TEAM REPORT FOR THE EVENT

ETHICAL USE OF AI

December, 2024

Date of the Report created/modified: 24.12.2024

Team 1 : AI in Teaching and Learning

Mentor of the group: Prof. Bobi Badarevski, Faculty of Philosophy
Students' coordinator: Aleksandar Ristoski

Introduction

In today's world, where technology advances daily, questions related to this progress are becoming increasingly frequent. As the pace of advancement accelerates, we face growing difficulties in addressing the social and ethical challenges that come with this progress at the same rate. This document will specifically address the issue of using artificial intelligence (AI) in the education system, including recommendations that should be followed, ways it can be used for education and student support, as well as the problems that need to be monitored and addressed during its use.

As with any new technology introduced into our daily lives, the challenge of acceptance and training the staff who would benefit from it is the first obstacle. We cannot discuss integrating artificial intelligence into education without first addressing how to educate teachers and professors on this topic and the possibilities it offers. This includes understanding the capabilities and limitations of AI, as well as potential ethical dilemmas.

The uncertainty surrounding technology and reluctance to use it often stems from a lack of understanding. Therefore, the first step must be education. Instead of perceiving artificial intelligence as a mythical and intimidating concept encountered in apocalyptic movies, we should present an accurate picture of how it works, the opportunities it provides, its limitations, and the potential issues that may arise during its use. In the following text, we will delve deeper into examples of these points and the ethical use of artificial intelligence in teaching and learning.

Transparency in Use

When teachers decide to use AI in their teaching, it is crucial to be transparent about its application. If it is used for grading, for instance, since AI, like any other model, does not have 100% accuracy, results should not be fully trusted. From an educational perspective, we

will explore some recommendations on how AI can help and in what ways it can be used in the teaching process.

Training and educating the Professors

Education and training: Provide training for teachers and students on how to use AI tools ethically. This includes understanding the capabilities and limitations of AI, as well as potential ethical dilemmas.

Adapting to the Individual Needs of Students

A teacher, being just one person, may always struggle to cater to the diverse ways students learn, understand, and progress. Using AI, specialized programs tailored to the different types of students and their unique needs can be created quickly.

1.Gamification and Interactive Learning

The concept of transforming educational material into engaging, interactive forms that spark interest and involvement among students is not new. However, using AI can simplify this process and motivate teachers to adopt this approach more frequently, which would greatly benefit students.

2.Technologies for Inclusivity

Inclusivity is also not a new topic, but AI offers revolutionary ideas in this field. Some examples include:

Eye-tracking systems: Designed for students who cannot use traditional educational materials.

Speech-to-text conversion: Provides easier access to materials for all students, including those who may be unable to physically type or hear.

Speech-to-text tools: Facilitate easier access to educational materials for all students, including those who may have physical disabilities that prevent typing or hearing impairments that hinder listening.

Ethical Use of Data

The use and misuse of data is a frequent topic of discussion in this field. In today's virtual world, a person's data is their greatest asset and the most sought-after by various organizations and companies. With all the examples we have provided for using AI, our data is essential for its functionality.

Efficient Creation of Educational Plans

With the rapid pace of development in the world, information quickly changes and becomes outdated. AI can help teachers stay up-to-date with the latest information in their field and the materials they teach. This ensures that students always have the most relevant and current knowledge.

Objective Assessment - Inclusivity and Fairness

Data Accuracy and Consistency - Much of the assessment that is done is subjective, the way one professor assesses may be different from others, this leads to differences in the data and the model would not have an accurate, objective way of assessing

Data Bias BEWARE - If the model is trained on data that contains inequalities (e.g., differences in assessment based on gender, ethnicity, or socioeconomic status), those biases can be carried over into the assessment.

*Note - This should be a tool that would help professors grade, not do the grading for them. It should take only some part or give them better insight so they could grade better.

Continuous Improvement

AI's ability to constantly collect and analyze data can help identify weaknesses and gaps among students. This allows teachers to pinpoint areas where students may need additional help and time. It also helps identify the most effective methods for knowledge transfer and the approaches that are most perceptive to students.

Fast access:

One of the biggest advantages of AI in education is the ability to quickly access information. Students can get answers in seconds, without having to wait for a teacher or mentor, making learning faster and more efficient. This allows them to:

Self-directed learning

Students can explore and learn at their own pace, without being limited by the availability of teaching staff. This is especially useful for students who want to study outside of school hours or during holidays.

Resolving urgent questions

In situations where a quick understanding of a topic or concept is needed, such as before an exam or project deadline, students can immediately receive clarification through virtual tutors or chatbots.

