BOARD # 77: Perception of the Impact of Generative Artificial Intelligence on Education

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Perception of the Impact of Artificial Intelligence on Education

Abstract

This work-in-progress paper explores the perceptions of students and educators regarding the impact of Artificial Intelligence (AI) on education, specifically before and after the release of OpenAI's ChatGPT. Using a mixed-methods survey distributed through online platforms, the study examines participants' adoption patterns, perceived usefulness and ease of use, and ethical concerns. Quantitative data were analyzed using constructs from the Technology Acceptance Model (TAM) and Diffusion of Innovations Theory, while qualitative responses were thematically coded and interpreted through the lens of the Constructivist Learning Theory. Results show that while participants largely view AI tools as useful, accessible, and aligned with modern learning needs, significant concerns remain regarding over-reliance, critical thinking erosion, and academic integrity. The findings reveal the need for structured AI literacy, responsible integration policies, and the design of AI systems that prioritize transparency, personalization, and ethical safeguards. This study contributes evidence-based insights to guide educators, developers, and policymakers in ensuring the ethical and effective adoption of AI in education.

Keywords: Generative AI, ChatGPT, perception, TAM, adoption, education, ethics

Introduction

Artificial Intelligence (AI) has emerged as a groundbreaking technology across industries, and its potential in education is equally promising. It has reshaped how processes are conducted, decisions are made, and interactions are facilitated. AI has demonstrated immense educational potential to revolutionize traditional pedagogies, enhance administrative efficiency, and improve personalized learning experiences. The capacity of AI to process vast amounts of data, identify patterns, and generate insights allows educators to understand student needs better and tailor teaching methods accordingly [1].

The transformative impact of AI in education is evident in its applications across various domains. Adaptive learning systems, for instance, employ algorithms to adjust content delivery based on individual student performance, ensuring an optimized learning experience [2]. Additionally, AI-powered tools, such as virtual tutors and automated grading systems, reduce the administrative

burden on educators, enabling them to focus on more interactive and creative aspects of teaching [3].

Among the most significant advancements in educational AI is the emergence of generative AI, which enables the creation of personalized learning content, automated feedback, and real-time academic support. A notable example is OpenAI's ChatGPT, a large language model trained to generate human-like text responses, assisting students and educators in various academic tasks, including writing, coding, and content summarization [4]. While several generative AI models, such as Google Bard and Anthropic's Claude, offer similar capabilities, ChatGPT is known for its widespread adoption in educational contexts, its advanced natural language processing capabilities, and its frequent integration into learning management systems and academic workflows. These factors position ChatGPT as a leading AI tool in education, making it an ideal case for examining the evolving perceptions of AI in teaching and learning [5].

AI advancements in education bring significant benefits but also raise ethical concerns such as data privacy, algorithmic bias, and transparency. Proper data management is essential to prevent privacy breaches, and addressing algorithmic bias is critical to ensuring fairness and inclusivity for all students. Transparency in AI decision-making is necessary to build trust among educators and learners. Collaborative efforts among stakeholders can establish a framework for the ethical integration of AI, equipping students with skills for an AI-driven future [6].

The advent of generative AI marks a pivotal moment in the evolution of artificial intelligence, characterized by its ability to produce creative and contextually relevant outputs such as text, images, and even code. Among the most notable developments in this domain is OpenAI's ChatGPT, a language model that has rapidly gained prominence due to its advanced capabilities in generating human-like text responses. Built on the GPT architecture, ChatGPT leverages extensive training on diverse datasets, providing coherent, contextually relevant, and highly detailed answers across various fields [7].

ChatGPT's impact on education has been particularly profound, providing students with personalized learning experiences and aiding in productivity, study organization, and task efficiency. It supports academic activities such as writing, text revision, code development, and answering complex questions, positioning itself as an invaluable tool for enhancing teaching and

learning processes. However, concerns such as user dependency, answer reliability, and ethical implications highlight the need for careful integration and promotion of responsible usage to maximize benefits while mitigating drawbacks [8].

Integrating Artificial Intelligence (AI) into education has sparked significant debates. These debates balance its transformative potential against ethical and practical challenges. Advocates highlight AI's ability to personalize learning, particularly benefiting underrepresented student groups, and streamline administrative tasks, allowing educators to dedicate more time to teaching [9]. However, critics emphasize the risks of over-reliance on AI, the potential erosion of critical thinking skills, and the ethical dilemmas associated with AI-generated content [10].

Given these evolving discussions, this study aims to explore students' and educators' perceptions of AI in education, particularly focusing on ChatGPT's role before and after its widespread adoption. By leveraging theoretical frameworks such as the Technology Acceptance Model (TAM) and the Diffusion of Innovations Theory, this research seeks to provide a structured understanding of AI adoption trends, challenges, and opportunities in educational settings.

Research Objectives

1. To analyze the perceptions, adoption trends, and challenges of generative AI in education, focusing on ChatGPT before and after its introduction.
2. To assess the role of perceived usefulness, ease of use, and active learning principles in shaping AI adoption among students and educators.
3. To examine ethical concerns and propose strategies for the responsible integration of AI in education.

Literature Review

Overview of AI in Education

Artificial Intelligence (AI) has become a transformative force in education, enabling enhanced personalization, automation of administrative tasks, and innovative pedagogical methods. The integration of AI into education began with tools like Intelligent Tutoring Systems (ITS) in the

1980s, which provided adaptive learning experiences based on student responses [11]. Since then, the adoption of AI technologies has expanded significantly, encompassing applications such as predictive analytics for student performance, natural language processing for automated feedback, and adaptive learning platforms that customize educational content [12].

A particularly groundbreaking development in AI is generative AI, exemplified by tools like OpenAI's ChatGPT. ChatGPT represents a leap in AI's ability to generate human-like text and provide real-time, context-aware responses. Its applications in education are manifold: offering personalized tutoring, aiding in content creation, and fostering critical thinking through interactive discussions [18]. ChatGPT's deployment in educational contexts raises ethical concerns, such as potential bias, misinformation, and student over-reliance. As noted in [20], generative AI's role in higher education demands careful navigation to maximize benefits while mitigating risks.

