The Subjectivity Dilemma and Path of Restoration in Education in the Age of Artificial Intelligence: Reflections Based on Marx's Theory of Alienation

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Abstract: Artificial intelligence is penetrating the field of education with unprecedented depth and breadth, demonstrating significant potential in enhancing teaching efficiency and achieving personalized learning. However, it has also raised profound concerns about the possible erosion of human subjectivity. This paper, using Marx's theory of alienation as an analytical framework, systematically examines the multiple risks of AI applications in education that lead to the alienation of students' and teachers' subjectivity. It reveals the latent "alienation of outcomes," "alienation of processes," "alienation of species essence," and "alienation of relationships" in the educational domain under the expansion of technological rationality. The research points out that technology itself is not the root cause of alienation; the key lies in whether its application logic truly serves the all-round development of human beings. Looking to the future, education should promote the deep integration of AI and humanistic spirit in education by advocating "value-embedded" technology design, promoting "subject-empowering" quality cultivation, and strengthening "value-leading" ethical governance, thereby safeguarding and elevating human subjectivity in the technological era.

Keywords: Artificial Intelligence; Education; Theory of Alienation

1. Introduction

Currently, human society is entering a "singularity" moment where artificial intelligence deeply collaborates with various fields of society. Education, as the core practice that shapes what it means to be human, is also undergoing a profound transformation driven by technology. Applications such as adaptive learning systems, intelligent assessment tools, and data-driven governance models, while enhancing educational efficiency and expanding educational forms, also raise a fundamental philosophical and sociological question: As the educational process becomes increasingly driven by algorithms and characterized by data, do students and teachers, as the main subjects of education, face the risk of their autonomy, creativity, and intrinsic value being obscured or even replaced? In response to this, neither pure technological optimism nor humanistic nostalgia can cope with the situation. There is an urgent need for a theoretical perspective that combines historical penetration and realistic explanatory power.

"Alienation," as a philosophical concept, originally stems from Latin and denotes the transfer and assignment of rights. In the field of sociology, it carries the connotation of separation and estrangement from others. Marx proposed the theory of labor alienation, stating, "The machine has become the form of capital, the power by which capital governs labor, and the means by which capital suppresses all the demands of labor for independence." He believed that in capitalist society, laborers are deprived of the fruits of their labor by capitalists, causing them to become estranged from their own labor and from others, thus giving rise to alienation. Marx's theory of alienation, especially the fourfold prescription of "alienated labor" systematically expounded in "Economic and Philosophical Manuscripts of 1844," provides a sharp ideological weapon for analyzing the predicament of this era. Marx profoundly revealed that in capitalist production relations, the products of laborers, the labor process itself, the human essence, and even social relations between people can all be transformed into alienated and dominant forces. Although artificial intelligence (AI) and machines of the industrial era differ greatly in technological form, the inherent logic behind them, which involves the digitization,

standardization, and computability of human activities, bears a deep resemblance to the mechanism criticized by Marx's theory of alienation, where "living labor" is objectified and dominated. Therefore, revisiting Marx's theory of alienation is not simply a historical analogy, but a systematic diagnosis of the subjectivity crisis triggered by the integration of intelligent technology into the education system, which carries significant contemporary relevance.

2.The Paradox of Subjectivity in Intelligent Education Practice and Its Alienation Risks

When the field of artificial intelligence was established in 1956, people merely regarded "simulating, extending, and expanding human intelligence" as its basic definition and long-term goal, but after 60-plus years of development, artificial intelligence can no longer be merely seen as the simulation, extension, and expansion of human intelligence. It is more of an alienation of human brain intelligence, and can mutually progress and grow with the human brain in the unified yet opposing relationship of alienation. The application of artificial intelligence in education presents a series of "paradoxes" that contain inherent tension, and their common target precisely is the crisis faced by human subjectivity.

Firstly, the paradox of autonomy in personalized learning. Artificial intelligence, through continuous data analysis, customizes learning paths for each student, ostensibly realizing the ideal of "teaching students according to their aptitude". However, this granted "autonomy" may evolve into limited choices within the preset boundaries of the algorithm. Learning is no longer a generative process full of uncertainty, requiring active exploration and trial and error, but rather tends to be a passive response and execution of content recommended by the system. Over time, students' higher-order metacognitive abilities to plan learning paths and make reflective adjustments may gradually atrophy, creating an illusion of autonomy under the "algorithmic control".