Access to additional resources

In addition to simple answers, AI tools can offer links, recommendations for books, articles, videos, or other resources that students can use to understand the topic more deeply.

Reducing Barriers

For students who are shy or don't feel comfortable asking questions in front of the entire class, AI tools offer anonymity and a sense of privacy, which encourages them to seek help when they need it.

Personalization

Virtual tutors can adapt to the needs of each student, providing explanations according to their level of understanding and interests. Virtual tutors can assist children with simple and intuitive explanations, not only for technical topics like programming but also for concepts related to logic and critical thinking.

Challenges in Using AI in Education

As already mentioned several times, alongside the benefits, there are also challenges when it comes to using AI in education. Although the benefits may seem appealing, the ethical dilemmas that arise and the numerous limitations in the AI field cannot be overlooked.

Lagging behind human interaction: - What not to do!

Emotional and cultural dimension: Literature is often more than just text – it is a journey through culture, history, emotions, and individual experiences. AI cannot establish an identical relationship with the reader as living authors do.

Perception of meaning and creativity: The creative processes in literature often require intuition and creative decisions that are based on human experience, which is something that AI cannot truly replicate.

Loss of personalized interaction: AI can create texts, but they often do not have the same depth, individuality or uniqueness that the author’s personal style brings. This can result in a decrease in the personal touch in books, which is characteristic of traditional literature.

Free Usage

The government should fully fund the use of AI as this would be a public service (a very needed one!).

Team 2 : Ethical Use of AI in Academic Research

Mentor of the group: prof. d-r Katerina Zdravkova (FINKI)
Students' coordinator: Savche Gjosheva and Adela Asani

A. Automation in Research: Moral Limits of AI in Research Tasks

Incorporating the European Commission's "Living Guidelines on the Responsible Use of Generative AI in Research" into university practices can enhance the ethical integration of AI in research. These guidelines emphasize principles such as reliability, honesty, respect, and accountability.

1. Automation in Research: Problems and Solutions

Problem: Over-reliance on AI for Literature Reviews and Data Analysis

• Researchers may excessively depend on AI tools, compromising the quality of interpretation, own creativity and critical thinking.

Solution: Human Oversight and Collaboration

• Establish collaborative workflows where AI tools assist in tasks like literature reviews and data analysis while humans maintain responsibility for interpreting results.

• Introduce mandatory training programs for researchers on integrating AI efficiently without undermining creativity or critical thinking.

Problem: Bias in AI-Generated Outputs

• AI systems may perpetuate biases present in training data, leading to unfair or skewed results.

Solution: Bias Prevention in AI Systems

• Conduct regular audits of AI systems to detect and mitigate biases.

• Diversify training datasets to ensure inclusivity and fairness in AI-generated outputs.

Problem: Risks to Research Integrity

• Automation might introduce confirmation bias or distort results if not managed correctly.

Solution: Promoting Research Integrity

• Implement systems to identify and address risks of confirmation bias or result distortion.

• Create guidelines that define appropriate levels of AI involvement, ensuring AI serves as a supportive tool rather than replacing human intellect.

By aligning university practices with these guidelines, institutions can promote responsible AI usage in research, ensuring that automation enhances rather than undermines research integrity.

B. Main Issues in Data Privacy in Academic Research

Problem 1: Lack of Clear and Informed Consent

Description: Participants often find consent forms lengthy, complex, or unclear, making it difficult to understand their rights or how their data will be used.

Solution:

Simplify consent forms using clear, accessible language.

Incorporate multimedia aids like videos or infographics to explain complex concepts.

Use dynamic consent frameworks that allow participants to modify or withdraw their consent over time without penalties.

Problem 2: Excessive Data Collection

Description: Researchers sometimes collect more data than necessary, increasing privacy risks and potential misuse of sensitive information.

Solution:

Apply the principle of data minimization by collecting only the data essential to the study.

Use automated tools to flag unnecessary data during the collection process.

Regularly review data collection practices to ensure alignment with research objectives.

Problem 3: Unregulated Third-Party Data Sharing

Description: Data is often shared with third parties without proper participant consent or adequate oversight, leading to potential misuse.

Solution:

Obtain explicit consent for third-party data sharing, outlining who will have access and

for what purpose.
Draft standardized agreements with collaborators to emphasize confidentiality and permissible use.
Regularly audit third-party compliance with data security and ethical guidelines.

Problem 4: Indefinite Data Retention
Description: Retaining data long after a project ends increases the risk of misuse or breaches.
Solution:
Implement clear data retention policies, keeping data only as long as necessary for research or regulatory purposes.
Securely destroy or anonymize data once it is no longer needed.
Schedule periodic reviews to ensure compliance with data retention guidelines.

