



WP3: Participatory Action Research on Needs and Prioritisation Map



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Chapter 3 Current regulation on AI in Higher Education

3.1 UNESCO

3.1.1 Universal Declaration of Ethics for Artificial Intelligence

Artificial intelligence (AI) has the potential to revolutionize many industries, but it has the most impact on education. It is now essential for universities to incorporate AI into their educational operations to improve student results, customize training, and expedite administrative procedures as they adopt new technologies (UNESCO, 2020).

AI integration in higher education involves many applications, from improving teaching and learning outcomes to handling administrative duties. AI-powered solutions can automate repetitive administrative activities like scheduling, grading, and admissions, giving teachers more time to concentrate on important work. Additionally, AI-driven analytics help universities make sense of massive amounts of data, which makes resource allocation and decision-making easier (UNESCO, 2020).

Artificial Intelligence (AI) presents new techniques for individualized education in the teaching and learning area. Smart tutoring programs may adjust to meet the needs of each student, offering customized guidance and feedback. AI-powered systems can also evaluate student performance data to pinpoint areas in need of development and suggest tailored learning programs. Artificial intelligence (AI) powered by virtual reality (VR) and augmented reality (AR) technologies improve experimental learning by enabling students to participate in learning environments (Siemens, G., & Baker, R., 2012).

However, there are drawbacks to the adoption of AI in higher education as well, such as privacy issues, ethical issues, and the requirement for instructors to receive additional training in order to use AI tools efficiently. Overcoming these obstacles is essential to realizing AI's full educational potential.

In a world ruled by the rapid evolution of technology, the major contribution of AI in any field is undoubtedly evident. Equally obvious is the danger of using AI technologies without ethical barriers. Without a code of ethics, fundamental human rights can be significantly affected. In these contexts, the interest and major concerns of many states are obvious in developing a unique standard for ethics in AI. "Recommendation on the Ethics of Artificial Intelligence" was the first standard adopted by UNESCO in November 2021, to which 193 Member States joined. The central objective of this approach is to establish a universal framework of values to guide states in the development of legislation related to artificial intelligence.

The Fundamental Principles for Ethics in Artificial Intelligence (AI) aim to ensure the responsible use of AI for the benefit of humanity. The key recommendations are as follows:





- Respect for fundamental human rights: AI should protect human dignity and promote social inclusion, free from discrimination and bias.
- Transparency: AI systems must be transparent and easily understandable to users.
- Responsibility and accountability: Those involved in the development and deployment of AI are responsible for the impact and decisions made by these technologies and must be accountable for any harm or negative outcomes.
- Privacy and data protection: AI must manage data ethically and in compliance with privacy regulations.
- Equity: AI should ensure that its benefits are accessible to all social groups.
- Security and safety: The development and use of AI must protect against cybersecurity risks and prevent misuse of the technology.

3.1.2 Guidelines for Artificial Intelligence in Education

The use of AI in teaching and learning could be one of the most common uses in higher education. Adaptive learning systems driven by artificial intelligence examine huge amounts of student data in order to customize lessons to each student's unique learning preferences and speed. By offering real-time feedback, individualized study suggestions, and dynamic material delivery adjustments, these systems can increase student engagement and enhance learning results.

Additionally, chatbots and AI-powered virtual tutors function as virtual assistants, providing students with immediate support and helping them do tasks outside of the classroom. These intelligent technologies can supplement conventional teaching techniques and encourage individual learning by responding to inquiries, offering clarifications, and offering help with assignments (Siemens, G., & Baker, R., 2012).

Administrative responsibilities at universities are numerous and include everything from managing enrolment and admissions to planning and marking courses. AI expedites these procedures by automating tedious jobs, giving administrators and teachers back critical time and resources. AI-driven chatbots, for example, can answer questions from potential students, helping them through the admissions process and giving them pertinent details about requirements and programs [20].

