THE STATE OF ARTIFICIAL INTELLIGENCE AND EDUCATION ACROSS EUROPE

The results of a survey of Council of Europe member states

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EDUCATION FOR DEMOCRACY

COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

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Cover and layout: Documents and Publications Production Department (SPDP), Council of Europe

Cover photo: Shutterstock

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Executive summary

The Council of Europe's Steering Committee for Education Policy and Practice (CDPPE)[1] launched a new project in 2019 as part of the 2020-2021 "Education for Democracy" programme. This initiative, entitled "Artificial Intelligence and Education", aims to explore the implications of artificial intelligence (AI) and AI-based technologies and applications in education. The project aims to examine how learning with AI, learning about AI, and preparing for AI can contribute to upholding the Council of Europe's core values of human rights, democracy and the rule of law.

The Covid-19 pandemic accelerated the adoption of digital platforms in education, including AI technologies such as adaptive tools and chatbots. However, there is a lack of empirical studies on their effectiveness, as well as a lack of mapping of AI policies and strategies in education across member states.

Following this initiative, the Council of Europe launched a survey to its member states, with the aim of gathering data to better understand how member states address the different connections between AI and education. This report provides an overview and analysis of the survey conducted.

The survey objectives were to identify promising policies and strategies related to AI and education, to identify successful practices in learning with AI, learning about AI and preparing for AI, and to examine the Council of Europe's involvement and potential role in supporting the development of appropriate policy and legal instruments.

The conclusions drawn from the survey highlight several key findings. Firstly, member states have established general policies and strategies for AI but lack specific policies for AI and education. Stakeholder consultation, particularly with teachers, parents, and students, is necessary to develop specific AI and education policies. Secondly, there is a lack of rigorous monitoring and regulation in education regarding AI, emphasising the need for co-ordinated efforts at the national and European levels. Thirdly, evidence on the impact of AI in education is lacking, which is crucial for informed decision making and the implementation of regulatory measures. Lastly, AI literacy primarily focuses on educational institutions, with limited training for teachers and staff, indicating the need for a broader perspective on AI literacy and dedicated resources.

In summary, the survey findings emphasise the importance of developing specific AI policies and strategies for education implementing effective monitoring and regulatory measures, generating evidence on AI's impact, and promoting comprehensive

1. Since 2022 the CDPPE is the former Steering Committee for Education (CDEDU). The Council of Europe's Steering Committee for Education (CDEDU, formerly Steering Committee for Education Policy and Practice).

AI literacy across the education sector. These actions will ensure responsible, fair, accountable, and transparent connections between AI and education in alignment with the Council of Europe's values and for the common good.

The responses to the survey were limited in detail and lacked concrete information, due to a lack of participation from all member states and, likely, the absence of extensive knowledge on the subject. Consequently, the survey results are deemed inadequate and would benefit from a re-evaluation to obtain more accurate and comprehensive findings. Further research is necessary to gather more appropriate results and provide clarity on the matter.

Chapter 1

Introduction

Background

In recent years, there has been a growing connection between artificial intelligence and education. This connection includes: i. learning with AI, using AI technologies to enhance teaching and learning; ii. learning about AI, how AI works, and how to create it; and iii. preparing for living in a world affected by AI (henceforth: preparing for AI), preparing all citizens for the implications of AI for all our lives. Each of these connections entails multiple opportunities, but also challenges and risks. It is crucial that the benefits outweigh the risks. For example, it is essential to ensure that AI does not undermine inclusion or equity in education, or increase the digital divide, especially for those who are most vulnerable.

The Council of Europe is already examining the impact of AI in general on human rights, democracy and the rule of law. In particular, the Ad hoc Committee on Artificial Intelligence (CAHAI) undertook multistakeholder consultations to examine the feasibility and potential elements of a legal framework for the development, design and application of artificial intelligence. The CAHAI has now been superseded by the Committee on Artificial Intelligence (CAI), which is tasked by the Council of Europe's Committee of Ministers "to examine, on the basis of broad multi-stakeholder consultations, the feasibility and potential elements of a legal framework for the development, design and application of artificial intelligence, based on Council of Europe's standards on human rights, democracy and the rule of law".[2]

Now the Council of Europe is also focusing on the impact of AI on education and the implications of AI and AI-based technologies and applications for education. The Council of Europe's Steering Committee for Education Policy and Practice launched the project "Artificial Intelligence and Education" to explore how learning with AI, learning about AI and preparing for AI will contribute towards the Council of Europe's core values of human rights, democracy and the rule of law.

The Covid-19 pandemic forced education systems to make greater use of digital platforms and applications, in many cases adopting emergency remote teaching practices rather than established online learning strategies.[3] Some of these have

2. https://edoc.coe.int/en/artificial-intelligence/9648-a-legal-framework-for-ai-systems.html and https://assembly.coe.int/LifeRay/APCE/pdf/Communication/LeafletAI-EN.pdf.
3. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning.

involved AI technologies, such as adaptive tools, chatbots and e-proctoring. However, while such tools are widely used in educational settings across Europe, there remain few empirical studies to demonstrate their validity or efficacy. There is also a lack of mapping of AI policies and/or strategies and practices in education in member states. Given the potential impact and the fast-paced development of AI and education, co-ordinated action and common policies and strategies are of key importance – to facilitate the effective exchange of promising practices among member states and to ensure that the connections between AI and education are all developed with respect of the Council of Europe values and for the common good.

