



(RESEARCH)

Exploring Cybernetics Students' Perceptions of AI in Education: A Comprehensive Analytical Study

Ahmed Al Zaidy

Computer Science Master's Science Degree Program
Full Sail University
Winter Park, FL, USA

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Abstract

This study investigates the multifaceted perceptions of cybernetics students toward integrating artificial intelligence (AI) in educational environments. This research uncovers the students' knowledge levels, preferred sources of information, perceived benefits, and significant students through a comprehensive analysis of survey data combined with recent scholarly insights. Detailed visual analyses underscore key trends, offering a clear perspective on how these students view the future of AI in their academic journey. The findings suggest that while students appreciate AI's utility, they express valid concerns about job security and the potential reduction in human engagement. This study contributes critical insights for educators and policymakers aiming to align AI practices with student needs and expectations.

Keywords: Artificial, Intelligence, Education, Student, Perceptions, Cybernetics, Ethics, Policy.

1. Introduction

AI has profoundly impacted various aspects of society, including education. Its application ranges from simple automation to complex adaptive learning systems capable of providing personalized educational experiences [1]. The focus on AI in education stems from its ability to streamline processes, improve learning outcomes, and reduce administrative burdens. However, understanding how students perceive this shift is crucial for integrating AI in a way that enhances, rather than disrupts, the learning process. Cybernetics students, typically more familiar with technological advances, offer unique insights into these trends. This paper presents a comprehensive analysis of survey data collected from cybernetics students, focusing on their perceptions and attitudes toward AI in education. By referring to recent works such as Adhikari [1] and Petraşcu [2], this study aims to provide a balanced view of both AI integration's positive and negative aspects.

2. Literature Review:

2.1 Current Applications of AI in Education: AI technologies have become integral in educational systems, driving teaching methodologies and student engagement changes. According to Adhikari [2], AI applications include personalized learning platforms that adapt to students' individual needs, automated grading systems that save time for instructors, and AI-driven tutoring programs that offer on-demand learning support. These applications help bridge gaps in traditional learning environments by providing scalable, data-driven solutions. However, the pace of AI adoption in education has sparked debates over the balance between technology and human interaction, a recurring theme in AI ethics [1], [2].

2.2 Student Perceptions of AI: Petraşcu's [2] work suggests that student perspectives on AI vary widely based on their familiarity with the technology and its applications. High-achieving students often see AI as a tool to enhance their

* Corresponding author: Author First Last Name

learning, while those with less exposure or lower academic performance may view it skeptically. Adhikari [2] adds that broader social narratives often influence these perceptions, such as job displacement fears and ethical dilemmas associated with AI algorithms. The current study aims to build on these findings by analyzing survey data that reflects these complex views.

2.3 Challenges and Implications: AI's ethical use in education cannot be overlooked. Concerns about algorithmic bias, data privacy, and transparency have been noted in several studies [1]. Adhikari [1] emphasizes the need for policies that ensure fairness in AI-driven educational tools. Without these safeguards, there is a risk of exacerbating educational inequalities or reinforcing biases inherent in the algorithms. This literature review sets the stage for analyzing how these ethical concerns manifest in student perceptions.

3. Methodology:

3.1 Data Source: This study draws on survey data provided by Petraşcu [2], which encompasses responses from cybernetics students regarding their views on AI in education. The survey instrument collected information on AI knowledge, sources of learning, perceived advantages, and potential drawbacks, complemented by demographic details such as year of study and GPA.

3.2 Participant Profile: The dataset included responses from students predominantly in their second year of study, with a balanced gender split and a range of GPAs (6.0 to 9.5). This demographic diversity ensured that the analysis captured a broad spectrum of experiences and perspectives, making the findings applicable to different segments of the student population.

3.3 Analytical Approach: Data analysis involves using descriptive statistics to summarize findings and create visual representations of key insights. For instance, histograms were used to display distributions of self-assessed AI knowledge (Figure 1) and perceived utility of AI (Figure 3). At the same time, bar charts were employed to illustrate sources of AI knowledge (Figure 2). Additionally, correlation tests were conducted to explore the relationship between students' academic performance and their perceptions of AI's benefits and drawbacks.

