CHALLENGES FOR YOUTH POLICIES IN THE DIGITAL ENVIRONMENT USING ARTIFICIAL INTELLIGENCE TOOLS

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Abstract. The question of whether artificial intelligence can transform the way the state conducts policies for young people is both a theoretical challenge and a managerial necessity. This report explores this duality from the perspective of a line ministry tasked with designing, financing and evaluating youth programmes. The analysis combines a conceptual overview of the European regulatory framework with a critical reading of empirical experience, including the Scandinavian decisions to partially abandon digitalization in education and return to paper books. The report argues that AI brings real potential in three directions: early identification of vulnerable youth groups through predictive analytics, personalization of services and optimization of employment and mobility programmes. However, serious risks are emerging, expressed in algorithmic bias, digital exclusion, erosion of privacy and cognitive consequences of over-digitalization. The Scandinavian experience with its example and positive consequences, especially Sweden's decision to return to paper textbooks after declining reading scores, serves as a warning that technological enthusiasm cannot replace the evidence base. The conclusion is that the responsible application of AI in youth policies requires not only technical competences, but also institutional maturity: a clear legal framework in line with the EU AI Act, mechanisms for the participation of young people themselves in the design of systems, and a willingness to abandon a given solution when empirical data requires it.

Keywords: artificial intelligence, youth policies, algorithmic governance, digitalization of education, EU AI Act

JEL Classification: I28, O38, J18.

INTRODUCTION

The digital transformation of public administration is no longer a horizon, but a present, posing questions to line ministries for which neither theory nor practice have ready-made answers. Youth policies are a particularly sensitive arena for these questions, because their addressees, such as young people between 15 and 29 years old, are both digital carriers and a vulnerable group whose life trajectories depend on the quality of institutional interventions. This report poses the following central research question: how can a ministry responsible for youth policies use artificial intelligence tools in a way that expands the opportunities of young people, without deepening inequalities or violating their rights? The question is normative, but its answer requires a deep understanding of technological reality. Methodologically, the report relies on three types of sources. First, academic literature in the fields of algorithmic governance (Danaher, 2016; Yeung, 2017), digitalization of education (Mangen et al., 2013; Mangen et al., 2019; Luckin et al., 2016) and youth policies. Second, policy documents of the European Union, including the EU AI Act (European Commission, 2021) and the Council of Europe framework (Council of Europe, 2020). Third, documented national experiences of Scandinavian and Western European countries, including cases of failure of AI systems (Eubanks, 2018; Richardson et al., 2019).

MAIN CONTENT

1. Theoretical overview

1.1. Youth policies in a European context

The concept of "youth policies" is not monolithic. In the European tradition, developed and substantiated in the documents of the Council of Europe and the EU, it covers a wide range of interventions. Among them are the promotion of volunteering, non-formal education, management of transitions to the labour market, as well as the prevention of social exclusion. The EU Youth Strategy 2019–2027 organizes these interventions around three priorities, expressed in actions on engagement, connection and empowerment. As a result, the participation of young people themselves is placed categorically and unconditionally at the focus of policy development (Council of Europe, 2020).

It is important to note that the strategy precedes the massive penetration of generative AI in the public sector. This means that its basic principles of shared governance, evidence-based, as well as inclusion need to be rethought in the light of technological changes, and not simply mechanically applied.

1.2. Algorithmic governance – theories and criticisms

The concept of "algorithmic governance" describes the process by which automated systems take over tasks traditionally performed by humans. Among these tasks we can include classification, profiling, resource allocation, etc. related. John Danaher distinguishes between two models: algorithms as decision-making tools and algorithms as subjects replacing institutional judgment (Danaher, 2016, p. 246). It is the second model that raises the most serious democratic concerns, not because algorithms are necessarily worse than humans, but because they shift responsibility to an opaque system. Karen Yeung introduced the concept of "hypernudging" and defined it as a process in which AI systems do not simply offer options, but structure the environment in a way that makes certain choices practically inevitable (Yeung, 2017, p. 119). In the context of youth policies, this may mean that an algorithm designed to guide young people to appropriate programmes actually limits their real options to predefined frames and corridors for cultivating targeted behaviour. The risks of algorithmic discrimination are further analysed by Zuiderveen Borgesius (2018) in a special report for the Council of Europe.

