

ETHICAL ASPECTS OF THE USE OF AI IN EDUCATION: ISSUES OF CONFIDENTIALITY, FAIRNESS AND TRANSPARENCY

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ABSTRACT

The article examines the complex ethical issues that arise when using artificial intelligence in the educational field. The focus is on three key aspects: the confidentiality of student data, the fairness of AI algorithms, and the transparency of their work. The authors analyze how the thoughtless use of AI can lead to a violation of personal privacy, an increase in existing biases and a lack of understanding of these processes among participants in the educational process. The article offers specific recommendations on the development of data protection standards, conducting audits of algorithms for bias, as well as methods of training and stakeholder engagement to ensure the ethical application of AI. It also examines the potential risks that may arise due to the lack of transparency of algorithms and the possible reproduction of biases, which could lead to a deepening of existing social inequalities. The article calls for the development of strict ethical standards and policies aimed at protecting the interests of all students and ensuring equal opportunity in access to educational resources. The authors highlight the importance of an interdisciplinary approach to exploring the ethical aspects of AI in education and offer specific recommendations for educational institutions, AI developers, and legislators and regulators to work together to address the identified issues. This study highlights the importance of creating effective mechanisms for the control and management of technological innovations in education to prevent moral and social risks.

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1. INTRODUCTION

In the last decade, the use of artificial intelligence (AI) in educational contexts has expanded significantly. From the personalization of curricula to the automation of assessments and administrative tasks, and offers promising opportunities to improve educational processes (Chen et al., 2020; Ayeni et al., 2024). However, these innovations also raise serious ethical questions, especially regarding confidentiality, fairness

and transparency. Let's take a closer look at each of these aspects (Leenes et al., 2014; Stahl et al., 2017).

The aim of the study is to analyze the ethical issues associated with the use of artificial intelligence in educational processes, especially with regard to confidentiality, fairness and transparency of data and algorithms (Akgun & Greenhow, 2022):

-To assess the impact of AI on the educational process, exploring how technologies can not only improve educational practices, but also unknowingly reproduce or reinforce existing social biases and inequalities.

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-Develop recommendations for the management and control of the use of AI, suggesting mechanisms and strategies for creating safer, fairer and more transparent educational technologies.

-To promote the development of ethnic standards and policies that can be integrated into educational institutions to manage technological innovations in respect of the rights and needs of all students.

2. DATA PRIVACY

Data privacy is one of the main problems when using AI in education. Educational institutions collect huge amounts of data about their students, including personal information, test scores, behavioral patterns, and more (Luan et al., 2020). This data is used to power AI algorithms, which in turn help in the adaptation of educational materials and techniques (Chen et al., 2020). However, there is a risk of misuse of this data, which may lead to a violation of the confidentiality of students. It is important to ensure that data is protected and used only with the consent of students or their legal representatives, and that all processes are transparent and understandable to all stakeholders. Data privacy is becoming a key issue when integrating artificial intelligence into educational processes. With increasing dependence on technology, educational institutions collect and process huge amounts of students' personal data, which raises concerns about their security and privacy:

a) Data definition

Data collected at educational institutions may include personal information (name, age, address), academic information (grades, educational progress), behavioral data (interaction with educational platforms, activity timestamps) and even biometric data (for example, data for biometric identification systems) (Russell & Norvig, 2016).

b) Privacy risks

Unauthorized access: Data may become available to third parties without the consent of the data subjects, which violates their right to privacy. Misuse of data: There is a risk that the data may be used for purposes unrelated to the educational process, for example, for commercial offers or profiling.

c) Data leaks: Errors in security systems can lead to data leaks, which is especially dangerous in the case of sensitive information.

Privacy measures

Compliance with the law: Ensuring compliance with applicable data protection laws, such as GDPR in the European Union or FERPA in the United States, which regulate the collection, use and dissemination of personal data.

Privacy Policies and Consent to Data processing: Clear privacy policies should be developed and easily accessible to students and their parents. Consent to the processing of personal data must be explicit and informed. Data minimization and encryption: Reducing the amount of data collected to the minimum necessary

and using strong encryption methods to protect data in storage and during transmission (HLEG, A. High-Level Expert Group on Artificial Intelligence, 2019).