Figure 1 AI Knowledge Levels

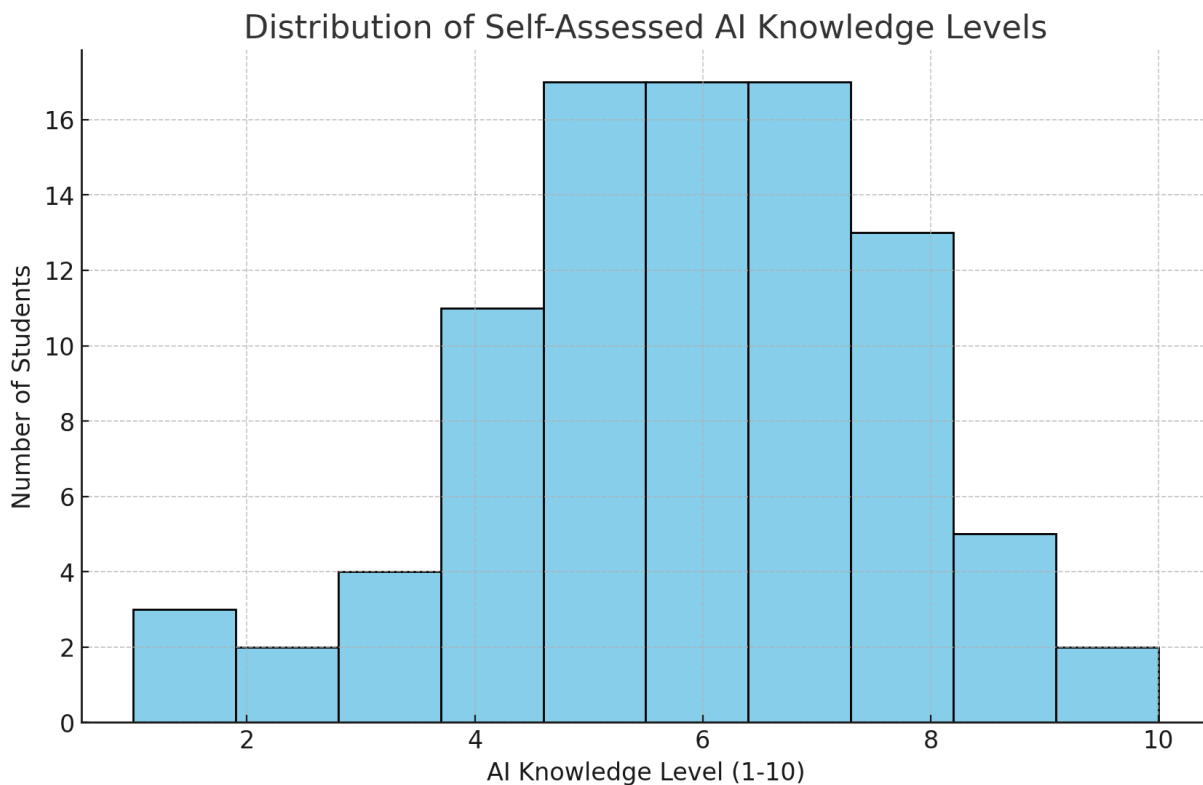


Figure 2 AI Knowledge Among Students