Theoretical Underpinnings

Diffusion of Innovations

The Diffusion of Innovations framework [14] provides a lens through which to examine the adoption of AI technologies in education. AI's integration aligns with Rogers's five stages of innovation adoption: knowledge, persuasion, decision, implementation, and confirmation. Early adopters of AI in education—often technology-forward institutions and educators—have embraced tools like adaptive learning systems and ChatGPT for their promise of efficiency and innovation [15]. However, barriers to widespread adoption include limited access to resources, lack of training, and ethical apprehensions.

Studies on AI adoption highlight disparities across regions and demographics. Kim's study [15] emphasizes the need for curricula tailored to local educational needs, particularly in under-resourced areas. Generative AI's rapid evolution has outpaced educators' ability to critically evaluate and integrate these tools, underscoring the importance of fostering an inclusive approach to AI adoption.

Technology Acceptance Model

The Technology Acceptance Model (TAM) posits that perceived ease of use and usefulness significantly influence the adoption of technological innovations [12]. Studies of AI in education

reveal mixed perceptions. While many educators acknowledge AI's potential to enhance learning outcomes, others express skepticism regarding its reliability and ethical implications [16]. Generative AI tools like ChatGPT exemplify this dichotomy, offering unparalleled interactivity but introducing challenges related to academic integrity and verifying generated content [13].

Constructivist Learning Theory

Constructivist Learning Theory emphasizes learner-centered pedagogies that encourage active engagement and knowledge construction. Generative AI, including ChatGPT, aligns with constructivist principles by enabling students to explore ideas, receive immediate feedback, and engage in self-directed learning [17]. ChatGPT can simulate debates, provide writing prompts, and suggest solutions to complex problems, fostering a dynamic learning environment. However, critics argue that over-reliance on AI tools may diminish students' critical thinking skills and reduce opportunities for collaborative learning [13].

Public Perception of AI

Public and stakeholder perceptions of AI in education have received growing scholarly attention. Early studies focused on AI's benefits, such as increased accessibility and personalized learning [18]. However, recent works highlight concerns over privacy, equity, and the ethical use of AI-generated content [20]. Surveys conducted by [16] reveal that while students and educators recognize AI's potential, they remain wary of its implications for academic integrity and job security in the education sector.

Perceptions of AI in education have shifted markedly post-ChatGPT. The model's widespread adoption has amplified debates around its role in shaping educational experiences. Preliminary studies suggest an increased acceptance of generative AI tools among students, who appreciate their efficiency and interactivity [13]. Yet, gaps in understanding persist, particularly regarding the long-term impacts on learning outcomes and the ethical considerations of deploying such technologies at scale [20]. Addressing these gaps is essential to ensure the responsible integration of AI in education.

Methodology

This study employed a mixed-methods survey design to investigate students' and educators' perceptions of generative AI tools in higher education. The survey was structured to reflect constructs from three theoretical frameworks:

Technology Acceptance Model (TAM) informed the design of Likert-scale questions assessing perceived ease of use, perceived usefulness, attitude toward use, and behavioral intention toward AI tools. Diffusion of Innovations Theory was used to segment participants by their AI adoption readiness (e.g., innovators, early adopters, the late majority) using self-reported classifications. Constructivist Learning Theory guided the inclusion of items assessing how AI tools support or hinder independent exploration, critical thinking, and collaborative learning.

The survey consisted of both closed- and open-ended questions, allowing for quantitative analysis through descriptive and inferential statistics and qualitative thematic analysis. A total of 24 respondents participated, comprising both students and educators. The survey was distributed through online platforms, ensuring voluntary and anonymous participation and no incentives were provided.

Both quantitative and qualitative data analysis was conducted. Descriptive statistics such as frequency, simple percentages, and mean as well as pie and bar charts were employed. Thematic analysis was also conducted on open ended questions to categorize the responses.

Results

This section presents the findings of the study, organized into demographic information, quantitative analysis aligned with the Technology Acceptance Model (TAM) and Diffusion of Innovations Theory, and qualitative thematic analysis based on open-ended responses.

Survey Demographics and General Background

A total of 24 respondents completed the survey, comprising students and educators from various academic fields.

