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STUDENTS AS CO-CREATORS OF LEARNING: THE ROLE OF ATTITUDE IN THE EFFECTIVENESS OF AI- ENHANCED EDUCATION

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Abstract

As artificial intelligence (AI) increasingly permeates educational settings, its success depends not just on technological advancement but also on student attitudes toward using it. This qualitative study investigates the significance of student attitudes in determining the success of AI-facilitated education with a focus on their engagement as co-creators of the learning process. Basing its analysis on interviews, focus groups, and observational research, the article determines central attitudinal dimensions—e.g., ownership, curiosity, cooperation, and ethical sensitivity—that shape students' uptake of AI tools. The results underscore the necessity of cultivating student agency, critical thinking, and reflective practice to make sure that AI acts as a catalyst for important, student-driven learning. The research concludes that in order for AI-powered education to be genuinely transformational, learners are not only users but should be treated as active collaborators in the development and direction of their own learning journeys.

Keywords: *AI-Enhanced Education, Co-Creation, Collaborative Learning, Critical AI Literacy, Educational Technology, Ethical Awareness in AI, Personalized Learning, Qualitative Education Research, Student Agency, Student Attitudes.*

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1. Introduction

The incorporation of artificial intelligence (AI) in education is transforming the teaching and learning environment, with possibilities for customized learning, intelligent feedback, and adaptive learning spaces (Luckin et al., 2016). AI-facilitated tools like intelligent tutoring systems, recommendation engines, and virtual teaching assistants are finding their way into classrooms, promising to support conventional pedagogies and improve learner achievements (Holmes et al., 2019). Nevertheless, the utility of such technologies cannot be realized through technical efficacy only; it also lies heavily upon how students experience, interact with, and assist in their learning processes via AI.Current education paradigms have focused more on learner-centered practices, wherein learners are not merely receivers of information but active contributors to their learning processes (Bovill, 2020). This change is in line with the idea of learners as co-creators of learning, a paradigm that regards students as working with teachers and technologies to create educational content, processes, and results (Cook-Sather et al., 2014). In terms of AI, co-creation goes beyond content engagement to involve how students navigate through, personalize, and reflect on the employment of AI tools throughout their learning experiences.

Most importantly, the disposition students carry into these AI-facilitated spaces—anywhere from curiosity and openness to resistance and skepticism—takes on a determining role in guiding learning outcomes (Teo, 2011). Attitude influences whether students see the value in AI, whether they are willing to try new tools, and how carefully they scrutinize the feedback and learning pathways proposed by algorithms. Thus, attitude is not an ancillary factor but a focal perspective under which the effect of AI in education has to be grasped.

Additionally, there is an emerging ethical and cultural aspect to AI integration in education. Students are becoming more and more concerned about matters of data privacy, algorithmic bias, and dehumanization of learning (Zawacki-Richter et al., 2019). Whether they are willing to collaborate meaningfully with AI is a function of trust, transparency, and control over how these technologies are implemented. When students believe they have the power to challenge and define the role of AI in their learning, they are more likely to embrace positive, participatory learning roles.

The following paper examines student attitudes as a key determinate of the efficacy of AI-augmented education by reviewing their positions as co-creators within AI-facilitated learning environments. From a qualitative perspective, it explores students' lived experiences in working with AI tools and examines how attitudes of agency, openness, and ethical awareness enable or frustrate meaningful engagement. The results add to an emergent literature that understands the human-AI relationship in education as

two-way, rather than one-way, and dynamic, co-constructed, and dependent on student voice, reflection, and agency.

1.1. Statement of the Problem

Even with growing use of artificial intelligence (AI) in the education sector, most studies continue to address technological potential and results while paying less attention to human aspects that affect the effectiveness, especially attitudes of students. Although AI offers adaptive and personalized learning, its potential cannot be fully maximized when students are not actively involved in using these technologies. The issue, thus, is the discrepancy between the technological progress of AI education and the learning outcomes, a discrepancy that is usually fashioned by students' perception, reaction, and interaction with AI systems. Knowledge of this human-AI dynamic, specifically from the perspective of student co-creation and attitudinal stance, is essential in making a full educational potential of AI.

1.2. Rationale of the Study

With the development of the educational role of AI, increasing attention must be paid to investigating not merely how AI works but also how students engage with it. A good portion of the current literature focuses on teachers or system design, but students, as the key users, are underinvestigated in their role as co-creators of their own learning. There is a need for a more profound understanding of how students' attitudes influence their interaction with AI tools in order to design learning spaces that are effective, inclusive, and ethically responsible. The research presented here provides information on how agency, curiosity, and ethical awareness attitudes shape or inhibit learning, thereby generating recommendations for pedagogical approaches as well as AI development.

1.3. Purpose of the Study

The main aim of this research is to explore the role of students' attitudes in conditioning the efficacy of AI-powered learning, specifically within the context of student co-creation. Examining how students experience, engage with, and shape AI technology, this research seeks to discern how affective and ethical considerations facilitate or limit learning outcomes in AI-facilitated settings.