Regular audits and privacy impact assessments: Conducting regular audits and privacy impact assessments can help identify vulnerabilities and risks at an early stage. As AI becomes more integrated into educational processes, it is important that educational institutions take data privacy protection seriously. Effective risk management related to confidentiality will not only protect the rights of students, but also strengthen confidence in the use of new technologies in the educational environment.

3. THE FAIRNESS OF ALGORITHMS

Fairness in the use of AI also raises serious concerns. Algorithms can unknowingly reproduce existing biases and discrimination by embedding them in educational processes. For example, if an algorithm is trained on data that disproportionately represents one group of learners compared to others, the results of its work may be biased. This can have a negative impact on minority students or those with non-standard educational needs. The solution to this problem lies in the development of algorithms that actively take into account and compensate for these biases, as well as in constant monitoring of their work. The fairness of algorithms in the use of AI in education. The fairness of algorithms is one of the central ethical issues in integrating artificial intelligence into educational systems. Equity in the context of AI means that systems should provide equal opportunities for all users and should not exacerbate existing social and economic inequalities. This is especially important in education, since discriminatory algorithms can negatively affect the educational and life prospects of students (Latonero, 2018).

4. THE PROBLEMS OF JUSTICE IN AI

-Bias-generating data: If the training data contains biases, then algorithms trained on this data will reproduce and amplify these biases. For example, if historical data reflects stereotypes or social inequalities, AI can make decisions that infringe on the rights of certain groups.

-Opacity of algorithmic processes: The complexity and closeness of AI algorithms can make it difficult to understand and evaluate their fairness, which makes it difficult to eliminate bias and discrimination.

-Lack of universal standards: The lack of generally accepted standards for assessing the fairness of AI makes it difficult to develop and apply common criteria and methodologies.

Solutions to improve equity

Data audit and correction: Conducting data audits for bias and adjusting data sets to ensure representation of all population groups.

Developing interpretable models: Creating more transparent and interpretable AI models can help understand and control how algorithms make decisions and ensure their fairness (Hagendorff, 2020).

Community involvement: The inclusion of a wide range of stakeholders, including representatives of marginalized groups, in the process of developing and implementing AI to ensure diversity of views and needs.

Continuous learning and adaptation: Development of systems capable of continuous learning and adaptation based on feedback, which will allow timely elimination of emerging equity issues.

To ensure fairness in the use of AI in education, an integrated approach is needed, including technical, legal and social measures. Only then will technology be able to contribute to the creation of a more just and equitable educational space. This is especially relevant when AI algorithms are used to make decisions that affect academic results, access to resources, and future opportunities for students:

a) Determining the fairness of algorithms

Fairness in the context of AI algorithms implies that algorithms should work in an unbiased manner, ensure equal opportunities for all students and not exacerbate existing social inequalities. This requires algorithms to be able to ensure equality in data processing and decision-making regardless of race, gender, social origin or any other distinguishing factors (Mamadalieva & Raiymbayev, 2024).

b) Risks of violation of justice

Bias in the data: If the training data used to develop AI algorithms contains bias, it may cause the algorithms to reproduce or amplify this bias. For example, if data on high academic achievement disproportionately reflects the success of a certain group of students, algorithms may develop preferences that negatively affect other groups.

Transparency of algorithms: The lack of transparency in the operation of algorithms can make it difficult to understand and evaluate their fairness. If students and teachers do not understand how decisions are made, this can undermine trust and be considered unfair.

Measures to ensure fairness

-Development of neutral algorithms: It is necessary to implement development methods that contribute to the creation of neutral and non-biased algorithms. This may include the use of data processing techniques that minimize bias.

-Regular testing and audits: Regular testing of algorithms for bias and conducting independent audits can help to detect and eliminate deficiencies in fairness.

-Education and community engagement: Raising awareness among students and teachers about how algorithms work and what consequences they can have will help build trust and promote the development of more equitable systems.

Ensuring the fairness of algorithms in education is a difficult but critically important task. This requires constant attention to data quality, AI training methods, and process transparency. Successfully overcoming these challenges will maximize the potential of AI in

education, making it a tool to promote equality and improve the educational experience for all students.