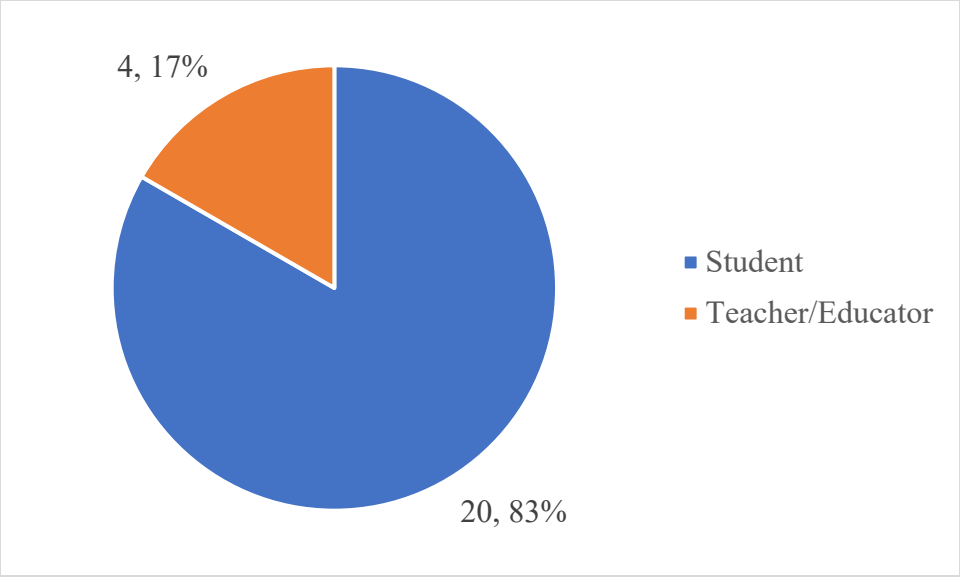

Figure 1: Summary of Study Participants

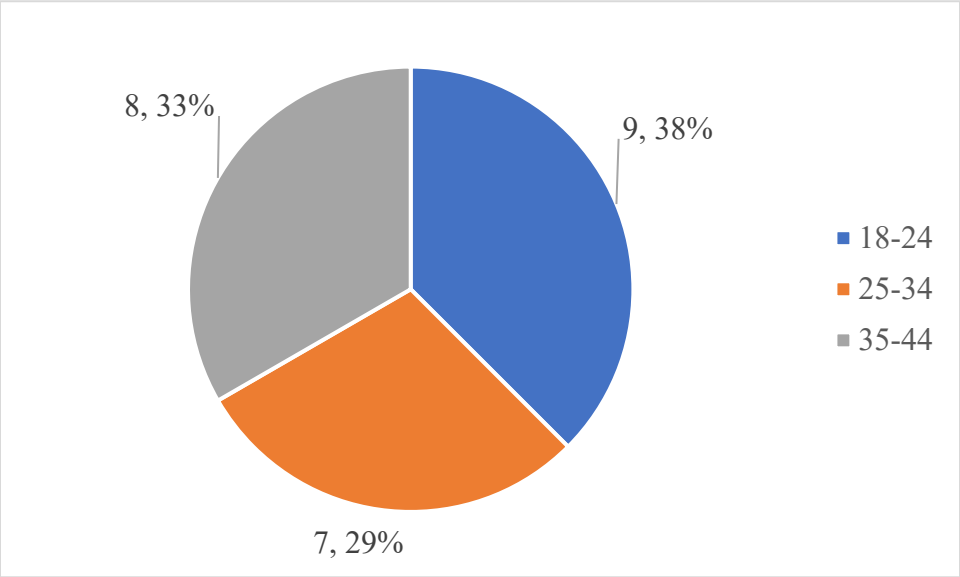

Figure 2: Age distribution of Study participants

Knowledge and Usage of Artificial Intelligence tools in education among Respondents

From the results presented in Table 1, 71% of participants reported moderate to high level familiarity with AI tools. 46% indicated they use AI tools like ChatGPT at least occasionally, with nearly 38% using them frequently. These findings suggest a reasonably high baseline familiarity and engagement with AI tools among the sampled population.

Table 1. Participant Familiarity and Frequency of AI Tool Usage

	Frequency, N	Percentage %
What is your level of familiarity with Artificial Intelligence?		
Somewhat Familiar	7	29.17
Moderately Familiar	7	29.17
Very Familiar	10	41.67
How often do you use AI tools like ChatGPT in educational contexts?		
Never	2	8.33
Occasionally	11	45.83
Frequently	9	37.50
Always	2	8.33

The most common AI tools mentioned by the respondents are Grammarly and Perplexity.

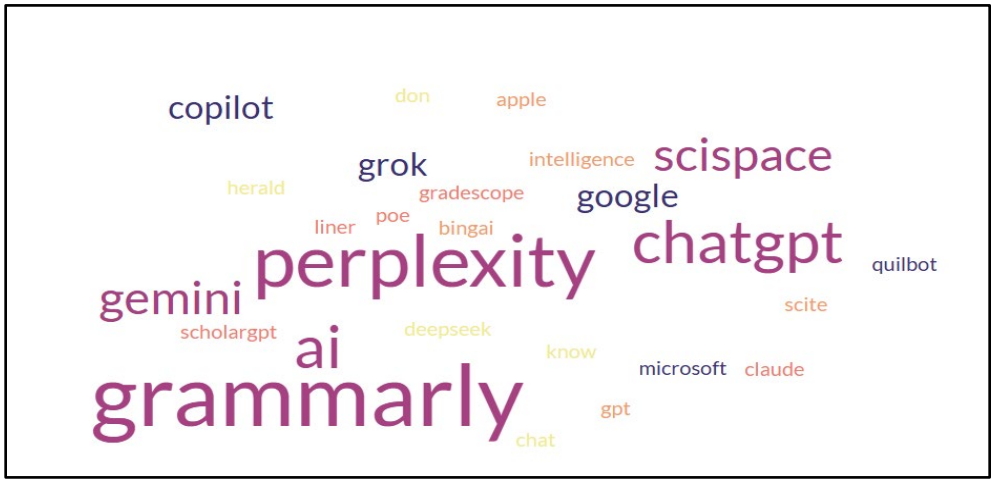

Figure 3: Common Artificial Intelligence tools used by respondents.

Diffusion of Innovations - Adoption Patterns

Participants were asked to rate their willingness to adopt AI tools in educational contexts before the release of ChatGPT, on a 5-point Likert scale (1 = Strongly Unwilling, 5 = Strongly Willing). As shown in Table 2, the majority of respondents (54.17%) selected a neutral position (rating 3), indicating moderate openness to AI adoption prior to their experience with ChatGPT.

Lower levels of willingness (ratings 1 and 2) were reported by approximately 29.17% of participants, while 16.67% indicated higher willingness (ratings 4 and 5). The overall average rating was 2.87. This suggests that respondents were generally cautious or undecided about adopting AI in education before the emergence of ChatGPT.

This finding provides a useful baseline for comparing post-ChatGPT adoption trends and supports the examination of shifts in perception as new AI technologies become more accessible and integrated into educational practices.

Table 2: Prior Willingness to adopt Artificial Intelligence in education

Rating	Frequency, N	Percentage, %
1	3	12.50
2	4	16.67
3	13	54.17
4	1	4.17
5	3	12.50
Average rating	2.87	

Factors influencing decision to use or not use AI tools like ChatGPT in education

Participants were asked to identify the key factors that influenced their decision to use or not use AI tools such as ChatGPT in educational contexts. As presented in Table 3, the most frequently cited factor was perceived usefulness for completing academic tasks, with 54.17% of respondents

selecting this option. This aligns with core constructs of the Technology Acceptance Model (TAM), which emphasizes perceived usefulness as a critical determinant of technology adoption.