Universities can also increase operational efficiency and optimize resource allocation with the use of AI-driven predictive analytics. Universities can estimate trends in student enrolment, anticipate staffing needs, and improve course scheduling to promote academic success and student happiness by examining historical data (Knight, S., et al., 2014).

AI systems can scan through enormous databases of scientific papers, find pertinent research articles, and extract insightful data that helps guide future discoveries and educational activities. In addition, AI-powered modelling and simulation tools make it easier to conduct experiments and test hypotheses in a variety of fields, including economics, social sciences, chemistry, and physics. Using these simulations, scientists can investigate intricate phenomena, replicate actual situations, and accelerate the rate of innovation and discovery.





Although integrating AI into higher education has enormous potential, there are obstacles and ethical questions that need to be answered. It is imperative to provide serious consideration to issues about data privacy, algorithmic bias, and transparency to guarantee the responsible and ethical implementation of AI systems. To effectively use AI tools and navigate the changing world of technology in education, educators and administrators need to upskill (Government of Germany, 2018).

UNESCO has formulated comprehensive guidelines on the use of artificial intelligence (AI) in education. The main recommendations are generally focused on the ethical, fair and efficient integration of AI technologies in education. The formulated principles include the approaches on inclusion and equity. In UNESCO's view, AI should improve access to education, especially for marginalised and disadvantaged groups. Furthermore, AI technologies must support diverse linguistic, cultural and regional needs.: AI in education must respect human rights without violating privacy.

AI applications must protect the personal data of students and teachers, ensuring data transparency in how decisions are made.

AI technologies must be educationally supported in teaching and learning processes, especially personalized learning. Educational content can be tailored to the specific needs and learning styles of students, with AI improving students' engagement and outcomes.

Teachers, especially those from the university environment, are increasingly interested in using AI tools in their teaching activities. AI can be used effectively and ethically in both education and research. Ethics in research requires that any innovation based on artificial intelligence must still be analysed to ensure that the research results are beneficial to society.

3.2 OECD

3.2.1 Guiding Principles for the Development and Use of Artificial Intelligence

Artificial Intelligence is a technology that is rapidly evolving, that has a great impact on different aspects of daily life, including education. Artificial Intelligence presents a lot of opportunities now for teaching and learning, but it also poses potential challenges related to its behaviour in human interaction and child development. Therefore, regulating Artificial Intelligence is mandatory (Council of Europe Standing Conference of Ministers of Education, 2020).

It was proved that Artificial Intelligence can help in different educational settings. Technologies that use AI proved themselves useful when were used to support diverse learners, including children and lifelong learners, as well as those with special needs. The data that was collected from these processes might help offer insights into the learning process, while tools like voice assistants and adaptive tutoring might help improve more inclusive learning (Maria Gkoutouma, European Commission, 2023).

However, it is important to also acknowledge the negative impacts that the use of Artificial Intelligence in education might have. Poor pedagogic practices might be automated, therefore perpetuating existing biases and discriminatory approaches. It could also help spread





disinformation and misinformation. This could also affect human rights, specifically the right to education of every human being (Council of Europe Standing Conference of Ministers of Education, 2020).. Another negative aspect of using Artificial Intelligence is how the data that the models learn are processed and used in further applications. Individualised learning, privacy, and equity in the field of education, are questioned, and users need to develop a better understanding of the impact it is having on their surroundings (Maria Gkoutouma, European Commission, 2023).

The Digital Education Action Plan 2021-2027 presents the European Commission's strategic view on the long-term digital transformation of education and training systems. This plan offers a long-term strategic view for high-quality and inclusive European digital education. It addresses the challenges that appeared during the COVID-19 pandemic, which led to different changes in the educational field. It seeks stronger cooperation at the EU level on digital education and it presents opportunities, including improved quality and quantity of teaching concerning digital technologies. This plan proposes two strategic priorities: to foster a high-performing digital education ecosystem and to enhance digital skills and competencies for the digital age.