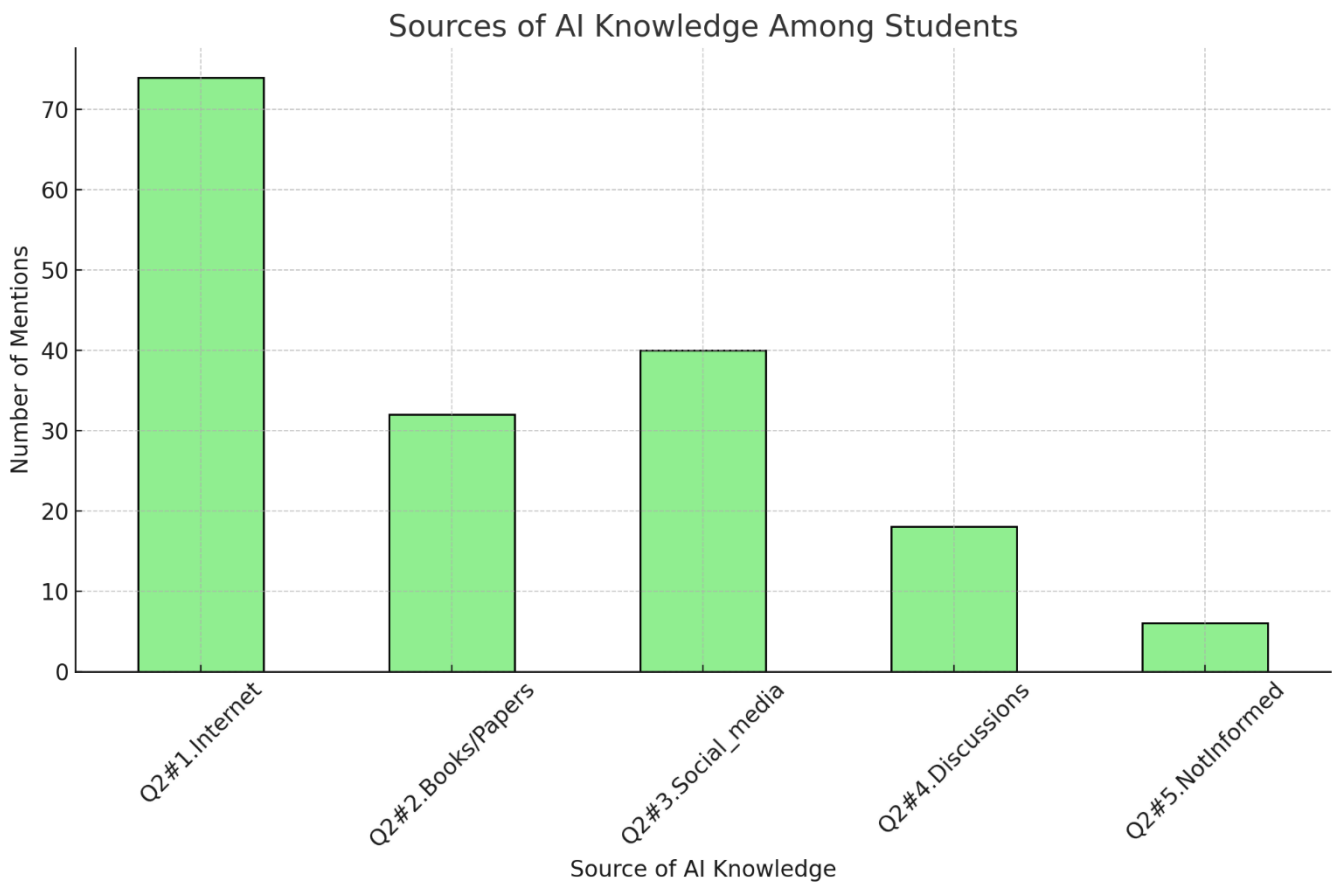
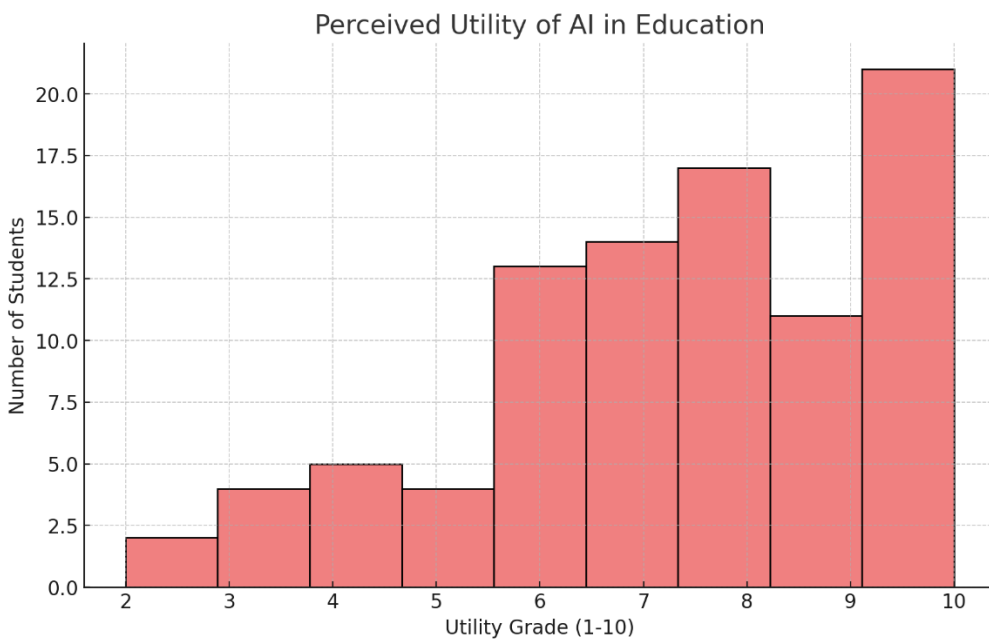


