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Ethical Challenges of Artificial Intelligence in Education: Achieving Learner Centricity with Respect to Learner Autonomy

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Abstract: In the realm of education, the integration of Artificial Intelligence (AI) has emerged as a transformative force, offering the potential to reshape conventional learning paradigms through the provision of personalized and adaptive educational experiences that cater to the unique requirements of each learner. While the promise of AI in education is undeniably compelling, its implementation is accompanied by a nuanced tapestry of ethical challenges, notably in the context of learner autonomy and agency. The connection between learner autonomy, ethical considerations, and AI in education is carefully examined in this research. A thorough literature analysis reveals what is learner autonomy and its potential effects on it. It examines different ethical issues such as algorithmic biases and decreased active involvement that arise from balancing AI's educational augmentation with preserving learner autonomy. In order to strengthen student autonomy in AI-integrated learning settings, the study suggests best practices to address challenges faced for achieving learner autonomy.

Keywords: AIED, Leaner centricity, learner autonomy, learner agency, challenges, practices

1. Introduction

A rapidly growing topic called artificial intelligence in education (AIED) promises to provide each student with individualized learning opportunities that cater to their unique needs and learning preferences. The use of AIED as a technology engine for educational innovation can also be used to support the development and reform of instructional strategies and delivery systems. Additionally, AIED can be utilized as a technical instrument to unlock the "learning black box," allowing for the precise quantification and clear expression of social, psychological, and academic knowledge. However, the use of AIED has also raised more ethical questions and hazards about a number of issues, including learner autonomy and personal data (Nguyen et al., 2023). Additionally, AIED raises ethical issues such as the possibility that AI may be used to violate students' privacy, discriminate against members of marginalized groups, and foster a culture of surveillance in the classroom. Therefore, it is crucial to create moral standards for using AIED that guarantee that this technology is utilized in a way that is beneficial to all.

The integration of Artificial Intelligence in Education (AIED) introduces a complex ethical landscape concerning the pursuit of learner-centricity in relation to autonomy. Learner autonomy, a cornerstone of effective education, allows individuals the agency to shape their learning paths according to their preferences. However, the extensive capabilities of AIED systems, while aiming to optimize learning experiences, can inadvertently compromise learner autonomy if they become excessively prescriptive or make decisions on behalf of learners without their involvement. Such instances could curtail learners' freedom of choice, inhibiting their ability to explore diverse topics or adopt alternative learning strategies. Scholarly

discussions have highlighted concerns over the potential erosion of learner autonomy and agency arising from the integration of AI into education (Shum, S. J. B., & Luckin, R. (2019). . Moreover, the convergence of privacy and autonomy issues emerges with the concept of affective capture, wherein behavioral nudges informed by AI-driven insights could potentially infringe upon learners' privacy and autonomy (Nemorin, 2017). To comprehensively address these challenges, this study embarks on a systematic literature review to unravel the intricate dimensions of learner autonomy and agency in the context of AIED and learner-centricity.
In pursuit of a holistic understanding, this research seeks to answer pivotal research questions:

RQ1. Definition of "learner autonomy and agency": Delving into the conceptual underpinnings of learner autonomy and agency, this question aims to provide a clear and nuanced comprehension of these crucial aspects.

RQ2. Challenges in Achieving Learner-Centricity with Respect to Learner Autonomy and Agency: This question investigates the hurdles and complexities that emerge in the quest for learner-centricity, particularly concerning the preservation of learner autonomy and agency.

RQ3. Best Practices from the Literature to Address Challenges: By surveying existing literature, this question seeks to identify and elucidate best practices that have been proposed as effective strategies to mitigate the ethical challenges linked to learner autonomy and agency within the AIED framework.