The usage of Artificial Intelligence systems can potentially enhance teaching, learning, and assessment, providing better learning outcomes and helping schools to operate more efficiently. However, it should be questioned if the same AI applications are designed properly because otherwise, it could lead to harmful consequences. Teachers and educators need to be aware and question the reliability of the AI systems that they are using, and if the educational data that is provided is managed and secure. In 2021, the European Commission proposed a comprehensive legal framework for AI (AI Act) explaining mandatory requirements for "high-risk" AI systems used in several areas, including the educational field (European Union, 2020).

These guidelines identify four cases in which Artificial Intelligence can be used in classrooms across Europe (European Union, 2020):

- Student teaching – using AI to teach students (student-facing);
- Student supporting – using AI to support student learning (student-facing);
- Teacher supporting – using AI to support the teacher (teacher-facing);
- System supporting – using AI to support diagnostic or system-wide planning.

To develop these guidelines, four key factors were identified and taken into consideration [16]:

- Human agency – this factor relates to an individual's capacity to become a competent member of society. A person with the agency can take life actions and also be fully responsible for those choices. Concepts such as autonomy, self-determination, and responsibility are often associated with agency.
- Fairness – this factor refers to how an individual is treated inside its social organisation. All the processes need to be clear for all the users to receive equal access to opportunity. Equity, inclusion, non-discrimination, and fair distribution of rights and responsibilities are concepts that are associated with fairness.





- Humanity – this factor refers to the identity, integrity, and dignity of the people. Factors that are necessary for human connection, such as well-being, safety, social cohesion, meaningful contact, and respect, need to be taken into consideration. This connection implies that people should be approached with respect for their intrinsic values and not as data objects. This is the basic definition of a human-centric approach to AI.
- Justified Choice – this factor relates to the use of knowledge, facts, and data to justify necessary collective choices by multiple individuals in the educational field. It must be transparent and is based on participatory and collaborative models of decision-making models.

These ethical considerations are valuable in education. They should guide educators, teachers, and school leaders in their decisions regarding the usage of AI software. The AI Act proposes some requirements for every AI system that is deployed and used in education. The requirements are (European Union, 2020):

- Human agency and oversight – this includes fundamental rights, children’s rights, human agency and human oversight;
- Transparency – this includes traceability, explainability, and communication.
- Diversity, non-discrimination, and fairness – this includes accessibility, universal design, the avoidance of unfair bias, and stakeholder participation.
- Societal and environmental well-being – this includes sustainability, environmental friendliness, social impact, society and democracy.
- Privacy and data governance – this includes privacy, quality, and integrity of data, and access to data.

In conclusion, the AI field is constantly growing and becoming more accessible to every user. Its capabilities can make a great tool or resource for educators and students but misusing them can lead to harmful consequences. Every AI software needs to abide by certain principles so that it can be ethical and human-centred. According to the European Commission AI Act, AI software can be used in various modes in schools. Still, it needs to respect certain guidelines, such as human rights, data security, and inclusion, for it to be considered a reliable source of learning.

In 2019, the OECD adopted five principles of artificial intelligence (AI). These principles include recommendations for developing artificial intelligence systems that benefit society. 42 countries have adhered to these principles approved by OECD members.

According to these principles, the main beneficiary of the technologies

AI is society. According to the principles formulated by the OECD, AI must contribute positively to the economic growth of a society and increase social inclusion, while reducing the negative impact on society. In addition, AI technologies must be designed so that they do not harm vulnerable people, and any person can understand the results and benefits of AI.

Applications based on artificial intelligence must be designed to work in good conditions without producing harmful results and to be secure and resistant to external attacks.