Figure 3 Perceived Utility of AI in Education



4. Results:

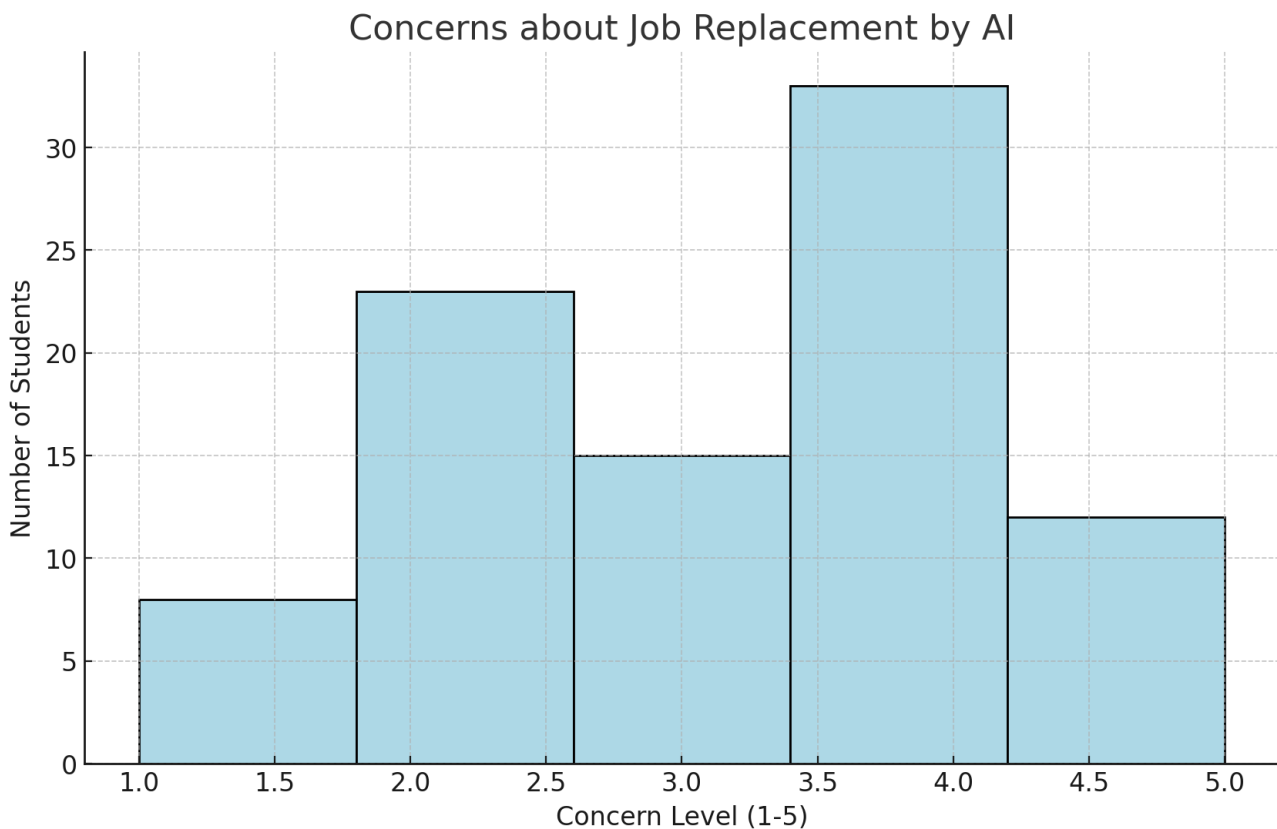
4.1 Distribution of Self-Assessed AI Knowledge: The self-assessed AI knowledge levels among students indicated a moderate to high understanding, with an average score of 6.4 out of 10. This finding, depicted in Figure 1, highlights that most students positioned themselves within the 6-8 range, reflecting confidence in their AI knowledge. This distribution aligns with the technological orientation of the cybernetics field, where students are likely exposed to AI-related topics as part of their curriculum. However, lower scores suggest gaps in knowledge that could be addressed through enhanced coursework or supplementary learning opportunities.