Other prominent influences included the ease of understanding how AI tools work (50.00%) and observing others use the tools effectively (45.83%). These findings are consistent with Diffusion of Innovations Theory, particularly the importance of observability and trialability in encouraging adoption. Peer recommendations (37.50%) also played a notable role. This suggests the influence of social networks on user behavior. However, concerns about ethical or privacy issues were identified by 29.17% of respondents as barriers to adoption, while lack of access to AI tools was a relatively minor factor (4.17%).

These results suggest that both practical benefits and social or cognitive enablers drive AI tool adoption in education, while ethical concerns remain a significant but secondary deterrent.

Table 3: Factors Influencing the Decision to Use or Not Use AI Tools

Factors	**Frequency, N**	**Percentage, %**
Perceived usefulness for tasks	13	54.17
Ease of understanding how it works	12	50.00
Recommendations from peers	9	37.50
Lack of access to AI tools	1	4.17
Concerns about ethical or privacy issues	7	29.17
Observing others use it effectively	11	45.83

Self-Classification Regarding AI Adoption in Education

Based on categories from Rogers' Diffusion of Innovations Theory, participants were asked to classify themselves according to their readiness to adopt AI tools in educational contexts. As shown in Figure 4, the majority of respondents identified as Early Adopters (62.5%), indicating a

high level of openness to exploring and integrating new technologies such as generative AI into their teaching or learning practices.

A smaller portion of participants identified as Innovators (8.33%), suggesting a minority of individuals who are typically first to experiment with emerging tools. An additional 12.5% classified themselves as part of the Early Majority, while 16.67% saw themselves in the Late Majority category; typically more cautious adopters who follow once a technology has gained broader acceptance.

These findings suggest that the sample population is largely composed of forward-leaning users, which may explain the generally favorable attitudes toward AI tools observed in other parts of the survey.

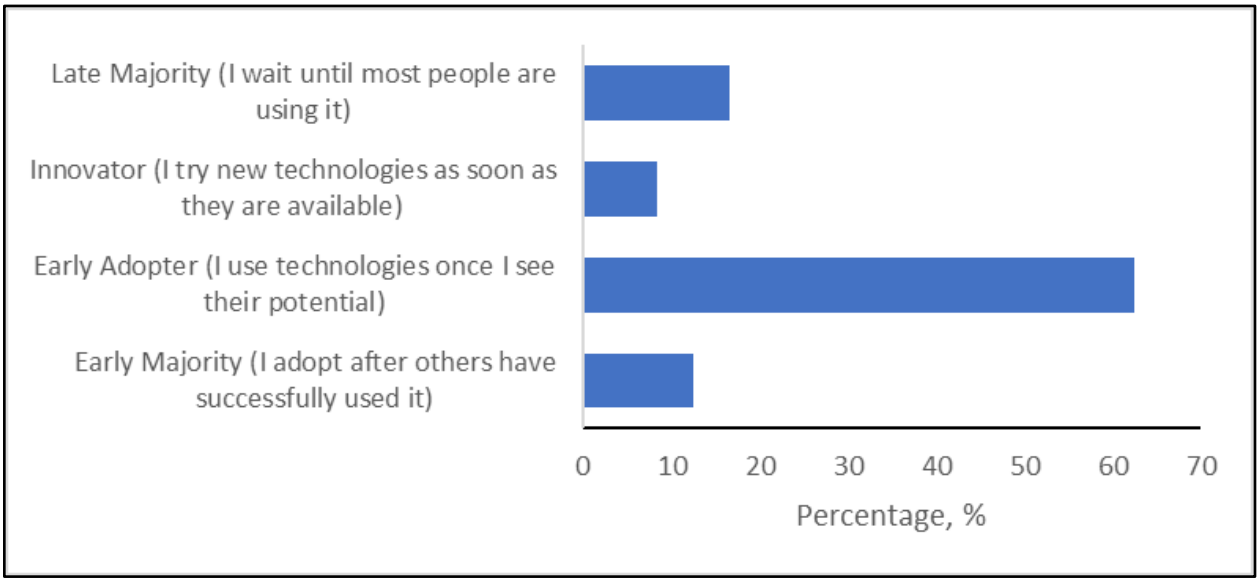

Figure 4: Self-Classification Regarding AI Adoption in Education

Technology Acceptance Model (TAM) - Perceptions and Attitudes

To explore participants' perceptions of AI tools in education, Likert-scale items were used to assess four core constructs from the Technology Acceptance Model (TAM): Perceived Ease of Use, Perceived Usefulness, Attitude Toward Use, and Behavioral Intention to Use. The response patterns are presented in Table 4.

Perceived Ease of Use received overwhelmingly positive responses, with 70.84% of respondents agreeing or strongly agreeing that AI tools like ChatGPT are easy to use. Only 8.33% expressed disagreement, and 20.83% remained neutral. This reflects a general sense of accessibility and user-friendliness. Perceived Usefulness was similarly well-rated, with 62.5% of participants agreeing or strongly agreeing that AI tools are useful in educational contexts. A smaller group (8.33%) disagreed, and 29.17% remained neutral.

For Attitude Toward Use, 66.66% of respondents expressed a positive orientation toward using AI tools in education, suggesting that ease and utility perceptions are translating into favorable attitudes. Again, only a minority (8.33%) disagreed with this sentiment. In terms of Behavioral Intention to Use, two-thirds of respondents indicated that they were likely to continue using AI tools, with 33.33% agreeing and another 33.33% strongly agreeing. A neutral stance was observed among 29.17%, and only one respondent (4.17%) strongly disagreed, indicating a high overall readiness to maintain AI engagement in the future.

These results reinforce the internal consistency of TAM, suggesting that positive perceptions of ease and usefulness are predictive of favorable attitudes and intentions toward AI tool adoption in education.