1.3. A critical review of the digitalisation of education

The issue of digitalisation in education is perhaps the best documented and at the same time the most controversial in the current context. Meta-analyses published since the pandemic period show a mixed picture: while digital tools can increase motivation and access, they do not demonstrate consistent benefits for reading and understanding text in the necessary analytical depth. The work of Anne Mangen and her colleagues on the neurocognitive differences between reading on a screen and reading on paper is particularly revealing: reading on paper promotes longer attention spans, better retention of details, and better navigation of linear narratives (Mangen et al., 2013, p. 65). A subsequent study comparing reading on a book and a Kindle confirmed that readers of paper books showed significantly better results on measures related to the chronology and temporality of the text (Mangen et al., 2019). These findings are not abstract, as they have direct relevance to the debate about digital education that is raging in Scandinavia. The application of AI in an educational context has also been analyzed by Luckin et al. (2016), whose report outlines the real potential of intelligent learning systems. In the educational and scientific degree of the doctorate, findings of a similar nature

are the need to introduce regulation at institutional, national and international levels, which would define the frameworks for the ethical use of AI by young scientists in their research (Zahariev, 2026a).

1.4. The EU regulatory framework

The European Regulation on Artificial Intelligence (EU AI Act), adopted by the European Parliament and the Council of the EU (European Commission, 2021), introduces a risk hierarchy that is directly relevant to line ministries. Systems used for assessing students, managing access to education and social benefits, or profiling vulnerable individuals fall into the "high risk" category. This means mandatory compliance with requirements for transparency, auditing, human oversight and documentation. These are requirements for which most national administrations do not yet have the necessary capacity to implement.

2. The possibilities of AI for implementing youth policies

When talking about AI in the public sector, it is easy to remain at the level of general promises. The task of this section is more demanding and it focuses on identifying specific applications with proven or plausible effects in the field of youth policies. Perhaps the most relevant application is analytics for early identification of so-called NEET youth (Not in Education, Employment, or Training), or those youth who are not in education, employment or training. The Finnish Employment and Economic Development Service (TE Services) uses machine learning to predict which young people are at risk of entering long-term unemployment and to offer targeted support before this happens. Similar systems operate in Austria and Denmark, with results showing a more efficient allocation of consultants' resources compared to the traditional cash approach.

The personalisation of services is a second direction with real potential. Recommendation systems trained on young people's profiles can offer appropriate mobility, volunteering or training programmes in a way that is incomparably more precise than a static catalogue. The Estonian digital infrastructure X-Road, while not specifically targeting young people, demonstrates how integrating data from different state registers can eliminate administrative barriers and make services truly proactive. Hartong and Förschler (2019) analyse how data in education management functions as infrastructures of power, which raises further questions about the way such systems are designed and managed.

Last but not least, AI can support the line ministry itself as an organisation in carrying out certain actions requiring digital capacity. This includes data analysis on programme effectiveness, identifying regional imbalances in access to youth services and scenario modelling in the allocation of limited funding resources.

3. The dangers and critical European experience

The history of technological optimism in public policy is littered with warnings that were ignored until failure became apparent. In the case of AI and youth policies, we have the privilege and responsibility to learn from others' mistakes before repeating them. Perhaps the most immediate risk is digital inequality. When public services migrate to digital platforms, access to them is determined not only by the law but also by the availability of devices, internet and digital skills. For a ministry striving for social inclusion, introducing AI-based services without parallel analogue alternatives is not just a technical oversight but a political mistake. This argument is particularly well developed and defended by Eubanks (2018) in her analysis of automated social policy systems in the US. Algorithmic bias is more complex because it is more difficult to see. The Dutch case of the SyRI (Systeem Risico Indicatie) system is illustrative. Thus, a system originally designed to identify