5. TRANSPARENCY OF PROCESSES

Transparency in the use of AI in education is critical to maintaining trust and openness. Students and teachers should understand how and why algorithms make certain conclusions or recommendations. Without understanding the mechanisms of AI, there is a risk of its misuse or rejection by the educational community. It is important to develop and implement mechanisms that will explain decision-making processes by AI algorithms, making them accessible and understandable to all participants in the educational process.

Transparency of the processes related to the use of artificial intelligence in the educational environment is a key aspect to ensure the trust and effectiveness of these technologies. A lack of understanding of how AI makes decisions or processes data can lead to a decrease in trust and resistance from students and teachers:

-The importance of transparency

Transparency in the use of AI means that all stakeholders, including students, teachers and administration, should have a clear understanding of what data is collected, how it is processed, and how the AI makes certain conclusions or recommendations based on this data. This helps all participants in the educational process feel more confident and secure, realizing that technology works for the benefit of their educational experience (Mamadalieva & Raiymbayev, 2024).

-Problems with transparency

Algorithm complexity: Many AI algorithms, especially those based on deep learning, can be highly opaque and difficult to understand. This creates problems when users cannot understand why a particular decision was made.

Intellectual property protection: Companies and developers may be unwilling to disclose details of their algorithms, citing intellectual property protection, which also reduces transparency.

Lack of knowledge: Insufficient knowledge and understanding of AI technologies among educational staff and students may hinder the effective perception and use of these technologies.

-Ways to improve transparency

Educational programs: The introduction of educational programs that explain how AI works and is used in an educational environment can help improve understanding and acceptability of its application.

Standards and regulations: The development and implementation of standards and regulations that require AI developers to disclose information about the operation of algorithms can improve transparency.

Visualization Tools and Interfaces: Create user interfaces and visualization tools that can help users better understand how AI analyzes data and makes decisions (Jobin et al., 2019).

Transparency in the use of AI in education not only contributes to a better understanding and trust in

technology, but is also an important prerequisite for the ethical application of these powerful tools. Educational institutions should strive to create an environment in which each participant feels informed and confident that technologies are used responsibly and transparently (Mamadalieva & Raiymbayev, 2024).

6. SOLUTIONS AND RECOMMENDATIONS

To address the above ethical issues, educational institutions and AI developers (Schwartz & Solove, 2011) should consider the following steps:

- Development of data protection standards: Educational institutions should develop and implement strict standards for data security and confidentiality, ensuring that the collection and use of student data is carried out transparently and with consent (O'Neil, 2016).
- Checking and auditing algorithms: Regular checks and audits of algorithms for bias and discrimination will help identify and correct potential problems of fairness in the work of AI.
- Training and stakeholder engagement: It is important to educate both teachers and students on the basics of AI so that they can better understand and control how technology is used in their educational environment.
- Creation of ethics committees: The formation of ethics committees, including teachers, students, parents and AI experts, will help develop ethical guidelines and policies regarding the use of AI in education.

7. CONCLUSION

Artificial intelligence in education opens up new opportunities for personalizing the educational process, improving administrative efficiency and supporting teachers and students. However, the introduction of AI also involves serious ethical challenges that need to be carefully considered and addressed. Issues of confidentiality, fairness and transparency in the use of AI remain in the focus of attention of scientists, developers, educational workers and politicians.

Effective and ethical use of AI in education requires the development of clear policies governing data collection and processing, strict control of algorithms to prevent and correct bias, as well as ensuring transparency of all processes for all participants in the educational process. Only if these conditions are met can the potential of AI be maximized as a tool for enriching educational experience and supporting diverse and inclusive educational environments.

Educational institutions should work with AI developers, legislators, and the public to create and maintain an environment where technology is used responsibly and for the benefit of all students. Such cooperation will not only avoid potential risks, but also contribute to the formation of a more equitable and effective educational system in the future. The use of AI in education opens up new horizons for improving the quality and accessibility of education. However, in order to fully realize its potential, it is necessary to take seriously the solution of ethical problems. Confidentiality, fairness and transparency should be key principles in the implementation of AI in educational processes. This approach will not only increase the effectiveness of training, but also help to avoid many social and moral problems associated with technological innovations.

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