Table 4: Perceptions of AI Tools Based on TAM Constructs

Constructs	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Perceived Ease of Use	0(0)	2(8.33)	5(20.83)	10(41.67)	7(29.17)
Perceived Usefulness	0(0)	2(8.33)	7(29.17)	12(50)	3(12.5)
Attitude Toward Use	0(0)	2(8.33)	6(25)	11(45.83)	5(20.83)
Behavioral Intention to Use	1(4.17)	0(0)	7(29.17)	8(33.33)	8(33.33)

Challenges in Using AI Tools: Thematic Analysis

Participants were asked to describe any challenges they had encountered while using AI tools such as ChatGPT in educational contexts. A thematic analysis of open-ended responses revealed three primary categories of concern: accuracy and reliability issues, limitations in access and use, and uncertainty or lack of experience.

1. Accuracy and Reliability Issues

The most frequently cited challenge was the inaccuracy and unreliability of AI-generated responses. Participants expressed concerns about receiving incorrect, outdated, or hallucinated information, often highlighting the need to verify outputs manually. Sample expressions included:

> *"Sometimes the information seems out of date",*
>
> *"A lot of answers can be wrong or lack the depth a human connection can have", and*
>
> *"It is not always reliable."*

These concerns suggest a perceived lack of content validity and a potential risk of misinformation, especially when users overly depend on AI-generated outputs without cross-verification.

2. Limitations in Use and Access

Another common theme was restricted access to full functionality, particularly due to paid subscription models. Several participants mentioned dissatisfaction or underutilization because of the cost barriers or lack of experience. Illustrative responses included:

> *"Subscription to full versions," and*
>
> *"Never used."*

These issues highlight concerns about equity and digital accessibility, with some users unable to explore AI tools fully due to financial or technological constraints.

3. Uncertainty or Lack of Experience

A smaller subset of responses indicated uncertainty or non-engagement with AI tools. Phrases such as “None,” “N/A,” and “I can’t say” reflected a lack of direct experience or perhaps a reluctance to provide feedback. This category may reflect lower digital literacy or awareness, or a more passive engagement with AI technologies, and suggests the need for onboarding support and user orientation.

These findings reveal the importance of addressing not only the technical performance of AI tools but also their accessibility, reliability, and the support systems required to ensure informed and equitable use in education.

Constructivist Learning Theory - Active Learning and Engagement

To assess how generative AI tools such as ChatGPT align with constructivist learning principles, participants responded to four Likert-scale items evaluating AI’s support for independent inquiry, conceptual understanding, critical evaluation, and collaborative learning. The results are summarized in Table 5.

1. Independent Exploration and Inquiry

When asked whether ChatGPT supports independent exploration and inquiry, a combined 50% of participants agreed (37.5%) or strongly agreed (12.5%). However, 33.33% remained undecided, and 16.67% expressed disagreement. This indicates a moderate level of confidence in AI’s role in promoting student autonomy, though some participants may still rely on more structured learning approaches.

2. Understanding of Complex Subjects

Responses were more favorable regarding AI’s ability to support understanding of complex concepts. Over 66.67% of participants agreed (37.5%) or strongly agreed (29.17%) with this statement. Only 8.33% disagreed, while 25% were undecided. This reflects strong perceived value in AI tools as learning aids for conceptual clarity and knowledge acquisition.

3. Critical Evaluation of Information

When asked if using ChatGPT encouraged critical evaluation rather than passive consumption, approximately 50% agreed or strongly agreed, while 33.33% were neutral. A small proportion (16.67%) disagreed. These mixed results suggest that while many see AI as a tool to stimulate critical thinking, others may use it in a more transactional or uncritical way.

4. Collaborative or Project-Based Learning

Regarding AI's impact on collaborative or project-based learning, 50% of respondents agreed (29.17%) or strongly agreed (20.83%), while 41.67% were undecided. Only 8.33% disagreed. These findings suggest that although AI is seen as somewhat supportive of group learning, many remain unsure of its collaborative affordances, possibly due to its inherently individualized use.

These results suggest that generative AI tools like ChatGPT are widely viewed as helpful for understanding complex content and partially supportive of active inquiry and critical thinking, aligning in part with constructivist values. However, the relatively high percentage of undecided responses, particularly regarding collaboration and inquiry, may indicate uncertainty about how to meaningfully integrate AI into more interactive, social learning contexts.

Table 5: Perceptions of AI Tools in Relation to Constructivist Learning

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
ChatGPT or similar AI tools supports independent exploration and inquiry in learning.	1(4.17)	3(12.5)	8(33.33)	9(37.5)	3(12.5)
Generative AI tools help me better understand complex subjects	0(0)	2(8.33)	6(25)	9(37.5)	7(29.17)
Using ChatGPT or similar AI tools encourages me to critically evaluate information instead of passively consuming it.	1(4.17)	3(12.5)	8(33.33)	8(33.33)	4(16.67)

How has ChatGPT or similar AI tools impacted your ability to engage in collaborative or project-based learning activities?	0(0)	2(8.33)	10(41.67)	7(29.17)	5(20.83)

Perceived Impact of AI Tools on Active, Meaningful Learning: Thematic Analysis

To assess whether generative AI tools support or hinder active, meaningful learning, participants provided open-ended responses reflecting their personal experiences. Thematic analysis of these responses revealed two dominant themes: (1) Support for learning and comprehension, and (2) Concerns about superficial engagement and critical thinking erosion.

Theme 1: Helps with Learning and Understanding

Many participants described AI tools like ChatGPT as valuable aids in facilitating understanding and academic efficiency. These responses emphasized the ability of AI to simplify complex content, guide study strategies, and accelerate learning processes. Common phrases included:

"Helps break down complex learnings"

"Provides quick access to information"

"Explains difficult concepts after class"

"Enables faster and smarter work"

Some responses also highlighted how AI tools complement technical and disciplinary learning, referencing platforms like QGIS and ArcGIS, where ChatGPT supported task completion and conceptual clarification. This theme also reflects AI's perceived value as a cognitive scaffold that enables students to build understanding, particularly when human support is unavailable or limited.