welfare recipients de facto profiles poor neighbourhoods and ethnic minorities disproportionately, leading to flawed subsequent policies and a relevant disproportionate allocation of resources. The risks of such systems are theoretically substantiated by Zuiderveen Borgesius (2018) and empirically supported by Richardson *et al.* (2019), whose analysis of "dirty data" in predictive analytics for police patrols shows how historical biases are encoded in algorithms claiming objectivity. Data protection is a third, formally regulated but practically complex area. The GDPR provides special protection for data of persons under 16 years of age, and the processing of sensitive categories of data requires an explicit legal basis. These sensitive data include data on health, social origin and ethnicity. In reality, many AI systems in the public sector are trained on aggregated administrative data. The question of whether and to what extent this processing is lawful in each specific case remains open.

Perhaps the most eloquent warning about the risks of hasty digitalization comes from countries considered leaders in this field. Scandinavia, and in particular Sweden, has conducted a large-scale natural experiment with consequences that go beyond educational policy. In the early 2010s, Sweden invested significantly in the digital transformation of classrooms. As a result, the country is a leader in providing students with tablets instead of textbooks, and classrooms are becoming spaces saturated with interactive whiteboards and access to online learning platforms. The reality revealed by the results in PIRLS 2021 (Skolverket, 2023) expressed in the international study of reading comprehension of fourth-graders is different. Sweden has registered a significant decline in results, unlike Finnish students, whose education system is more conservative in terms of digitalization.

Research by Mangen *et al.* (2013; 2019) provides a neurocognitive basis for understanding these results: reading on paper promotes deeper comprehension, especially with linear texts and when reconstructing chronology. The Swedish Agency for Education (Skolverket, 2023) has published reports linking the decline to the reduced use of paper materials. This has led to a correction in the initial policy for classroom digitization – Sweden is introducing mandatory paper textbooks in primary education from 2023. The lesson from the Scandinavian experience, however, is not that digitalization is wrong. It is that digitalization without a sufficient evidence base is risky, even when carried out by well-intentioned and well-resourced governments.

4. Framework for action at the ministry level

The insights and examples from the previous sections should lead to concrete management conclusions. In this section, we propose a framework that is not a technical manual, but rather a set of principles and institutional conditions.

The first and most fundamental condition is regulatory compliance with the EU AI Act (European Commission, 2021). Ministries working with vulnerable groups, among which we place young people, should assume that any system that profiles, assesses or refers young people falls into the “high risk” category. This means a mandatory ex ante risk assessment before implementation, registration in the European database for AI systems and a permanent mechanism for in medias monitoring.

The second condition is the systematic involvement of young people in the design of the systems. The EU Youth Strategy explicitly calls for shared management (co-management), but in the context of AI this takes on an additional dimension. The Council of Europe (2020) provides a framework for youth participation that can be adapted to the digital context.

The third condition is the willingness to abandon a technological solution when the evidence requires it. The Scandinavian experience shows that even politically committed and well-funded governments can make mistakes when implementing digital tools (Skolverket, 2023). Data from

monitoring education systems should serve as a real correction mechanism, not just for accountability, which is confirmed in the results of the analysis by Hartong and Förschler (2019). Finally, any AI-based solution should be introduced with a parallel analogue alternative. Not because analogue is better, but because digital exclusion is a reality, a process that has been extensively documented by Eubanks (2018).

CONCLUSIONS

Artificial intelligence is not a neutral tool. It carries within it the values of the data on which it is trained, the goals set by its designers, and the institutional context in which it is implemented (Danaher, 2016; Yeung, 2017). For the line ministry responsible for youth policy, this means that the question is not "whether to use AI", but "under what conditions and with what responsibility". This report argues that these conditions are achievable, but require consistent institutional work. Predictive analytics to identify vulnerable youth, personalize services, and optimize programs are real possibilities (Luckin et al., 2016)—but only if they are accompanied by transparency, audit, and participatory mechanisms. The Scandinavian experience with the digital transformation of education (Skolverket, 2023; Mangen et al., 2013; 2019) is not an argument against technology, but an argument for an evidence-based approach.