Through this systematic exploration, we aim to illuminate the multifaceted terrain of learner autonomy and agency within AIED, providing insights into the challenges that arise and proposing potential solutions to foster a balanced integration of AI that upholds learner-centricity while respecting their autonomy and agency

2. Methodology

2.1 Systematic literature review

The literature review commenced by selecting appropriate keywords and constructing a focused search string. To comprehensively assess the impact of AIED across various dimensions including transparency, fairness, privacy, and the integration of autonomy within this context, a targeted exploration was undertaken. The initial search string employed was "(Artificial Intelligence OR AI) AND (Education) AND (Ethics) AND (Transparency OR Accountability OR Privacy OR Fairness OR Explainability OR Autonomy)," which guided the retrieval of relevant literature. This inclusive combination of keywords facilitated a comprehensive search across 8 distinct databases, including ERIC, JSTOR, Taylor & Francis, Scopus, Science Direct, IEEE, and ACM. The scope of analysis was refined to encompass peer-reviewed articles published in the English language from the years 2013 to 2023. Subsequently, articles were subject to stringent screening, as illustrated in the PRISMA analysis in Figure 1. The figure depicts the application of diverse inclusion criteria and the resultant count of articles that met the requisites for thorough scrutiny and detailed analysis.

On the basis of the finalized publications on autonomy that were analyzed, we have provided answers to our study questions. The findings about autonomy are discussed in the section after this.

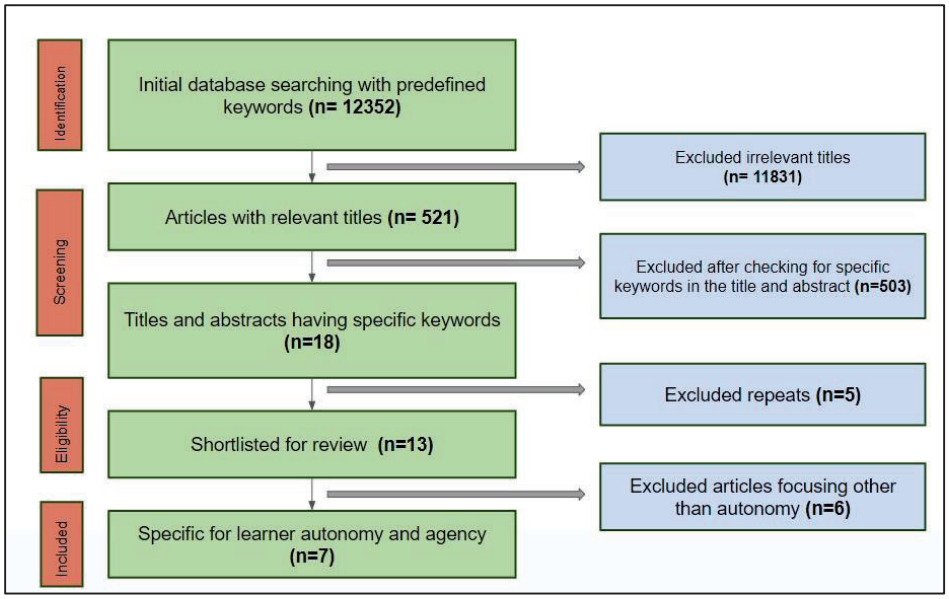

Figure. 1: Systematic Literature Review PRISMA Diagram

3. Findings

3.1 Concept of Autonomy and Agency

Ethical frameworks often link agency with autonomy, which means the ability to live by one's own rules. Agency refers to a person's ability to take action and make choices based on their personal goals and values. It determines the range of options and achievements they can pursue in a meaningful way (Ilkka Tuomi , 2023). In the ethical frameworks, it is considered that agency subsumes autonomy and it is connected to freedom, free will, and oppression. Positive freedom is the capacity to act on one's free will, while negative freedom is freedom from external control. Autonomy allows individuals to choose from these imagined alternatives based on their own evaluations and values. Autonomous actions reflect personal value choices, and the individual can be held morally responsible for their decisions. (Ilkka Tuomi , 2023). According to Right to Autonomy, learners should be provided the choices mentioned in figure 2 (Holmes, W., Persson, J., Chounta, I. A., Wasson, B., & Dimitrova, V. (2022).