3.2.2 Recommendations on Artificial Intelligence in Education

Recommendations for Leveraging AI in Education

- Invest in AI infrastructure and training: To improve instructors' skills in using AI tools, universities should make significant investments in training programs and a strong AI infrastructure. These consist of online courses, workshops, and conferences on the use of AI in education.
- Encourage multidisciplinary collaboration among educators, AI academics, and industry professionals to investigate new AI solutions customized to meet educational needs. Launch research projects to find out how AI affects teaching methods, student engagement, and learning outcomes.
- Encourage ethical AI practices: Create policies and procedures that address issues like algorithmic programs, data privacy, and transparency when using AI in education. To guarantee justice and equity, promote accountability and openness in AI-powered decision-making processes.
- Facilitate learning that is focused on the student: Utilize AI-driven adaptive learning platforms to provide customized training according to the needs and preferences of every student. Support students in taking control of their education by offering independent learning modules and interactive resources.
- Use AI for student support services: Set up chatbots and virtual assistants with AI capabilities to offer students round-the-clock assistance with questions about course registration, academic advising, and campus resources. By using AI-driven interventions universities could identify students with problems early and offer focused support interventions, increasing student engagement and decreasing college dropout (UNESCO, 2020).
- The use of AI in education has the potential to entirely reshape university teaching and learning methods. Universities can improve student learning results, customize courses, and expedite administrative procedures by effectively using AI tools. To fully reap the educational benefits of AI, however, coordinated efforts addressing pedagogical, technical, and ethical issues are needed. Universities may harness the revolutionary power of artificial intelligence (AI) to define the future of education by adopting a collaborative and student-centered approach.

3.3 European Union

3.3.1 General Data Protection Regulation (GDPR) in Artificial Intelligence (AI)

The General Data Protection Regulation (GDPR), implemented by the European Union (EU) in May 2018, has had a profound influence on the management and security of personal data.



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As AI technologies continue to progress and get integrated into a wider range of businesses, the convergence of GDPR and AI has emerged as a critical issue for ensuring data security and privacy. This essay examines how GDPR affects AI systems and highlights the challenges and potential solutions for protecting personal data while utilizing AI for applications. The GDPR, which lays a significant focus on values like accountability, transparency, and individual rights over personal data, establishes a comprehensive framework for data protection.

AI and big data

Artificial Intelligence has developed rapidly during the past ten years. It has a strong scientific foundation and several effective applications. It offers chances for knowledge dissemination, energy sustainability, improved health care, and social, cultural, and economic advancement. Serious concerns including unemployment, inequality, discrimination, social exclusion, monitoring, and manipulation come along with these opportunities.

Data minimization and purpose limitation

Data minimization, which mandates that personal data be collected be appropriate, relevant, and restricted to what is necessary for the indicated purpose, is one of the fundamental tenets of the General Data Protection Regulation (GDPR). Large datasets are, however, usually needed for AI systems to increase their performance and accuracy. This calls for striking a careful balance between following the data reduction principle and gathering enough data to create reliable AI models.

Moreover, GDPR requires that personal data be gathered for stated, defined, and lawful purposes and not be handled in a way that is inconsistent with those goals. Artificial intelligence (AI) systems, particularly machine learning-based ones, frequently entail continuous learning and data reuse, which can be in opposition to the purpose limitation principle. To solve this, organizations need to make sure that data subjects are informed of the precise goals of data processing and that any further uses of the data are consistent with the original aim.

Data Subject Rights and AI

GDPR grants several rights to data subjects, including the right to access, rectify, and erase their data, as well as the right to data portability and to object to automated decision-making. These rights present unique challenges for AI systems, particularly those involving automated decision-making processes.

For instance, the right to explanation, derived from the GDPR's provisions on automated decision-making, requires that individuals are provided with meaningful information about the logic, significance, and consequences of automated decisions. Given the complexity and opacity of many AI algorithms, providing such explanations can be difficult. Organizations must





strive to enhance the transparency of their AI systems, potentially through the development of explainable AI techniques that can offer clearer insights into how decisions are made.

Protecting Data in AI Systems

To ensure compliance with GDPR while leveraging the benefits of AI, organizations must implement robust data protection measures. Several strategies can be employed to safeguard personal data in AI applications.