Theme 2: Hinders Deep Learning and Critical Thinking

In contrast, several participants expressed reservations about AI's impact on deeper learning. These respondents argued that reliance on AI could lead to surface-level understanding, reduced effort, and a decline in critical engagement. Illustrative concerns included:

"Discourages critical thinking and actual study"

"Prevents true learning by doing the work for the user"

"Encourages surface-level learning or quick answers"

"Risk of addiction or overuse"

These reflections echo warnings in the literature that over-dependence on AI tools may undermine constructivist learning principles, where learners actively construct knowledge through exploration, reflection, and problem-solving.

Taken together, these themes highlight a duality in user experience: while AI tools are seen as effective for supporting comprehension and efficiency, they also present risks of cognitive offloading and passivity in learning. This shows the importance of balanced and guided AI use, where learners are empowered to use such tools to enhance rather than replace active engagement with content.

Ethical Concerns Associated with AI Use in Education

Participants were asked to indicate the ethical concerns they associate with the use of AI tools such as ChatGPT in educational settings. As shown in Table 6, the most frequently cited concerns were privacy and data security and plagiarism or academic integrity, each identified by 70.83% of respondents. These concerns reflect anxiety about how user data is collected, stored, and used, as well as how generative AI might enable or obscure dishonest academic practices. Another significant issue raised by 54.17% of participants was the risk of encouraging dependency or diminishing students' critical thinking skills. This concern aligns with broader debates around over-reliance on AI, where tools may be used to bypass deep learning rather than enhance it.

Bias in responses, selected by 41.67% of respondents, was also notable. Participants expressed concern that generative AI might reinforce harmful stereotypes or provide inaccurate, culturally insensitive, or misleading content, especially when used uncritically. Only a small percentage (8.33%) highlighted unequal access to AI tools as an ethical issue. While this may indicate lower awareness of digital equity challenges, it reveals a need to address the inclusivity and accessibility of AI-enabled learning tools.

These findings suggest that while AI tools are widely embraced, users remain deeply concerned about their ethical implications. Educational stakeholders should prioritize the development of clear usage policies, privacy protections, and ethical literacy programs to support responsible AI integration and mitigate risks related to academic misconduct, equity, and learner autonomy.

Table 6: Ethical concerns of respondents

Ethical Concern	Frequency, N	Percentage, %
Privacy and data security	17	70.83
Bias in responses	10	41.67
Encouraging dependency or reduced critical thinking	13	54.17
Plagiarism and academic integrity	17	70.83
Unequal access to AI tools	2	8.33

Integration of Generative AI in Education

Participants were asked whether they believe generative AI tools, such as ChatGPT, are currently being integrated into educational settings in a responsible manner. As shown in Table 7, responses were mixed, with a significant portion of respondents expressing uncertainty.

A plurality of participants (37.5%) selected "Undecided", indicating a lack of clarity or confidence in how AI tools are currently governed or implemented in educational environments. This may reflect inconsistent institutional policies or limited awareness of responsible AI practices. Among those with more definitive views, 29.17% of respondents disagreed (25%) or strongly disagreed (4.17%) that AI is being integrated responsibly, highlighting concerns over issues such as ethical misuse, data privacy, and insufficient educator oversight. In contrast, 33.33% expressed a positive view, with 20.83% agreeing and 12.5% strongly agreeing that integration is currently responsible. This suggests that some participants are observing deliberate and ethical efforts within their educational contexts.

These results suggest that while some users perceive efforts toward responsible AI integration, a substantial portion remains either unconvinced or uncertain. This highlights a pressing need for greater transparency, clearer ethical guidelines, and institutional communication to build trust and promote informed, responsible AI use in education.

Table 7: Perceptions of Responsible AI Integration in Education

Items	**Frequency, N**	**Percentage, %**
Strongly disagree	1	4.17
Disagree	6	25.00
Undecided	9	37.50
Agree	5	20.83
Strongly agree	3	12.50

Recommendations for the Responsible Integration of AI in Education: Thematic Analysis

In response to an open-ended question about how AI tools like ChatGPT can be responsibly integrated into education, participants articulated a range of suggestions. Thematic analysis of these responses yielded four dominant themes: (1) Education and Training, (2) Policy Development and Regulation, (3) Cautious Integration, and (4) Innovation and Collaboration.

1. Education and Training for Responsible Use

The most frequently emerging theme emphasized the need to educate both students and educators on how to engage with AI tools ethically, critically, and effectively. Participants argued that promoting responsible AI use requires digital literacy programs, critical thinking instruction, and explicit guidance on ethical behavior. Representative responses included:

> *"Ways to use it responsibly should be taught and encouraged."*
>
> *"Properly educating the users and ensuring they know how to use it responsibly."*

> *"Help students understand how AI works, its strengths, limitations, and ethical issues."*

This theme aligns with the broader educational imperative to equip users with the cognitive tools to navigate AI's capabilities and limitations, rather than passively consume its outputs.

2. Policy Development and Regulation

A significant number of respondents called for the development of institutional policies and curricular frameworks to guide ethical and pedagogically sound AI use. These responses emphasized the need for transparency, data privacy, and fairness. Examples include:

> *"Create regulations for AI use in education, with respect to fairness, and data privacy."*

> *"Develop curriculum and guidelines for implementation through policies."*

This theme reveals the necessity of formal governance structures to ensure that AI is used in a way that aligns with educational values and protects students' rights.

3. Cautious or Limited Integration

Some participants expressed caution regarding over-reliance on AI tools, emphasizing that AI should serve as a supplementary aid rather than a replacement for human learning processes. Concerns included the accuracy of AI outputs, dependency, and the potential for misuse. Responses included:

> *"We should adapt it carefully but not rely solely on them."*

> *"Make sure it is accurate."*

> *"The usage should be limited or restricted."*

These insights reflect an awareness of the risks associated with AI overuse, calling for deliberate, measured integration strategies.

