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School of Computer Sciences

Professional Ethics in Computing (COMP3020)

Submitted: 08/01/2024

Research Question:

Is the increasing reliance on AI in education and everyday life diminishing the critical thinking skills of the younger generations?

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Word Count: 2500

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Is the increasing reliance on AI in education and everyday life diminishing the critical thinking skills of the younger generations?

Abstract

As Artificial Intelligence (AI) becomes an increasing part of education and daily life, concerns arise regarding its influence on the critical thinking skills of younger generations. This plan aims to analyse the intersection between the rising prevalence of AI applications and the development of critical thinking abilities in youth. Combining current research and planned methodologies conducted in our own manner, the analysis explores the potential effects of AI-driven solutions on problem-solving, decision-making, and independent thought. This plan dives into the challenges posed by AI, including the risk of overreliance and the impact on creativity and analytical reasoning. Additionally, it considers potential mitigating factors and strategies for finding a balance between AI integration and the preservation of essential critical thinking skills, based primarily on prior research. By addressing this correlation, this essay plan contributes to a firmer understanding of the evolving dynamics between AI reliance and the development of critical thinking skills in the younger demographic.

1. Introduction

In our rapidly evolving world, AI has continued to insert itself into education and everyday life. As AI's presence grows, so do a variety of concerns regarding the legitimacy of its use in the realm of education. This plan aims to navigate the landscape of AI's influence on the cognitive development of youth, exploring both the promises and problems that emerge.

Supporters of AI in education argue that its integration into learning environments has the potential to significantly enhance the educational experience. The personalised nature of AI-powered tools allows for a level of customisation that traditional teaching methods may struggle to achieve, catering to individual needs and pacing. This adaptability is particularly evident in the specificity that can be programmed into chatbots, surpassing the capabilities of generic search engines. Chatbots, unlike search engines, can engage in dynamic and interactive conversations with students, tailoring responses to unique enquiries and learning patterns. Furthermore, the adaptive nature of AI learning platforms allows for continuous improvement. These platforms can analyse user feedback and criticisms, incorporating insights to enhance their performance over time, aligning more closely with the needs and comprehension levels of the students.

On the other hand, there are a variety of concerns regarding the potential drawbacks of AI integration in education. For some students, the technology is viewed as unfair, providing less proficient peers the ability to generate higher-quality work with minimal effort. This issue arises from the concern that AI tools might unfairly level the playing field, potentially compromising the integrity of academic achievements. Additionally, certain teachers categorise the utilisation of AI-generated content as a form of plagiarism, stressing the contrast between work produced by the student and the work generated by algorithms. As a result, AI-driven solutions, while efficient, might create a passive learning environment, where students become dependent on AI as opposed to simply resorting to it as a helping hand. This perspective reflects the traditional view that academic output should be a reflection of individual effort and understanding. The debate surrounding the perceived unfair advantage underlines the need for careful consideration and ethical guidelines in the integration of AI technologies within educational settings.

As we explore this changing landscape, it becomes evident that striking a balance is imperative. The diversity of opinions surrounding AI in education highlights a form of integration that maximises benefits while addressing concerns. As a result, I believe teachers and students should work together with AI, as if done so correctly, AI will enhance, not diminish, the younger generation's critical thinking skills.

2. Understanding the Impact of AI on Education

Artificial Intelligence was largely considered an unnecessary tool for the younger demographic in education until recent years [5]. The release of chatbots such as ChatGPT has altered this perception, providing students with means to seek assistance with their school work through interactive communication. Whether this should be accepted in today's society has sparked an ongoing debate with the majority being in favour of AI in education [4, 7], and a vocal few raising concerns [1], primarily on issues such as plagiarism [8]. Of course, using AI to help with work, and using AI to do the work are complete polar opposites. In some cases it has been shown that students are able to achieve good results whilst being unfamiliar with a topic, through simply using AI [9]. Our investigation would expand on this research by having students from a variety of age groups do a set of tests, each of a unique subject, where they will be randomly assigned to solely rely on AI, are able to work with AI, or are prohibited from using AI. Conclusively it would allow us to see which approach works best from an objective point of view and see if our findings correlate with prior papers, most of which believe mixing AI into education provides the largest degree of benefits [2, 10]. However, this still presents a broad solution, as determining the extent to which teachers should rely on AI remains a question [6]. Naturally, this concern has as big of an impact on students, as if instructed to heavily depend on AI, several problems may arise, as they could be presented with incorrect information [3], or enter a field later in their lives where AI would not be required, yet they would be reliant on it. This discussion has shown that there is a gap in current knowledge of whether AI and education coincide, which our research aims to address, providing valuable insights into the impacts of AI on students and critical thinking skills.