Data anonymization and pseudonymization

An effective approach to protect personal data in AI systems is through anonymization or pseudonymization. Anonymization involves removing all personally identifiable information (PII) from the dataset, rendering it impossible to identify individuals. Pseudonymization, on the other hand, replaces PII with artificial identifiers or pseudonyms, reducing the risk of data re-identification while allowing some level of data utility.

Both techniques can help organizations mitigate privacy risks and comply with GDPR requirements. However, it is crucial to ensure that anonymization and pseudonymization methods are robust and resistant to re-identification attacks, which can compromise data privacy.

Privacy by design and default

The GDPR places a strong emphasis on the idea of "privacy by design and default," which calls for the early integration of data protection safeguards into the creation and functioning of systems. This means that for AI systems, privacy concerns must be considered at all phases of the AI lifecycle, from gathering and processing data to training and deploying models.

Organizations should adopt practices such as data encryption, access controls, and regular security assessments to protect personal data. Additionally, conducting data protection impact assessments (DPIAs) can help identify and mitigate potential privacy risks associated with AI systems, ensuring compliance with GDPR.

Fairness, accountability, and transparency

For AI systems to comply with GDPR, fairness, accountability, and transparency are essential. To prevent discriminatory outcomes from AI models, organizations need to put processes in place to identify and reduce biases in these models. This entails conducting routine fairness audits of AI systems and implementing remedial measures upon the discovery of biases.

Organizations must keep thorough records of all data processing operations, including the goals, types of data handled, and any data transfers, to be held accountable. To react to data subject requests and demonstrate compliance with GDPR, this documentation is necessary. Transparency is telling data subjects in an understandable and accessible way how their data is being used by AI systems. People must be informed about the different kinds of data that





are gathered, the reasons behind the processing, and their rights as per the GDPR. Improving openness can guarantee informed consent and foster trust with data subjects.

Organizations face possibilities as well as obstacles when integrating AI technologies with GDPR. Even though AI systems have a lot to offer in a lot of different fields, maintaining GDPR compliance is crucial to safeguarding personal information and respecting people's rights. Organizations can use AI responsibly and ethically by putting strong data protection measures in place, such as data anonymization, privacy by design, and encouraging fairness and openness. To maintain privacy and build trust in the digital era, continuous attempts to harmonize AI practices with GDPR will be essential as AI continues to advance.

3.3.2 European Strategy for Artificial Intelligence

The use of artificial intelligence (AI) in education is a growing trend with the potential to transform teaching and learning processes. As the digital revolution continues, AI technologies are increasingly recognised for their ability to improve educational outcomes through personalised learning, efficient administration, and new teaching approaches. Europe, known for its excellent education systems and pioneering technological breakthroughs, is at the forefront of this trend. Drawing on their long history of academic success and technological innovation, European countries are actively developing and implementing comprehensive strategies to integrate AI into their educational institutions. This chapter looks at the main ways in which AI is being incorporated into education systems in Europe. It looks at projects involving both the European Union and individual Member States. AI integration brings significant benefits to the educational sector. These benefits include the ability to provide personalized learning experiences tailored to individual student needs, the automation of routine administrative tasks, the support and augmentation of teaching capabilities, and the increased accessibility of education for students with diverse needs. However, alongside these promising benefits, there are notable limitations and challenges associated with AI integration in education. These challenges encompass ethical and privacy concerns, the high costs of AI implementation, the persistence of the digital divide, and potential resistance to technological changes within educational institutions.

