can harness the full potential of AI technology to empower and equip students for success in the ever-evolving world of technology.

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