1.4. Objectives of the Study

1. To discover and investigate the attitudes with which students approach AI-aided learning tools.
2. To investigate how student attitudes shape student participation in using AI as co-creators of learning.
3. To review how curiosity, agency, collaboration, and ethical consideration influence learning in AI-augmented settings.
4. To offer suggestions for instructors and instructional designers on how to develop more effective AI-paired learning experiences.

1.5. Research Question

What are the prevailing attitudes students have towards AI in education?

1. How do such attitudes affect their disposition to become co-creators in AI-facilitated learning?
2. How do curiosity, agency, and moral awareness affect the efficacy of AI in learning environments?
3. What is the contribution of peer interaction in instilling student engagement with AI technology?
4. How can classroom learning environments be designed to reinforce favorable student dispositions towards AI?

1.6. Limitations of the Study

Sample Size & Generalizability: The qualitative nature and comparatively small sample (30 students at three institutions) restrict generalizability of results to wider populations.

Context-Specific Results: Results are context-specific to specific institutions and technology and may not necessarily reflect experiences in other contexts of education.

Self-Reporting Bias: Interviews and focus groups are based on self-reported data, which can be prone to personal or social desirability bias.

Rapid Technological Change: The quickly changing character of AI technologies implies that tools examined in the study could change, constraining the temporal applicability of the results.

1.7. Definition of Terms

AI-enhanced education: Learning contexts enriched with artificial intelligence technologies like adaptive platforms, intelligent tutoring systems, or recommendation engines.

Co-creation: Pedagogical strategy where students are actively engaged in designing, forming, and assessing their learning experiences.

Student agency: The ability of learners to act autonomously, make decisions, and shape their educational pathways.

Critical AI literacy: The capacity of learners to comprehend, interrogate, and critically analyze how AI works and its ethical consequences in learning environments.

Ethical awareness: Awareness and attention to the moral and social consequences of employing AI technologies within learning contexts.

2. Literature Review

The speed of development of artificial intelligence (AI) technologies in education has generated significant academic interest in their capacity to revolutionize learning and teaching. At the heart of this debate is the changing position of students from being passive receivers to active co-creators in AI-infused learning environments.

2.1. AI in Education: Opportunities and Challenges

AI technologies have the possibility to provide personalized learning through customized content and pacing suited to individual student requirements (Luckin et al., 2016). Intelligent tutoring systems (ITS) can offer timely feedback, scaffold challenging tasks, and identify student misconceptions, thus achieving deeper learning (VanLehn, 2011). Success, however, relies heavily on students' motivation and engagement, which are shaped by their attitudes towards AI (Teo, 2011). Adverse attitudes, e.g., distrust or surveillance fear, may impede effective usage and restrict learning achievements (Zawacki-Richter et al., 2019).

2.2. Students as Co-Creators of Learning

This move towards student-centered pedagogy has placed a focus on conceptualizing learners as co-producers of knowledge. Bovill (2020) has referred to co-creation as a shared process in which students and teachers come together to co-create learning experiences, which can result in higher levels of motivation and more meaningful engagement. Under AI-augmented environments, this co-creation is also applied in the way that students engage with, customize, and evaluate AI tools (Cook-Sather et al., 2014). For instance, students who proactively test adaptive learning systems typically come up with innovative strategies for maximizing their learning outside of mapped routes (Holstein et al., 2019).

2.3. The Student Attitude in AI Augmented Learning

The attitudes of students towards AI are complex, including notions of usefulness, ease of use, trust, and ethics (Teo, 2011; Zawacki-Richter et al., 2019). Research has indicated that positive mindsets are associated with higher willingness to use AI tools, leading to enhanced academic performance (Wang et al., 2020). Meanwhile, fear or apprehension of AI involvement in decision-making can lower participation and motivation (Kizilcec et al., 2020). Furthermore, critical consciousness of data privacy and algorithmic discrimination can shape their trust and uptake in AI, placing emphasis on building ethical AI literacy (Williamson & Piattoeva, 2019).

2.4. Peer Interaction and Ethical Awareness in AI Learning Environments

AI environments that support peer interaction can reinforce collaborative learning, a central feature of co-creation. Peer discussions about AI feedback and learning paths enable students to share insights and develop collective strategies (Zhu et al., 2022). However, such collaboration is most effective when students hold constructive attitudes towards both their peers and the AI tools. Moreover, ethical awareness among students—such as understanding AI’s limitations and the implications of data use—promotes responsible engagement and empowers students to influence AI’s role in education (Selwyn, 2019).

The literature all points in the direction that the effectiveness of AI for learning is strongly linked to student attitudes. Reflective, positive, and ethically aware attitudes

enable students to become co-creators, not just consumers of AI-enriched learning. Educators and designers need to create environments where student agency, critical thinking, and collaboration can flourish to achieve the potential for transformation with AI.

3. Research Methodology

This research employed a qualitative study design to examine the manner in which student attitudes contribute to the efficacy of AI-powered learning, particularly in environments where students are regarded as co-creators. A qualitative method was employed to include students' lived experiences and subjective understanding (Creswell & Poth, 2018).

3.1. Participants and Setting

The research was conducted across three educational institutions (a high school, a university, and a training center) using AI-enhanced learning tools. A total of 30 students, aged 15 to 28, were selected through purposive sampling to ensure diversity in academic background and AI usage experience.