Problem 5: Legal and Regulatory Non-Compliance
Description: Researchers may struggle to navigate complex data protection laws such as GDPR or HIPAA, risking legal penalties and reputational damage.
Solution:
Provide mandatory training for researchers on data protection laws and ethical practices.
Appoint a Data Protection Officer (DPO) to oversee compliance and approvals.
Use automated compliance tools to document and manage regulatory adherence.

Problem 6: Ambiguities in Data Ownership
Description: Collaborative research projects often face disputes over data ownership and future usage rights.
Solution:
Establish clear agreements on data ownership, usage, and sharing rights at the outset of each project.
Ensure agreements respect participant rights and balance collaborative interests.
Regularly revisit agreements to address new research requirements.

Problem 7: Privacy Risks in AI and Machine Learning
Description: AI systems may inadvertently expose sensitive information or reinforce biases in decision-making.
Solution:
Use anonymized or synthetic data to train AI models, reducing risks of re-identification.
Conduct regular bias audits and ensure datasets are inclusive and representative.

Develop explainable AI models to provide transparent and interpretable decision-making processes.

Problem 8: Vulnerability to Data Breaches

Description: AI systems relying on centralized data storage are prone to breaches, potentially exposing vast amounts of sensitive information.

Solution:

Use advanced encryption techniques to secure data during transmission and storage.

Adopt privacy-enhancing technologies like federated learning and secure multi-party computation.

Conduct regular security audits to identify and mitigate vulnerabilities.

Problem 9: Loss of Data Utility Due to Anonymization

Description: Anonymization techniques can sometimes degrade the quality and utility of data for research purposes.

Solution:

Employ hybrid anonymization methods, balancing privacy protection with data utility.

Use advanced techniques like differential privacy and noise addition to maintain analytical value.

Leverage synthetic data that retains statistical characteristics without revealing personal information.

Problem 10: Challenges in Managing Dynamic Datasets

Description: Real-time or evolving datasets complicate consistent application of privacy protections.

Solution:

Implement adaptive anonymization techniques for real-time data processing.

Use data versioning to manage changes while maintaining privacy safeguards.

Continuously evaluate privacy risks with evolving datasets through regular audits.

C. AI Transparency and Reproducibility: Problems and Solutions

Problem: Lack of Transparency in AI Algorithms

• Researchers may struggle to understand how AI models reach their conclusions, undermining trust.

Solution: Algorithmic Transparency

• Require researchers to document and disclose the methodologies used in AI models, including training datasets and algorithmic adjustments.
• Encourage the use of interpretable AI tools to ensure that decision-making processes can be understood and validated.
Problem: Challenges in Reproducibility
• AI-generated results may vary, making independent verification difficult.
Solution: Promoting Reproducibility
• Establish protocols to test the reproducibility of AI-generated results before publication.
• Provide access to source codes, data, and methodologies to facilitate independent replication by other researchers.
Problem: Accountability for AI Errors
• Unclear responsibility for errors or biases in AI-driven research outputs.
Solution: Accountability Measures
• Create a central repository where researchers must log their use of AI tools, specifying their contributions and limitations.
• Assign clear accountability for errors or biases in AI-driven research outputs.

D. Ethical Authorship Issues: Problems and Solutions

Problem: Undefined Roles of AI in Authorship
• It is unclear how to credit AI tools in research publications.
Solution: Defining Roles of AI and Humans
• Establish policies for acknowledging AI contributions in research papers, such as listing AI tools in the methodology or acknowledgment sections.
• Define human researchers as primary authors, emphasizing their role in guiding and interpreting AI outputs.
Problem: Plagiarism Risk from AI-Generated Content
• AI tools might generate content that inadvertently plagiarizes existing work.
Solution: Plagiarism Prevention
• Deploy AI-powered plagiarism detection tools to review AI-generated content for originality.
• Mandate that researchers disclose the extent of AI involvement in generating research outputs.
Problem: Ambiguities in Intellectual Property Rights
• Confusion over ownership of AI-generated research outputs.

Solution: Intellectual Property Rights

• Develop agreements clarifying intellectual property ownership in research projects involving AI.

• Encourage institutions to establish policies governing the rights of researchers and participants regarding AI-generated content.

E: Research Misuse of AI: Problems and Solutions

Problem: Fabrication of Data Using AI

• AI tools can be misused to generate false data or research findings.