3. Evaluating the Effectiveness of Students' AI Reliance Versus No AI, and Exploring a Middle Ground

The methodology section will look into understanding students' perspectives on AI in education and evaluating its effectiveness. The data collection approach will be versatile, incorporating surveys to quantitatively indicate students' perceived impacts. This is a reliable method as it achieves a wide-ranging sample size, providing valuable information.

General Views

- ➔ How positively do you view the integration of AI in your educational experience?
(On a scale of 1 to 5, with 1 being strongly disagree and 5 being strongly agree)

Specific AI Experiences

- ➔ How frequently do you interact with AI tools in your coursework?
(Rarely, Occasionally, Frequently, Always)

Impact on Learning

- ➔ To what extent do you believe AI has influenced your overall learning experience?
(Significantly, Moderately, Slightly, Not at all)

Impact on Critical Thinking Skills

- ➔ Rate the believed impact of using AI on your critical thinking skills.
(Enhanced, No Change, Worsened)

Comparison with Traditional Methods

- ➔ In comparison to traditional methods, how effective do you find AI-supported learning?
(More Effective, Equally Effective, Less Effective)

Teachers using AI

- ➔ How well do you think your teachers integrate AI tools into learning?
(On a scale of 1 to 10, with 1 being strongly disagree and 10 being strongly agree)

Overall Satisfaction with AI in Education

- ➔ How satisfied are you with the integration of AI in your educational experience?
(Very Satisfied, Satisfied, Neutral, Unsatisfied, Very Unsatisfied)

Complimenting this, interviews will provide an in-depth exploration of individual experiences and opinions, contributing to qualitative insights.

A variety of questions, targeting different topics will be asked:

General Views

- ➔ What is your overall view of using AI in your educational experience?

Specific AI Experiences

- ➔ How often do you use AI in your coursework?
- ➔ How do you feel about AI being integrated into your learning environment?

Impact on Learning

- ➔ In your opinion, how has the use of AI influenced your learning experience?

Impact on Critical Thinking Skills

- ➔ Have you noticed any changes in the way you approach tasks with the introduction of AI?

Comparison with Traditional Methods

- ➔ How does using AI compare to traditional methods of learning for you?

Teachers using AI

- ➔ Do you think your teachers effectively integrate AI tools into learning?

Benefits and Drawbacks

- ➔ What do you think are the advantages of implementing AI in education?
- ➔ Are there any drawbacks you've experienced or think you will experience with the use of AI?

This combination of quantitative surveys and qualitative interviews forms a robust research design; the surveys capture a wide spectrum of responses, therefore we can identify trends more reliably. Meanwhile, the additional data provided by interviews allows for an in-depth understanding of individual experiences and other factors that may influence perceptions of AI in education. The link between these methods ensures a better understanding of students' perspectives, giving us a more insightful interpretation of the data.

Additionally, a correlational study will be conducted to test the strength of various scenarios, including students using AI exclusively, collaborating with AI, and those without AI assistance. This will be done with various age groups, from ages 16-21 (GCSEs – 3rd year university students), and subjects.

This mixed-methods approach aims to capture the overall opinions of students' interactions with AI in education.

For data analysis, quantitative tools such as Excel will be used to uncover patterns and links within survey data and the correlational study. Using the gathered data, we will be able to format it into a manner that is easy to understand and compare such as bar charts. On the other hand, qualitative analysis software such as NVivo will identify themes and patterns from interview responses.

By combining these methods and analysing the data, our research aims to offer a comprehensive understanding of students' perspectives on AI in education, in an objective as well as subjective manner, providing valuable insights for both researchers and educators.