4. Innovation and Collaboration

Finally, several respondents advocated for collaborative and user-informed AI development, stressing the importance of co-designing tools with educators and learners to ensure relevance and alignment with classroom realities. Sample responses included:

> *"Collaborate closely with teachers and students to make tools that fit their real educational needs."*
>
> *"Use AI as part of the classroom, like the way phones are used."*

This theme suggests a vision of AI as a participatory and embedded component of the learning environment, with human input guiding both its development and deployment.

These findings suggest that responsible AI integration in education requires a multi-stakeholder approach, combining user education, institutional policy, critical oversight, and thoughtful innovation. Balancing opportunity with caution, and flexibility with structure, will be essential to ensuring AI supports rather than disrupts active and equitable learning experiences.

Closing and Future Outlook

Participants were asked to reflect on the future role of AI tools such as ChatGPT in education over the next five years. A thematic analysis of responses revealed three distinct perspectives: (1) Positive transformation and opportunities, (2) Concerns about dependency and learning quality, and (3) Conditional impact dependent on responsible use.

1. Positive Transformation and Opportunities

A majority of respondents envisioned AI tools bringing significant positive transformation to the educational landscape. They highlighted potential benefits such as enhanced personalization, improved accessibility, and greater efficiency in learning. Responses emphasized that AI could support students through tailored learning experiences, 24/7 tutoring, and on-demand content delivery. Examples include:

> *"AI will enhance education and is here to stay."*
>
> *"Make education more accessible, engaging, and efficient."*
>
> *"Provide tailored content to students' needs and pace."*

These responses reflect a strong belief in AI's capacity to augment educational processes and expand learning opportunities, especially through automation and personalization.

2. Concerns About Dependency and Learning Quality

In contrast, some respondents expressed reservations about AI's long-term impact. Key concerns included the potential for reduced critical thinking, diminished creativity, and increased academic dishonesty. There was also apprehension about the risk of over-reliance on AI and its implications for student motivation and teacher roles. For example:

"Could make students lazy or dependent."

"AI might reduce the quality of education due to overreliance."

"Risk of cheating or bypassing real learning."

This theme reveals fears that without proper boundaries, AI could undermine deeper, more meaningful educational experiences.

3. Conditional Impact – Depends on Use

A third, more nuanced view acknowledged that AI's effect on education will largely depend on how it is integrated and governed. These respondents emphasized the need for ethical usage policies, academic integrity safeguards, and intentional curriculum design. Illustrative quotes included:

"If ethically used, it will enhance learning."

"Parameters like plagiarism controls can make it more beneficial."

"Can support learning, but shouldn't replace effort or application."

This theme reflects a balanced perspective, advocating for responsible innovation that complements, rather than replaces, traditional learning values.

These insights reveal an overarching optimism about AI's potential to transform education positively, tempered by legitimate concerns about its misuse. The conditional theme further stresses that the impact of AI will not be uniform, but will depend heavily on implementation

strategies, ethical oversight, and the commitment of educational institutions to support responsible use.

Recommendations for enhancing the design or functionality of AI tools for educational purposes

Participants were invited to suggest ways to enhance the design and functionality of AI tools such as ChatGPT for educational use. Thematic analysis of responses revealed four primary areas of recommendation: (1) Ethical integration and responsible use, (2) Customization and personalization, (3) Accessibility and affordability, and (4) Transparency and verification.

1. Ethical Integration and Responsible Use

Respondents emphasized the importance of ensuring that AI tools are designed and implemented in a way that supports ethical and responsible usage. Key suggestions included embedding ethical literacy into educational practices and ensuring AI enhances rather than replaces human instruction. Examples of comments include:

"Organize seminars on ethical usage."

"Teach students how to prompt effectively and use AI responsibly."

"Design AI to support (not replace) teachers."

These recommendations highlight a strong desire to instill ethical awareness and critical thinking as part of AI use in education, ensuring that AI tools are pedagogically supportive and not misused.

2. Customization and Personalization

Participants suggested that AI tools should be better tailored to meet the diverse learning needs of students and the instructional preferences of educators. Recommendations in this theme included:

"Offer personalized learning based on student pace and style."

"Let educators customize AI outputs, lesson plans, and prompts."

"Provide multimodal support (e.g., visuals, audio, interactive tools)."

These responses reflect a call for AI systems to be adaptive, flexible, and offer differentiated support to diverse learner profiles and align with formal curriculum structures.

3. Accessibility and Affordability

A notable concern was the cost barrier associated with advanced AI tools. Respondents recommended steps to ensure equitable access, especially for underserved populations. Illustrative responses included:

"Make AI tools more affordable and accessible."

"Include offline or low-bandwidth options."

"Expand multilingual and culturally relevant content for global inclusivity."

These insights stress the need for inclusive design strategies that account for technological, economic, and linguistic diversity among users.

4. Transparency and Verification

Respondents also called for greater openness about AI's limitations and sources, suggesting that students should be able to evaluate the credibility of AI-generated outputs. Examples included:

"Disclose sources of responses and acknowledge possible inaccuracies."

"Include AI-detection or verification tools."

"Show students both the strengths and flaws of AI-generated outputs."

This theme aligns with growing calls in AI ethics literature for explainable and accountable AI, especially in domains like education where trust and credibility are paramount.

Altogether, these themes suggest that for AI tools to be truly impactful in education, they must be designed with pedagogical intent, ethical safeguards, and user-centered adaptability. Developers,

educators, and policymakers should work collaboratively to ensure AI systems are not only effective but also inclusive, transparent, and responsibly deployed.