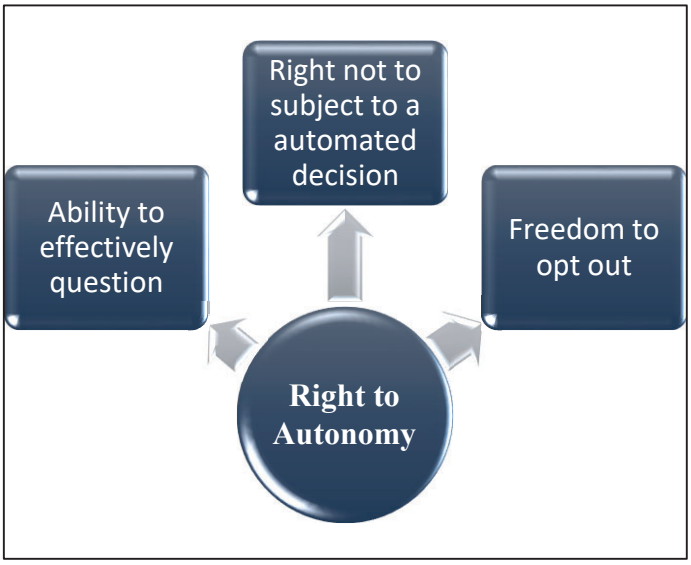

Figure 2: Choices to be given to leaner

1. Individuals have a right not to be subject to a decision that is made solely through automated processing if these decisions have legal consequences or significantly impact individuals.
2. The ability to effectively question and challenge judgments informed and/or made by an AI system, as well as to request that such decisions be reviewed by a human.
3. The freedom to opt out of AI-enabled manipulation, personalized profiling, and projections.

Currently, AI assistants have become versatile in their functions, aiming to offer guidance and support to users. They fulfil various roles, from providing information and answering queries to managing tasks and offering recommendations. However, their presence and influence can impact how individuals perceive and process information. When AI assistants provide advice or recommendations, they act as external or extrinsic influences on a person's decision-making process. This can alter the way individuals perceive certain information, leading to changes in their cognitive biases. Cognitive biases are mental shortcuts or patterns that can influence how people interpret and make judgments about information and manipulate one's intrinsic motivation by encouraging and providing support (Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. P. T. (2023).

AI systems, including personalized learning, intelligent tutoring, chatbots, emotional support, automated grading, learning analytics, language learning, and proctoring, are widely used in education. However, when these systems restrict learners' choices and excessively regulate and monitor their actions without their involvement or permission, it undermines learners' autonomy and agency (Akgun & Greenhow, 2021; Adams et al., 2023). AI systems often rely on vast amounts of data to make predictions, limiting learners' options to prevent perceived faults (Nguyen et al., 2023). Online proctoring during exams can also impede learners' natural behaviors, such as muttering to themselves or taking breaks (Coghlan et al., 2021).Learner autonomy is essential for empowering individuals and giving them control over their destinies. Neglecting learner autonomy poses challenges, emphasizing the importance of respecting learner choices. The following section discusses these challenges and the reasons why AI in education should uphold learner autonomy

3.2 Ethical Challenges and the Importance of Learner Autonomy in AIED

Learner autonomy is a very crucial thing while a child is learning and when it is ignored learner gets affected deeply and it impacts their future learnings. According to Piaget, at the age of seven or eight, a child's moral thinking shifts from heteronomy to autonomy. Heteronomy is when a child uses authoritative rules for his/her moral judgments. Whereas autonomy is when a child takes moral judgments on their own will. Piaget stressed that autonomy grows through social cooperation. In child psychology, the development of identity, self-image, self-efficacy, and growth mindset is closely connected to the advancement of autonomy. Consequently, there are assertions that children are social actors who require comparable freedoms and rights as other members of society (Ilkka Tuomi, 2023). Worries about autonomy arise when leaners' freedom to act according to their own values and interests is restricted or reduced. For instance, predictive algorithms that predict future actions based on people's metadata can intensify existing biases and prejudices in society. This raises significant concerns about social inequalities (Akgun, S., & Greenhow, C., 2022).

One of the key ways this impact is seen is through the vast amount of data that AIED systems use. These systems gather data from various sources, including learner interactions, performance metrics, and historical patterns. However, this data might carry inherent biases, reflecting the societal and cultural contexts from which it was collected. When AIED systems rely heavily on biased data, they can inadvertently perpetuate and amplify existing inequalities and stereotypes. Additionally, the prescriptive nature of AIED systems can impact learners' sense of autonomy. When students receive automated recommendations and instructions, they might feel compelled to follow them without fully understanding the rationale behind those

choices. This could diminish their ownership and agency over their learning journey and weaken their critical thinking skills.