Integration of AI in education is a crucial focus for the European Commission, which has developed a comprehensive strategy to promote AI adoption across various sectors, including education. This strategy emphasizes the importance of ethical guidelines, significant investment in AI research, and the creation of a robust digital education action plan. A key component of this strategy is the Digital Education Action Plan (2021-2027) – DEAP (2021-2027), which aims to foster the effective use of digital technologies and develop digital skills across Europe. This plan seeks to ensure that educational institutions are equipped to integrate AI in ways that enhance learning and teaching experiences (European Commission, 2020). It is important to note that the plan emphasizes the importance of digital literacy and





competency among both educators and students. By prioritizing digital skills, the plan ensures that all stakeholders in the education system can effectively utilize AI tools and resources. This includes providing training programs and professional development opportunities for teachers, enabling them to harness AI technologies to improve their instructional methods and engage students more effectively. DEAP (2021-2027) focuses on the development and dissemination of high-quality digital learning materials and platforms. These resources are designed to leverage AI to create personalized learning experiences that cater to the individual needs of students. By utilizing AI algorithms, these platforms can analyse student performance data and provide customized recommendations and feedback, thereby enhancing the learning process and outcomes. This personalized approach not only supports students in their academic journey but also helps educators identify and address learning gaps more efficiently. It also advocates for significant investment in AI research and innovation. This includes funding for projects that explore new AI applications in education, such as intelligent tutoring systems, adaptive learning environments, and AI-driven assessment tools. By fostering a culture of innovation, the plan aims to keep Europe at the forefront of AI advancements in education, ensuring that the latest technologies are integrated into the classroom. This investment also extends to the development of infrastructure, such as high-speed internet and modern digital devices, which are essential for the effective deployment of AI tools in schools and universities. Ethical considerations are a cornerstone of the European Commission's strategy for AI integration in education. The plan underscores the need for AI systems to be transparent, fair, and accountable. This involves implementing robust data protection measures to safeguard student privacy and prevent misuse of personal information. Additionally, the plan calls for the establishment of ethical guidelines that govern the use of AI in education, ensuring that AI applications do not perpetuate biases or inequalities. By addressing these ethical concerns, the European Commission aims to build trust among educators, students, and parents, thereby facilitating the widespread adoption of AI technologies. The DEAP (2021-2027) also highlights the importance of collaboration and partnership. It encourages cooperation between educational institutions, technology providers, and policymakers to create a cohesive ecosystem that supports AI integration. This collaborative approach ensures that the diverse needs and perspectives of different stakeholders are considered, leading to more effective and inclusive AI solutions (European Commission, 2020).

Another important initiative is the AI4EU project, a European Union-funded platform that provides collaborative resources and expertise in AI (AI4EU, 2021). In the context of education, the AI4EU initiative supports the development of AI-driven tools and applications that can significantly enhance personalized learning. These tools can automate administrative tasks, thereby allowing educators to focus more on instruction and student engagement. Additionally, AI4EU supports teachers by providing AI applications that can help deliver more effective instruction tailored to individual student needs. By implementing advanced AI





algorithms, these tools can analyse vast amounts of data on student performance, preferences, and learning behaviors. This data-driven approach allows for the creation of customized learning paths that adapt to the individual needs and pace of each student, thus making learning more efficient and effective. Personalized learning facilitated by AI ensures that students receive the right support and resources at the right time, promoting better engagement and understanding of the material (AI4EU, 2021). The AI tools also facilitate differentiated instruction, where teachers can cater to diverse learning styles and abilities within the same classroom. The collaborative nature of AI4EU is another key aspect that enhances its effectiveness in integrating AI in education. By bringing together experts from academia, industry, and educational institutions, AI4EU fosters a multidisciplinary approach to AI development and deployment. This collaboration ensures that the AI tools and applications are grounded in cutting-edge research and best practices, and are designed to address the real-world challenges faced by educators and students. The platform provides a space for knowledge exchange and innovation, where stakeholders can share insights, develop new solutions, and continuously improve AI applications for education (AI4EU, 2021). AI4EU's commitment to ethical AI practices aligns with the broader European strategy for AI integration. This involves implementing safeguards to protect student data and privacy, ensuring that AI algorithms do not reinforce biases, and promoting the ethical use of AI in educational settings. By adhering to these principles, AI4EU aims to build trust among educators, students, and parents, facilitating the widespread adoption of AI technologies in education (AI4EU, 2021).