Secondly, there is the paradox of de-skilling in enhancing teacher effectiveness. Artificial intelligence undertakes repetitive tasks such as grading and management, aiming to liberate teachers from tedious work and allow them to focus more on the essence of educating students. However, as core aspects of teacher professional autonomy, such as curriculum design, learning diagnosis, and teaching evaluation, are gradually taken over by the system, there is a trend towards the narrowing of the teacher's role to that of an AI scheme executor and process supervisor. Their overall professional judgment based on rich experience and situational awareness, as well as their educational wisdom in adapting to changing situations, are at risk of being marginalized, which may ultimately lead to the loss of professional autonomy and the de-skilling of core competencies.

Thirdly, the integrity paradox inherent in precise assessment. Artificial intelligence can provide instant, fine-grained quantitative learning feedback, but its evaluation system often relies heavily on structured data indicators such as correct answer rates and interaction frequency. Dimensions of student competencies that are difficult to quantify, such as emotional attitudes, values, critical thinking, and collaborative spirit, are easily overlooked in this system. Educational evaluation may thus become distorted into a singular pursuit of "digital performance", resulting in the fragmentation of the "holistic person" into isolated "data points", with instrumental rationality overriding value rationality.

The aforementioned paradox indicates that while AI empowers educational forms, it may also subtly reshape its inherent logic, leading individuals into a state of alienation from their own creations. This resonates with the core concern of Marx's theory of alienation: how man's own creations can, in turn, become alien forces that dominate and alienate him.

3. The Mechanism of Subjective Alienation in Intelligent Education from the Perspective of the Alienation Theory

Based on the fourfold prescription of Marx's alienated labor, a theoretical framework can be constructed to specifically analyze the risk of subjectivity alienation in artificial intelligence education.

Firstly, the alienation of learning outcomes. For students, knowledge is preset and pushed by artificial intelligence systems as standardized and conveniently consumable "information packages". Learning activities may then degenerate into the reception, reproduction, and coping with external content, rather than the generation and construction of meaning through

personal participation, confusion, and insight. Quantitative evaluation results such as scores are alienated from their original intention as a means of measurement, and become the ultimate goal of learning activities, thereby dominating students' self-worth cognition and emotional experience. For teachers, their educational achievements are simplified into measurable and comparable performance reports or data indicators. The labor value of teachers is alienated from their educational ideals of promoting students' comprehensive development, and they are forced to shift towards "score-raising" oriented competitions under performance pressure.

Secondly, there is the alienation in the learning and teaching process. Marx proposed in "Economic and Philosophical Manuscripts of 1844" that the human-like characteristic is free and conscious activity. This kind of free and conscious labor enables humans to use their intelligence to create tools, transforming both nature and themselves, thus distinguishing them from other organisms. Human subjectivity is an important symbol of their uniqueness, which is embodied through their subjective initiative. While teachers and students enjoy the convenience and efficiency brought by generative artificial intelligence, they may also become increasingly dependent on it to complete tasks that originally required human intelligence participation. This will lead to an unprecedented alienation between humans and nature and society, and rational thinking, as the unique advantage of the human brain, will no longer be as prominent as it once was, thus affecting the free and comprehensive development of humans. Students' learning activities may be transformed into "piecework" through "gamification" mechanisms, where they earn points, badges, and rankings, and their inherent thirst for knowledge and exploration are replaced by external stimuli. Highly structured human-computer interaction also detaches the rich emotional flow and nonverbal communication in real classroom teaching, making the learning experience tend towards loneliness and abstraction, alienating it into a digital "cognitive drudgery". For teachers, if teaching activities completely follow the standardized processes preset by artificial intelligence systems, their creative teaching design based on specific situations and the artistic space for improvisation will be severely squeezed. Teaching activities will be downgraded from a creative process full of wisdom and art to a step-by-step technical operation, and professional autonomy will be substantially eroded.

Thirdly, the alienation of human's species-specific nature. The fundamental purpose of education lies in cultivating and developing human's "free and conscious" species-specific characteristics - namely, critical thinking, aesthetic creation, pursuit of meaning, and other abilities. However, the convenience provided by artificial intelligence (especially generative artificial intelligence) in offering ready-made answers or templates may gradually deprive students of the necessity and willingness to independently ask questions, conduct in-depth exploration, and express creatively, leading to the "outsourcing" of cognitive abilities and the atrophy of thinking "muscles". At the same time, algorithms, as value-neutral tools, are difficult to carry the complex functions of value transmission and spiritual shaping, tending to lead to the "value hollowing" of the educational process. For teachers, if their role is narrowly defined as a "tool" for improving quantifiable exam scores, their species-specific activities as value leaders and spiritual inspirers are systematically devalued, and profound educational ideals are at risk of being gradually eroded in a data-driven performance management system.