Solution: Preventing Fabrication and Misrepresentation

• Implement automated systems to flag anomalies or inconsistencies in datasets and research findings.

• Require researchers to submit detailed logs of AI model operations and generated outputs.

Problem: Lack of Oversight in AI-Driven Projects

• Insufficient review mechanisms to ensure ethical use of AI in research.

Solution: Regular Ethical Audits

• Conduct periodic audits of AI-driven research projects to ensure compliance with ethical guidelines.

• Introduce peer review mechanisms focused on evaluating AI's role in research outputs.

Problem: Limited Awareness of AI Ethics

• Researchers may lack knowledge about the ethical implications of AI usage.

Solution: Education and Awareness

• Incorporate ethical AI training into academic curricula, emphasizing responsible usage and potential risks.

• Host workshops and seminars on emerging ethical challenges and best practices for AI in research.

F: Legal and Regulatory Standards: Problems and Solutions

Problem: Complexity of GDPR Compliance

• Navigating legal requirements like GDPR can be overwhelming for researchers.

Solution: Simplifying GDPR Compliance

• Develop easy-to-follow guides and tools to help researchers navigate complex legal requirements, including GDPR.

• Appoint Data Protection Officers (DPOs) to oversee compliance efforts within the institution.

Problem: Insufficient Consent for AI Applications

• Participants may not fully understand how AI will be used in the research process.

Solution: Ensuring Informed Consent for AI Applications

• Specify how AI tools will be used in the research process and ensure participants are informed of potential risks.

• Provide participants with options to opt out of studies involving AI-generated analysis or content.

Problem: Risks in Cross-Border Data Transfers

• International collaborations may inadvertently violate data protection laws.

Solution: Cross-Border Data Transfer Protocols

• Use GDPR-compliant cloud services and secure data-sharing practices for international research collaborations.

• Conduct impact assessments for data transfers to identify and mitigate privacy risks.

By implementing these solutions, universities can foster a responsible and ethical approach to AI in research, addressing privacy, transparency, accountability, and collaboration while safeguarding academic integrity.

Team 3 : AI in University Administration

Mentor of the group: Jovana Doberva, MSc., from FINKI

Students' coordinator: Angela Vasilevska

Introduction

During the workshop, students and workshop coordinators discussed the ethical use of artificial intelligence in University Administration. Students, with the help of the coordinators, identified the main problems, challenges and the lack of artificial intelligence for university administration in their own country, and then tried to find potential and feasible solutions to the same problems. We started from the main problem of the lack of digitization itself, and then the insertion of artificial intelligence into it. Through creative discussions, students came up with potential solutions, which they later presented to other

groups, in order to get overall views on future improvements as well as smart and ethical use of artificial intelligence.

Key discussion points that were included:

- The digitization of documents and efficient management.
- Encryption of data for secure transmission over public networks.
- Automation of processes such as exam registrations, scholarship recommendations, and optimization of student schedules.

Key Challenges in University Administration

Document Digitization

One of the biggest challenges is the insufficient digitization of documents and reliance on physical submission and archiving. Students presented the lack of digital documents as a huge problem they face. Despite the existence of the Iknow platform, which is not equally effective for all faculties, the digitization of documents is still not enough. Waiting in huge queues, when enrolling in a faculty, starting a semester, receiving a grade in the index or returning documents takes too long. The only, quick and efficient solution to all these problems is the introduction of digitization and electronic documents that will significantly reduce waiting times. The main question was, how would the documents be digitized? There were several ideas, such as quickly importing the documents themselves via text editor, or scanning the same documents in PDF format and uploading them. We also mentioned that in order some documents to be relevant, they must have a relevant PDF.

A proposal was made to create a server, for example Discord, with a database.

The database would be a large unit that would contain data such as ID card number, name, faculties, and all other documents (certificates, high school diploma). It was also suggested by the students that the LLM platform could be used.

On the other hand, when digitizing documents, students concluded that they could face other problems. First, they considered the problem of verification and authentication of submitted documents. A potential solution was the introduction of electronic signatures and seals. With the help of OCR (Optical Character Recognition), the students decided that the goal of

completely digitizing documents as well as recognizing whether they are relevant would be achieved.

Authentication and Security

In addition to the problem of digitizing documents, the discussion turned to the issue of document protection. If documents are uploaded to the Internet, they can be exposed to various Internet attacks, which will lead to data disclosure. All this, the participants believe, is a much bigger problem than the digitization of documents itself, because the personal data of students, if not properly protected, can be used for bad purposes. After a short discussion, the students decided that according to existing Internet protocols for protecting and encrypting data passing through the Internet, this problem is solvable. Encryption of data and documents when uploading them to the Internet is possible using ADS and local servers, such as the local server of FINKI (Faculty of Computer Science and Engineering). There was also discussion about secure access to documents already uploaded on Internet platforms. The solutions that were proposed were the use of a one-time password (OTP) or simply introducing two-step verification on the university platforms on which the documents will be uploaded.