3.2. Data Collection

Data were collected through:

20 semi-structured interviews (45–60 minutes each)

2 focus group discussions (5 students per group)

4 weeks of classroom observations involving AI tools

These approaches facilitated triangulation and more nuanced understanding of students' behavior and attitudes.

4. Data Analysis

All data were analyzed through thematic analysis (Braun & Clarke, 2006). Field notes and transcripts were coded via NVivo 12, and main themes were developed inductively (from the data) as well as deductively (informed by ideas such as co-creation, agency, and ethics).

4.1. Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board. Informed consent and participant anonymity were maintained using pseudonyms and secure data storage.

4.2. Trustworthiness

Credibility was established using triangulation and member checking. Thick descriptions facilitated transferability, while documentation provided dependability and confirmability.

5. Findings & Discussion

The qualitative data from interviews, focus groups, and observations depict that student attitudes are a key determinant of AI-enhanced education's success. A predominant

theme was the sense of ownership and agency students experienced when interacting with AI tools. Many students expressed that adaptive learning platforms allowed them to control the pace and direction of their learning, fostering a feeling of empowerment. One participant noted, “It’s like I’m designing my own path, not just following what the teacher gives me.” This sense of control appeared to enhance motivation and engagement, confirming Bovill’s (2020) assertion that co-creation in learning cultivates deeper investment in the educational process. However, students who perceived AI tools as restrictive or intrusive often exhibited resistance, underscoring the need for systems that encourage agency rather than enforce compliance.

The other key attitudinal component was curiosity and experimentation. Those students who came to AI-facilitated learning with experimentation and exploration of features and innovative approaches showed better results. Language learning app observations, for instance, showed that experimental students employed voice recognition and feedback loops imaginatively, establishing more effective performance and growing confidence in the long term. On the other hand, shy and apprehensive students restricted their interaction with AI technology, which hindered their learning process. These results corroborate Teo's (2011) study showing the role of positive attitudes on technology adoption and learning effectiveness.

Interconnectedness was a third significant theme. Most students saw AI not merely as an isolated tool but within a societal context of social learning. They gave advice and methods to peers on how to "hack" AI systems, which increased their understanding and success in groups. This peer-to-peer collaboration not only boosted the efficiency of AI tools but also supported a community of practice where students were engaged participants in co-creating knowledge (Zhu et al., 2022). Importantly, the willingness to collaborate was linked to constructive attitudes toward both the AI technology and fellow learners, suggesting that social dimensions of learning remain vital even in AI-mediated environments.

Ethical awareness and critical thinking also played a substantial role in shaping student engagement. Students expressed concerns about data privacy, algorithmic fairness, and the transparency of AI decision-making processes. This ethical consideration informed their trust and confidence in fully engaging with AI technologies, underscoring that co-creation among students goes beyond technical interaction to incorporating critical assessment of the role of AI in learning. These findings align with Selwyn's (2019) focus on developing AI literacy with ethical awareness, enabling students to become digital citizens in their own right, rather than mere consumers.

Taken as a whole, these conclusions highlight that the potential of AI-enhanced learning relies on more than the sophistication of technology; it is fundamentally dependent on developing student dispositions conducive to agency, curiosity,

collaboration, and ethical consideration. Teachers and AI developers must thus focus on designing learning cultures and technologies that foster these dispositions. By doing so, they can shift AI from an instructional tool to a stimulus for more profound, richer student-centered learning experiences.

6. Implications for Instructional Designers and Educators

The success of AI in instruction will rest largely on the extent to which systems are designed to welcome student co-creation—not simply in terms of functionality, but in cultivating the appropriate attitudes. Instructional designers and educators need to:

Invite reflective discussion of the application and limitations of AI.

Emphasize student agency through provision of customization, feedback, and open-eedlearning paths.

Develop communities of practice for sharing, critiquing, and enhancing AI experiences among students.

Build critical AI literacy, preparing students to not only ask "how" but also "why" and "who decides."

7. Conclusion

AI-enabled education is full of potential, yet its success is heavily reliant on the values of learners. If students are involved as co-creators—curious, collaborative, empowered, and ethically conscious—then AI can be a transformational tool and not a transactional tool. In order to unlock the full potential of AI in learning, we need to place the learner at the center not only as a user, but also as an active, thoughtful shaper of his or her own learning experience.

8. Recommendations

8.1. To Educators

- Incorporate reflective debate regarding the role and limitations of AI in the classroom.
- Instruct students to personalize and tailor AI learning software.
- Facilitate collaborative tasks in which students exchange AI usage techniques.

For Instructional Designers:

- Develop transparent, customizable, and student-controlling AI systems.
- Integrate feedback mechanisms enabling learners to dispute or query AI decision-making.
- Integrate ethical literacy modules to foster awareness of AI's social and cultural impacts.

8.2. For Policy Makers and Institutions

- Promote teacher professional development for co-creation and ethical AI adoption.

- Set standards for ethical AI integration, including protection of student data.
- Foster interdisciplinary work that investigates the intersection of education, technology, and human agency.

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