Fourthly, the alienation of social relationships between individuals. Education is essentially a communal practice based on genuine and deep interactions between teachers and students, as well as among students themselves. The deep involvement of artificial intelligence may lead to the "disintermediation" of teachers, transforming teacher-student relationships into functional connections primarily centered around data tasks, rather than "I-Thou" encounters full of emotional interaction and personal influence. Overemphasizing individual paths in "personalized learning" may exacerbate the "atomization" of students in terms of physical and temporal arrangements, replacing peer relationships based on shared experiences, sincere debate, and selfless collaboration with virtual interactions or highly programmed group activities, weakening authentic emotional bonds and social construction.

4. The Rejection of Alienation: Constructing

an Intelligent Education Ecosystem Centered on People

The ultimate goal of the critique of alienation lies in exploring the path to liberation. In the face of the challenges brought by artificial intelligence, we should not adopt an attitude of excluding technology. Instead, we must conduct conscious theoretical reflection and practical intervention to guide it to serve the re-establishment and elevation of human subjectivity. This requires collaborative efforts at multiple levels such as technology design, educational practice, and ethical governance.

At the technical design level, it is essential to deeply embed humanistic values. Developers should embrace a "human-centered" design philosophy, ensuring that AI systems are positioned to enhance rather than replace human decision-making, and guaranteeing that teachers and students always retain the ultimate right to judge and choose. Vigorously promote "explainable AI" technology, break the "black box" of algorithms, and enable the system to clearly explain its analytical logic and recommendation basis to teachers and students, thereby supporting users in conducting critical examination and questioning. Actively advocate for the "value-sensitive design" methodology, incorporating core humanistic values such as autonomy, creativity, and sociality as key design parameters from the initial stages of research and development, rather than solely pursuing pure technical indicators such as efficiency and accuracy.

At the level of educational practice, efforts should be made to empower students. The "critical AI literacy" system should be incorporated into the educational curriculum at all levels to cultivate students' and teachers' abilities to rationally evaluate, effectively utilize, and responsibly participate in shaping technology. It is important to reiterate the irreplaceable role of teachers in value guidance, emotional care, personality shaping, and complex situational judgment, and to promote the transformation of teachers' professional development towards "making good use of AI to deepen educational practice". We must firmly defend educational spaces that are difficult to be simply quantified, such as art, sports, social practice, and philosophical discussions, and implement a comprehensive evaluation system that integrates process, performance, and multiple subjects to provide institutional guarantees for human's comprehensive development and creative emergence.

At the level of ethical governance, it is necessary to establish clear value guidance. The relationship between "is" and "should", "morality" and "utility", "freedom" and "responsibility" in artificial intelligence technology is the theoretical basis for giving full play to the value norms and guiding role of ethics. Initiate extensive public discussions and academic debates on the "fundamental purpose of education in the intelligent era" within society, and be vigilant against the tendency for education to be completely instrumentalized for human resource production. Establish and improve a multi-dimensional ethical review mechanism and a normalized regulatory framework for artificial intelligence education products, focusing on assessing their potential risks in terms of data bias, privacy protection, fairness assurance, and impact on students' autonomy. Ultimately, we should return to the "relational" essence of education, making technology a bridge that enhances and deepens, rather than replaces, real interpersonal dialogue, ideological collision, and life interaction.

The deep integration of artificial intelligence and education has become an irreversible trend of the times. What we are facing is not a binary choice of whether to adopt technology, but how to shape a future vision that truly serves human well-being and liberation. Marx's theory of alienation, with its profound critical power, warns us to avoid losing human subjective value in the tide of technological application. Looking ahead, only through continuous theoretical self-awareness, prudent practical exploration, and sound institutional design can AI be transformed from a potential alienating force into a powerful driving force for the free and comprehensive development of everyone. On this path, a clear examination of technological rationality and a steadfast adherence to the original intention of education's humanity will be the inevitable prerequisite and fundamental guarantee for education in the intelligent era to move towards "human liberation".

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