Proposals for Innovative Solutions

Automation of Student Processes

To automate student processes, it was proposed that digital platforms using artificial intelligence would help students choose faculties, courses, and scholarships depending on their grades in various subjects. This would be a very optimal way to schedule, as well as consult students on where it is best to apply and where they would achieve the best success.

Also, when considering the method of registering for exams, the optimal solution would be to introduce direct registration for exams through the Iknow system, which would eliminate unnecessary surveys and additional registration for the exams themselves.

The workshop participants discussed that when enrolling in a faculty, semester, or in case of other ambiguities regarding the university administrative part, in addition to the student service, it would be good to introduce an AI chatbot that would explain to students what documents they need for various applications, as well as other general questions that are unclear to students. We conclude that a chatbot would be a very optimal solution for getting information faster, at any time and in any place.

Exam Schedule Optimization

Using tools like Google Calendar would greatly optimize student success and exam scheduling. Since traditional scheduling neglects exam durations, exam overlaps, poor scheduling of exams by the level of difficulty of the different subjects being taken, as well as the exact number of students taking the exam, it is proposed to introduce a dynamic system based on analysis and automation, which can be displayed via platforms like Google Calendar or similar tools. This way, students will have the opportunity to more accurately organize their study time, achieving better results.

Improvement of Administrative Platforms

The workshop participants discussed that despite the existing administrative platforms, their improvement is necessary. Existing platforms should offer more accurate and clear visualization of data and documents. They suggested to improve the CAS platform so that students can automatically log in to any administrative platform and to different systems. All in order to improve the accuracy of evidencing student attendance as well as secure storage of student data. The suggestion was to introduce the use of the Eduroam network, which would provide greater security as well as scanning codes to check student attendance at lectures.

Document Verification and Tracking

At the workshop, students discussed possible changes to the verification and processing of student applications, especially for student scholarship applications. It was suggested that we should introduce a chatbot that would automatically transfer the required documents from one administrative platform to another, or that documents could be downloaded from one platform to be uploaded to the platform where applications should be submitted.

A field could also be introduced that would contain data on when and by whom the application was reviewed.

Potential solutions and implementation

Below is a table that outlines the challenges students face due to the lack of digital platforms, as well as the lack of artificial intelligence on existing platforms. The table also includes the solutions that students proposed at the workshop as potential and most optimal solutions to the existing problems they face.

Challenge	Solution
Insufficient digitization of documents	introduction of an OCR system and digital signature for verification.
Transferring data and documents over public networks	Encryption and authentication via OTP (one time password) and two step verification.
Inefficient exam schedule	Dynamic scheduling algorithm and integration with a digital calendar.
Scholarship and course recommendation using sites that use artificial intelligence	Algorithms that analyze grades and recommend necessary resources.
Long procedures for submitting and obtaining documents	Chatbot for automating application and document verification.

Conclusion

The application of synthetic intelligence (AI) in university administration has the ability to significantly enhance performance and decrease bureaucratic hurdles. By digitizing documents, implementing optimization algorithms, and integrating strong safety solutions, both college students and administrative staff can advantage from quicker and greater seamless get admission to to critical information and services.

Proposed answers inclusive of virtual signatures, data encryption, and the automation of administrative strategies through AI are pivotal in modernizing the university device. Digital signatures can make certain the authenticity and integrity of critical files, eliminating the want for bodily verification and decreasing the opportunity of fraud. Meanwhile, information encryption provides a layer of safety important for protecting touchy statistics transmitted over public networks, thereby safeguarding student facts and administrative records from potential cyber threats.

Furthermore, automating tactics like direction registration, exam scheduling, and scholarship tips can streamline operations, lessen human mistakes, and shop time for each college students and team of workers. For instance, algorithms that examine pupil grades to advocate scholarships tailor-made to their educational strengths no longer most effective simplify choice-making but also create possibilities for college students to access funding more efficiently. Similarly, an AI-pushed scheduling machine can optimize exam timetables through taking into consideration factors which includes direction difficulty, examination periods, and student choices, in the long run improving educational effects.

By embracing these AI-driven innovations, universities can create a greater responsive, secure, and green administrative ecosystem that better serves the needs of all stakeholders at the same time as placing a benchmark for modern academic establishments.