4. Navigating Ethical Considerations

In guidelines with the AREA-4P Framework, to ensure the ethical conduct of primary research, the **people** participating will be provided with comprehensive information that **reflects** the utilisation of their data and the undergoing **process** e.g. what the tests, surveys and interviews will consist of and how their answers compare with students of their age group. A strong emphasis will be placed on the **purpose** and potential impact of their contributions, and how it could alter teaching and education in the coming years. Additionally, to **anticipate** any issues, the collected data will be treated with strict confidentiality, safeguarding the anonymity of participants. The main reason for this is students may not want to own responsibility due to the fact they may have possibly been prohibited from using chatbots to aid with work. The confidentiality measure of the service **product** is vital, as any breach could introduce bias and compromise the integrity of the research findings. Due to these measures, students would likely be more comfortable to **engage** with our research, giving us more accurate information and a better understanding of the problem. As we progress through our investigation, we will **act** proficiently using the findings and feedback obtained to refine and adapt our research methodologies. This entails being responsive to emerging ethical considerations, adjusting our approach based on ongoing insights, and remaining open to modifying our research plan.

Furthermore, ethical considerations extend to the secondary research phase, where a responsible approach will be adopted. In this context, only peer-reviewed research papers from reputable sources will be utilised as references. This selection criterion ensures that the information incorporated into the study is based on sound methodologies and contributes meaningfully to the research question. By prioritising peer-reviewed literature, the research maintains a commitment to reliability and relevance, upholding ethical standards forged by existing knowledge.

In both primary and secondary research, ethical considerations are key components. Clear communication with participants and the selection of creditable references contribute to the overall integrity of the study, emphasising a responsible and ethical research process.

5. Anticipating the Impact of AI on Critical Thinking Skills

In exploring the impact of AI on critical thinking skills in education, our anticipated findings focus on the potential improvement AI could bring to personalised learning experiences as a result of using it as an educational resource. Furthermore, we will be able to see in which subjects AI performs well in, or poorly, to which educators can take note of and select whether to implement it within their course. We expect to find insights that highlight both positive aspects and ethical considerations, emphasising that if AI were to be implemented in education, it must be done responsibly. At the same time, alternative scenarios might emerge, raising concerns about student dependency on AI and disparities in impact among different student groups, to which our methodologies uncover.

6. Implications of AI Integration for Critical Thinking Skills

As we look into how AI impacts critical thinking skills, it's clear that the mix of technology and education brings both opportunities and challenges. While our research plan lays the groundwork for empirical investigations, the current state of the debate suggests a need for considerations in policy and practices.

Our research plan highlights the adaptable nature of AI's role in education. The findings, once obtained, will contribute to a growing body of knowledge on the effectiveness and ethical considerations of integrating AI tools in the learning environment. This calls for further research into specific aspects, such as the ethical use of AI, long-term impacts on student independence, and the performance of AI in subject-specific matters.

In the rapidly evolving landscape of educational technology, stakeholders, such as students, teachers and educators should take note of the potential implications that arise from AI integration. While AI presents promising avenues for personalised learning and improved accessibility, consideration is needed to address concerns related to student dependency and potential biases. Stakeholders are encouraged to collaborate with one another and researchers, to develop AI solutions that align with educational goals while safeguarding ethical standards.

Policymakers, such as governing bodies and education authorities, should aim at responsible AI integration in education. Clear guidelines are needed to address issues such as ethical considerations, and the appropriate balance between human and AI-driven instruction. Policymakers should collaborate with educators and researchers to ensure fair access to AI tools, how to inject them into learning, and address potential problems in the educational landscape.

Based on the anticipated findings and the principles of Responsible Research and Innovation (RRI), I recommend that educational institutions invest in teacher training programs for effective AI integration. Additionally, the development of ethical guidelines and standards for AI use in education is crucial to mitigate concerns related to biases and overreliance on technology.

7. Conclusion

In conclusion, our research plan looks at the complexity of AI's impact on critical thinking skills, setting the stage for empirical investigations. The ongoing debate surrounding AI in education highlights the need for ethical reflection, and collaboration across research, industry, and policy domains. While our implications yet have no empirical findings, the debate itself highlights the importance of approaching AI integration in education with a commitment to responsible practices.

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