Specific recommendations follow. The ministry should carry out an inventory of all AI or algorithmic systems currently used in the field of youth policy and assess them against the criteria of the EU AI Act (European Commission, 2021). Where systems fall into the "high risk" category, a compliance assessment should be carried out immediately. The risks of discrimination analysed by Zuiderveen Borgesius (2018) and Richardson et al. (2019) should serve as a guide for this assessment.

Last but not least, the ministry should lead a national dialogue on digital education, analogous to the Scandinavian one. The question of the balance between paper and digital learning, of screen time in educational environments, and of the cognitive consequences of over-digitalization deserves an open political debate, driven by data, not by technological enthusiasm or conservative reflex.

REFERENCES

Council of Europe. (2020). Youth policy in Europe: Country information. Council of Europe. Available at: https://www.coe.int/en/web/youth/youth-policies [Accessed 25.04.2026].

Danaher, J. (2016). The threat of algocracy: Reality, resistance and accommodation. Philosophy & Technology, 29(3), pp. 245–268. https://doi.org/10.1007/s13347-015-0211-1

Eubanks, V. (2018). Automating inequality: How high-tech tools profile, police, and punish the poor. St. Martin's Press. [ISBN: 978-1250074317]

European Commission. (2021). Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act). COM/2021/206 final. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206 [Accessed 25.04.2026].

Hartong, S. and Förschler, A. (2019). Opening the black box of data-based school monitoring: Data infrastructures, flows and practices in state education agencies. Big Data & Society, 6(1), pp. 1–12. https://doi.org/10.1177/2053951719853311

Luckin, R., Holmes, W., Griffiths, M. and Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. Pearson. Available at: https://edu.google.com/pdfs/Intelligence-Unleashed-Publication.pdf [Accessed 25.04.2026].

Mangen, A., Olivier, G. and Velay, J. L. (2019). Comparing comprehension of a long text read in print book and on Kindle: Where in the text and when in the story? Frontiers in Psychology, 10, p. 38. https://doi.org/10.3389/fpsyg.2019.00038

Mangen, A., Walgermo, B. R. and Brønnick, K. (2013). Reading linear texts on paper versus computer screen: Effects on reading comprehension. International Journal of Educational Research, 58, pp. 61–68. https://doi.org/10.1016/j.ijer.2012.12.002

Richardson, R., Schultz, J. M. and Crawford, K. (2019). Dirty data, bad predictions: How civil rights violations impact police data, predictive policing systems, and justice. NYU Law Review Online, 94, p. 192. https://doi.org/10.2139/ssrn.3333423

Skolverket [Swedish National Agency for Education]. (2023). PIRLS 2021: Läsförmågan hos svenska elever i årskurs 4 i ett internationellt perspektiv [Reading ability among Swedish students in Year 4 in an international perspective]. Skolverket. Available at: https://www.skolverket.se/sok-publikationer/publikationsserier/rapporter/2023/pirls-2021 [Accessed 25.04.2026].

Yeung, K. (2017). 'Hypernudge': Big Data as a mode of regulation by design. Information, Communication & Society, 20(1), pp. 118–136. https://doi.org/10.1080/1369118X.2016.1186713

Zahariev, A. (2026a). Artificial Intelligence in the Educational and Scientific Degree „Doctor“: Digitalization, Regulation and Credit Acceleration. Fourth national scientific-practical conference with international participation digital transformation of education - issues and solutions (Book of abstracts), p. 6. https://www.conf-dte.bg/proceeding-abstracts.html

Zahariev, A. (2026b). Artificial Intelligence in the „Doctor“ Degree (Presentation). Fourth national scientific-practical conference with international participation digital transformation of education - issues and solutions, ResearchGate, 30 pages, https://doi.org/10.13140/RG.2.2.15951.65446

Zuiderveen Borgesius, F. J. (2018). Discrimination, artificial intelligence, and algorithmic decision-making. Council of Europe, Directorate General of Democracy. Available at: https://www.rm.coe.int/discrimination-artificial-intelligence-and-algorithmic-decision-making/1680925d73 [Accessed 25.04.2026].