The challenges relating to learners' autonomy are highlighted by the recently expanded use of AI in education. A few number of scholars have discussed these difficulties and provided a few practices that deal with learner autonomy in a leaner-centric approach.

3.2 Best practices for ensuring learner autonomy and agency

The previous sections discussed what is learner autonomy, and what are the challenges. This section, Table 1 lists many strategies for overcoming and challenges related to sustaining to learner autonomy.

Table 1: *Practices to address challenges related to learner autonomy*

Practices	**What it addresses**
Obtaining learner assent	Respects learners' capacity for choice and autonomy
Clearly communicating that learners have the freedom to opt out of sharing their data	Respect learners' privacy and autonomy
Leveraging AI systems to enhance learners' Agency	Fosters autonomy across cognitive, social, and cultural dimensions
Prioritizing accuracy in AI development and deployment	Avoids false information dissemination and safeguards users' capacity for autonomous cognition, emotional well-being, and social development
Avoiding the use of words or algorithms promoting computational propaganda in AIED systems	Protects learners from manipulation
Providing comprehensive training programs for educators	Equips educators with the requisite skills to implement AIED effectively and reduce potential manipulation of learners' thought processes

In K-12 educational settings, where legal consent might not be applicable to children, a proactive approach to empower learners is through obtaining their assent. It is imperative to clearly communicate, using age-appropriate language, that learners have the freedom to opt out of sharing their data, thereby respecting their capacity for choice (Adams et al., 2023), (Nguyen et al., 2023). Leveraging AI systems to enhance learners' agency fosters autonomy across cognitive, social, and cultural dimensions, enabling them to realize their full potential (Adams et al., 2023).

However, while interacting with AI systems, challenges arise, potentially limiting learner autonomy. For example, the provision of hints and suggestions by the system can impact decision-making. To mitigate this, it is essential that AI development and deployment prioritize accuracy, avoiding false information dissemination, and safeguarding users' capacity for autonomous cognition, emotional well-being, and social development (Nguyen et al., 2023). Ethical considerations extend to the linguistic and algorithmic elements employed; the use of words or algorithms promoting computational propaganda should be avoided within AIED systems (European Parliament, 2021).

In facilitating this transition, comprehensive training programs for educators are crucial. Equipping educators with the requisite skills to implement AIED effectively enables them to tailor, filter, or minimize the automation of AI systems, thereby reducing potential manipulation of learners' thought processes and promoting their identity development. This multifaceted approach, encompassing informed assent, learner agency, ethical system design, and educator training, serves as a foundation for the ethical and responsible integration of AI in educational contexts

4. Discussion and Conclusion

Personalized learning through artificial intelligence in education (AIED) has the potential to transform education by tailoring content to individual students. However, ethical concerns arise, particularly concerning learner autonomy and agency. Learner autonomy refers to a student's ability to choose what they learn, while learner agency involves taking control of their learning. AIED systems that are overly prescriptive can unintentionally limit learner autonomy and agency. Addressing these ethical issues requires a comprehensive strategy to preserve and respect learner autonomy and agency. Key steps include providing transparency and choice to learners. This means giving students clear information about how AIED systems work and allowing them to opt out of certain features, empowering them to actively participate in their learning journey. Furthermore, ensuring fairness and impartiality within AIED systems is crucial. Rigorous data collection and analysis methods, along with careful curation of features and algorithms, are essential to prevent discrimination and ensure equal access to quality education for all learners. Protecting learner privacy is another cornerstone of this ethical framework. Balancing the collection and use of data with the principles of necessity and proportionality is vital. Learners should also have the ability to access and control their own data. Empowering learners with knowledge is equally important. Educating them about the potential benefits and risks of AIED helps them make informed decisions and exercise informed agency. Additionally, stakeholders like educators, educational designers, institutions, policymakers, and developers can benefit from these insights. Educators can use this information to navigate ethical challenges and use AIED in ways that respect learner autonomy and agency. Policymakers can develop responsible AIED policies, and developers can create ethical and beneficial AIED systems.

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