The European Commission's AI Watch initiative is a comprehensive monitoring framework aimed at assessing and analysing the development, adoption, and impact of artificial intelligence (AI) across Europe (AI Watch, European Commission, 2024). Launched to support the European Union's AI strategy, AI Watch provides valuable insights into AI advancements, policy implementations, and the socio-economic effects of AI technologies. By gathering and disseminating data on AI trends, the initiative helps policymakers, researchers, and stakeholders make informed decisions to foster the ethical and effective integration of AI in various sectors, including education, healthcare, and industry. Within the AI Watch framework several European countries have developed their national AI strategies, emphasizing the integration of AI in education (AI Watch, European Commission, 2024).. For example, France's national strategy includes the 'AI for Humanity' program, which specifically supports the development of AI applications in the educational sector. This program aims to harness AI to create innovative learning solutions and improve educational outcomes [4]. Similarly, Germany's AI strategy highlights the use of AI to enhance educational results and foster the development of digital competencies among students (Government of France, 2018). These national strategies illustrate the commitment of European countries to leverage AI technologies to advance their educational systems.





These efforts by the European Commission and individual European nations highlight a coordinated approach to integrating AI into education. The strategies focus on ensuring that AI adoption is ethical, research-driven, and beneficial to the educational community. By fostering collaborations, investing in AI research, and developing national policies, Europe aims to lead the way in creating an AI-enhanced educational landscape that is both innovative and inclusive.

The integration of AI in education offers numerous benefits that can significantly enhance the educational experience for both students and educators. One of the most profound advantages is the ability of AI technologies to provide personalized learning (Holmes, W., et. al, 2019). By analyzing vast amounts of data on student performance, AI can tailor educational experiences to meet the individual needs, preferences, and learning speeds of each student. This customization enables the provision of targeted recommendations and resources, which can greatly enhance the overall learning process. Another significant benefit of AI in education is the enhancement of administrative efficiency, where a variety of routine administrative tasks, such as grading, scheduling, and reporting can be automated with AI tools. This automation not only reduces the workload on educators but also allows them to allocate more time to teaching and engaging with students. As a result, the overall efficiency of educational institutions is improved, enabling them to operate more effectively (Luckin, R., 2016).

AI-driven tools also provide substantial support for teachers. These tools can offer valuable insights into student progress, helping teachers to identify learning gaps and suggest appropriate intervention strategies. By leveraging these insights, teachers can deliver more targeted and effective instruction, which can lead to improved educational outcomes (Sonkar, S. 2023). This support system empowers teachers to enhance their instructional methods and better cater to the diverse needs of their students. Accessibility in education can be significantly improved with AI, particularly for students with disabilities (Seale, J. 2013). The development of assistive technologies powered by AI, such as speech recognition and text-to-speech applications, can provide critical support for students with visual or hearing impairments. These technologies enable such students to participate more fully in educational activities, thereby fostering a more inclusive learning environment.

While the integration of AI in education presents numerous advantages, it also introduces several significant unique limitations that must be carefully considered. One of the primary concerns is related to ethical and privacy issues (Binns, R., 2018). The implementation of AI in educational settings necessitates the collection and analysis of vast amounts of student data. This raises critical concerns about data security and student privacy. Additionally, there is a potential for bias in AI algorithms, which can lead to unfair or discriminatory outcomes (Binns, R., 2018).. Ensuring that AI systems are transparent, fair, and accountable is essential to address these ethical and privacy concerns effectively. Another substantial limitation is the high cost associated with the development and deployment of AI technologies in education.