Summary of Findings and Discussion

This study investigated how students and educators perceive the use of generative AI tools, especially ChatGPT, in higher education. Drawing from the Technology Acceptance Model (TAM), Diffusion of Innovations Theory, and Constructivist Learning Theory, the findings paint a clear picture on how most participants find AI tools useful and easy to work with, which leads to positive attitudes and a willingness to adopt them. This mirrors earlier work by Holmes [12] and Mu et al. [16], who showed that perceived usefulness and ease of use are key drivers for tech adoption in education. Interestingly, a significant 62.5% of respondents in this study identified themselves as early adopters, which fits Rogers' Diffusion of Innovations framework [14]. This is in line with Wu's findings [4], which show that many early adopters of ChatGPT are tech-savvy and eager to integrate AI into their learning routines. However, unlike Wu's study, participants here expressed stronger concerns about ethics and reliability—echoing similar caution flagged by Zamir et al. [8] and Gupta et al. [10].

A standout contribution of this research is its look at AI through the lens of Constructivist Learning Theory. While two-thirds of participants felt AI helped them understand complex subjects, around half also voiced concerns about over-reliance and a drop in critical thinking. This dual perspective aligns with observations by Basilio [13] and Sok & Heng [20], who noted that while ChatGPT fosters independent exploration, it can also encourage superficial learning if used carelessly. Ethical concerns especially around privacy, plagiarism, and over-dependence were key themes and are well-supported by the literature. Karagkouni & Sotiropoulou [5] and Silvestre et al. [7] have raised similar issues, emphasizing the need for solid ethical policies. Participants in this study also echoed OpenAI's [6] own stance on the importance of transparency and ethical use.

Another important takeaway was the strong call for institutional policies and digital literacy training. This matches findings by Omene et al. [9], who argue that empowering both students and teachers with the right skills and ethical grounding is crucial for success. One point that stood out in contrast to some earlier studies was that only a small number of participants (8.33%) mentioned unequal access as a concern. This differs from what Holmes et al. [12] found, where digital divides

were highlighted as a major barrier, especially in underserved areas. The results around collaborative learning were mixed: about 50% felt AI supports teamwork, while 41% were unsure. This reflects ongoing debates in the field. Nye [17], for instance, has pointed out that while AI is great for individualized learning, its role in fostering collaboration is still developing.

In summary, the findings reinforce and add nuance to what's already known: AI tools like ChatGPT offer real promise but come with challenges that can't be ignored. The consistency with TAM and Diffusion of Innovations theories confirms their usefulness in studying AI adoption, while the differences from other studies highlight how context matters. For the future, it would be valuable to carry out long-term studies to see how perceptions evolve as AI tools become more advanced, and to explore how these findings play out in different cultural or regional settings

Conclusion

This study reveals that while students and educators hold generally favorable views of generative AI tools like ChatGPT, concerns about reliability, ethics, and learning integrity remain prominent. Most participants perceive AI as useful and easy to use, supporting adoption as described by TAM, while the observed patterns of openness and hesitation align with stages in the Diffusion of Innovations framework. The study also shows that AI can complement constructivist learning when used responsibly, but also poses risks of over-reliance and superficial engagement. Moving forward, educational institutions must focus on ethical integration strategies, clear usage policies, and pedagogical frameworks that promote critical engagement with AI tools.

Future research could involve longitudinal studies to assess changes in perception over time and institutional case studies to evaluate best practices in AI integration across diverse learning environments.

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Appendix

Perception of the Impact of AI on Education - Survey Form

Demographic and General Background

1. What is your role in education? (Student, Teacher/Educator, Parent, Other)

2. What is your age group? (Under 18, 18-24, 25-34, 35-44, 45-54, 55 and above)

3. In which Country are you located?

4. What is your level of familiarity with Artificial Intelligence? (Not Familiar to Very Familiar)

5. How often do you use AI tools like ChatGPT in educational contexts? (Never to Always)

6. Mention any other AI tool(s) you know that serve the education content.

7. Mention any other AI tool(s) you use that serve your teaching or learning needs.

Diffusion of Innovations - Adoption Patterns

8. Before the release of ChatGPT, how would you rate your willingness to adopt AI tools in education? (Strongly Unwilling to Strongly Willing)

9. Which of the following factors influenced your decision to use or not use AI tools like ChatGPT in education? (Perceived usefulness, Ease of use, Peer recommendation, Observing others, Ethical concerns, Lack of access)

10. How would you classify yourself regarding AI adoption in education? (Innovator, Early Adopter, Early Majority, Late Majority, Laggard)

Technology Acceptance Model (TAM) - Perceptions and Attitudes

To what extent do you agree with the following statements about AI tools like ChatGPT or similar in education?

11. AI tools make educational tasks easier to perform. (Strongly Disagree to Strongly Agree)

12. ChatGPT or similar AI tools enhance the quality of learning and teaching outcomes.

13. Using ChatGPT or similar AI tools aligns with my expectations for effective educational tools.

14. How likely are you to recommend ChatGPT or similar AI tools to others in education?

15. What challenges, if any, have you faced in using AI tools like ChatGPT or others? (Open-ended)

Constructivist Learning Theory - Active Learning and Engagement

To what extent do you agree with the following statements about AI and learning?

16. ChatGPT or similar AI tools support independent exploration and inquiry in learning.

17. Generative AI tools help me better understand complex subjects.

18. Using ChatGPT or similar AI tools encourages me to critically evaluate information.

19. How has ChatGPT or similar AI tools impacted your ability to engage in collaborative or project-based learning activities?

20. In your experience, does using AI tools like ChatGPT help or hinder active, meaningful learning? Please explain. (Open-ended)

Ethical and Practical Considerations

21. What ethical concerns do you associate with using AI tools like ChatGPT or others in education? (Privacy, Bias, Dependency, Plagiarism, Access)

22. Do you believe generative AI tools like ChatGPT or others are currently being integrated into education responsibly?

23. What steps should educators, policymakers, and developers take to ensure the responsible integration of AI tools in education?

Closing and Future Outlook

24. How do you envision AI tools like ChatGPT or others transforming education in the next five years?

25. What recommendations would you provide for enhancing the design or functionality of AI tools for educational purposes?

26. Is there anything else you would like to share about your experiences with or opinions on AI tools in education?