4.2 Sources of AI Knowledge: A significant insight from the survey was the dominance of the internet as a source of AI knowledge. As shown in Figure 2, over 80% of students reported relying on online resources, followed by books and academic papers. This trend points to the importance of digital literacy in contemporary education and the need for institutions to guide students toward credible sources. The reliance on the internet, while beneficial for up-to-date information, raises questions about the quality and accuracy of the knowledge students acquire.

4.3 Perceived Utility of AI: The data revealed that students rated AI's utility in education highly. Figure 3 illustrates that most students assigned a utility score between 7 and 9, indicating an overall positive view of AI's impact on learning processes. The high scores can be attributed to AI's capacity to provide personalized learning experiences, quicker access to information, and more efficient feedback mechanisms. However, the presence of lower ratings signals that some students may not have experienced the full benefits of AI or may have encountered limitations in its application.

4.4 Concerns About Job Replacement: One of the notable concerns expressed by students was the potential for AI to replace human roles, such as teaching positions. Figure 4 shows that nearly half of the respondents expressed moderate to high levels of concern about job replacement. This finding reflects broader societal apprehensions about automation and its impact on employment. Adhikari [2] discusses similar concerns, emphasizing that while AI can support teachers, policies should ensure that it does not undermine the human elements crucial for effective learning. The data suggests that addressing these concerns through open dialogue and transparent policies can help mitigate fear and build trust in AI applications.

Figure 4 Concerns About Job Replacement by AI



5. Discussion:

5.1 Interpretation of Results: The findings show that while students generally recognize the benefits of AI, there are clear areas of concern that need attention. The high self-assessed knowledge scores and reliance on digital sources suggest that students are motivated to learn about AI independently. However, this may also point to gaps in formal educational offerings that could be filled by incorporating structured AI learning modules into the curriculum. The strong perception of AI's utility suggests that AI can be a powerful tool in enhancing the educational experience when implemented effectively.

5.2 Comparison with Existing Literature: The results align with Petraşcu's [2] and Adhikari's [1] work, highlighting AI's dual-natured perception among students. While there is an appreciation for its capabilities, there is concern about job security and the potential dehumanization of learning processes. This study's findings reinforce the importance of integrating AI thoughtfully, ensuring it serves as an adjunct to human educators rather than a replacement.

5.3 Policy Implications: These findings have significant implications for educational policy. Institutions should prioritize programs that teach students not just how to use AI but also how to understand its limitations and ethical considerations. Workshops and courses focusing on AI ethics, transparency, and responsible use can help address concerns and foster a deeper understanding among students. Furthermore, creating platforms for dialogue between students, educators, and policymakers can ensure that AI applications align with students' needs and ethical standards.

6. Conclusion:

This study has comprehensively analyzed cybernetics students' perceptions of AI in education, revealing optimism and caution. While students recognize the benefits of AI in enhancing their learning experiences, there is a significant concern regarding its impact on employment and human interaction. By addressing these concerns and focusing on ethical AI integration, educational institutions can create a balanced approach that maximizes the advantages of AI while preserving the essential human elements of teaching. Future research should explore how these perceptions evolve as AI becomes more embedded in educational practices.

7. References:

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