Implementing AI requires significant financial investment, which includes the costs of developing AI-driven tools, purchasing necessary hardware and software, and training staff to use these new technologies effectively. Many educational institutions, particularly those with limited budgets, may find it challenging to secure the necessary funding and resources to adopt AI, thereby hindering its widespread implementation (Zawacki-Richter, 2019). The digital divide also poses a significant barrier to the adoption of AI in education. This divide refers to the gap between those who have access to modern information and communication technologies and those who do not (Van Dijk, J. 2020). Students and schools with limited access to technology and reliable internet connectivity may be unable to benefit equally from AI-driven educational tools. This disparity can exacerbate existing inequalities in education, as students from underserved communities may lag behind their peers in accessing and utilizing AI-enhanced learning resources. Moreover, there is often resistance to change among educators and institutions when it comes to adopting new AI technologies. This resistance can stem from various factors, including a lack of understanding of AI, fears of job displacement due to automation, and skepticism about the effectiveness of AI in improving educational outcomes (Selwyn, N. 2019). Overcoming this resistance requires comprehensive professional development programs to educate and train educators on the benefits and applications of AI in education, as well as addressing their concerns and misconceptions. Thus, while AI holds great potential to revolutionize education, addressing ethical and privacy concerns, high implementation costs, the digital divide, and resistance to change is crucial for its successful integration. By proactively tackling these limitations, educators and policymakers can better harness the power of AI to enhance educational outcomes and ensure equitable access to its benefits.

Overall, the European strategy for integrating AI in education highlights a forward-thinking approach to leveraging technology for educational advancement. While the potential benefits of AI in education are substantial, addressing the associated challenges is essential for successful implementation. Ensuring ethical use, equitable access, and adequate support for educators and students will be critical in realizing the full potential of AI in transforming education in Europe.

3.3.3 EU AI Act

The European Union's initiative to regulate AI, known as the AI Act, is a comprehensive attempt to encompass all possible applications of AI, assessing them based on risks they might present. Within the realm of education, this regulatory framework aims to safeguard students and educational institutions by enforcing strict compliance codes for AI developers and distributors, especially focusing on high-risk applications. This act is pivotal in ensuring that educational tools empowered by AI are safe, transparent, and fair. It also sets out to





penetrate the more technical aspects, emphasizing not just operability and efficiency but mindful and ethical usage that aligns with broader societal values.

The EU AI Act introduces a pioneering legal framework structured to safeguard EU citizens from the high-risk applications of AI, categorizing AI systems according to their implied risks to rights and safety: unacceptable risk, high risk, limited risk, and minimal risk. This classification influences how rigidly different AI systems should be regulated.

1. Unacceptable Risk: AI applications that manipulate human behavior to circumvent users' free will, or really any use of AI that can create social scoring, are forbidden.

2. High Risk: AI systems used in critical sectors, like education, where the stakes of mismanagement are significantly high, fall under stringent regulatory measures. These include mandatory risk assessment plans, high levels of data security, and rigorous standards for accuracy and reliability.

3. Limited Risk: AI interacts more mildly with personal stakes here but may shape user experiences or expectations, such as chatbots. Transparency obligations are prescribed to ensure users know they are interacting with an AI.

4. Minimal Risk: Most AI applications are relegated to presenting only minimal risk and hence enjoy more relaxed regulation within the Act.

The Act is not purely restrictive but is also directed at fostering innovation while ensuring new and existing technologies meet these strict guidelines before a wider deployment. Such a proactive and graded approach ensures that all relevant stakeholders can benefit from technology while decreasing potential ethical and safety risks typical within higher-risk sectors, like education. This dual focus protects and empowers, creating a balanced regulatory frame tailored to the broad development and application scope of AI tools in education. This detailed regulatory attention enables stakeholders to fully embrace ethical standards tailored to localized and broad-based educational contexts within the AI framework provided by the Act. Embedding ethical decision-making structures within the technological design and operational stages can significantly redefine the landscape of educational technology development. By adhering closely to the principles of FATE, bolstered by legal standards like those set out in the EU AI Act, stakeholders in the educational sector have a robust blueprint for realising the vast potential of AI in education. This ensures technology serves as a bedrock for enhancing learning processes while safeguarding the interests of all participants within the system – a steppingstone towards a more ethical future in educational technology.