Survey objectives

The survey aimed to gather data from the Council of Europe member states to enable a better understanding of the different connections between AI and education.

The specific objectives were to:

- identify promising policies and/or strategies focused on the connections between AI and education that safeguard the fundamental rights and freedoms of learners and complement existing work by other organisations;
- identify promising practices in relation to i. learning with AI, ii. learning about AI and iii. preparing for AI;
- inform the working conference held in September 2022 as part of the Council of Europe's work programme (2023-2025) on artificial intelligence and education through the lens of human rights, democracy and rule of law; and
- facilitate the Council of Europe to develop appropriate policy and legal instruments to ensure that the connection between AI and education is responsible, accountable, transparent, aligned with the values of the Council of Europe and for the common good.

Survey structure

The survey included six parts, comprised background information and three themes: 1. Policies/strategies, 2. Current practices and 3. Regulations (Figure 1).

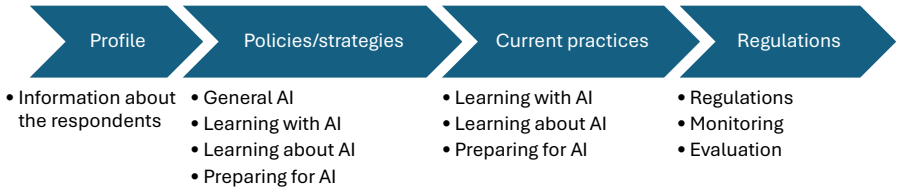

Figure 1. Topics enquired about in each of the three themes: policies/strategies, current practices and regulations

The survey contained 65 questions, distributed as follows.

- **Profile** (seven questions)
  This section collects the background information on the responding member state.
- **Part I – Policies and/or strategies for artificial intelligence (in general) and artificial intelligence and education** (24 questions)
  In this section existing policies and/or strategies in the member states, starting with general and moving onto education-related ones, are mapped.
- **Part II – Learning with artificial intelligence** (10 questions)
  In this section information was sought about the use of AI technologies to support teaching and learning.
- **Part III – Learning about artificial intelligence** (six questions)
  In this section information was sought about the teaching and learning of AI (how it works and how to create it).
- **Part IV – Preparing for artificial intelligence** (nine questions)
  In this section information was sought about how citizens are being prepared to live in a world increasingly affected by AI, and how and what strategies AI developers are using to develop AI responsibly.
- **Part V – Regulation, accountability, monitoring and evaluation** (nine questions)
  In this section information was sought about how the connections between AI and education are regulated, monitored and evaluated in the member states. In addition, information was elicited about which accountability mechanisms are in place to ensure AI development in the context of education is responsible and attuned to human rights, democracy and the rule of law.

Survey launch

The intention was that the survey was to be completed or co-ordinated by the ministries of education in the 46 member states. As policies and/or strategies concerning AI and education and the AI systems themselves may be developed by various organisations (such as public authorities, directorates, think tanks, private organisations, civil society or academia), the ministries were asked to contact those needed to help them provide a holistic picture of AI and education in their country.

The survey was developed and conducted with Survey Monkey. The invitation and link to the survey were distributed via e-mail from the Council of Europe. The survey was launched in September 2022 and participation was possible until the end of October 2022.

Respondents

Responses were received from 28 member states. Three were deleted since the answers were null (empty). Hence, the analysis presented here includes the responses from 25 member states.

Chapter 2

Policies and/or strategies for AI

General AI policies and/or strategies

The survey explored existing policies and/or strategies in the member states, starting with general AI policies and/or strategies and moving onto education-related policies and/or strategies.

In total, 21 member states reported that they have a national general AI policy and/or strategy (Figure 2), and 12 of them continue to work on further developments (Figure 3). Two member states do not have a general AI policy in place but work on development. This makes, in total, 14 member states currently working on the development of general AI policy and/or strategy, and nine member states that are currently not in the development phase. One member state reported that it has no general AI policy and/or strategy and that it is not working on one.

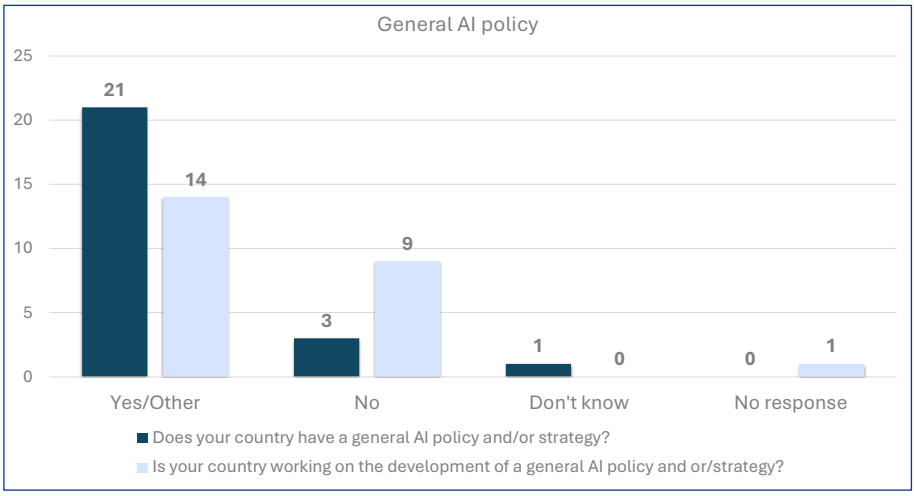

Figure 2. Responses of member states regarding their general AI policies and/or strategies

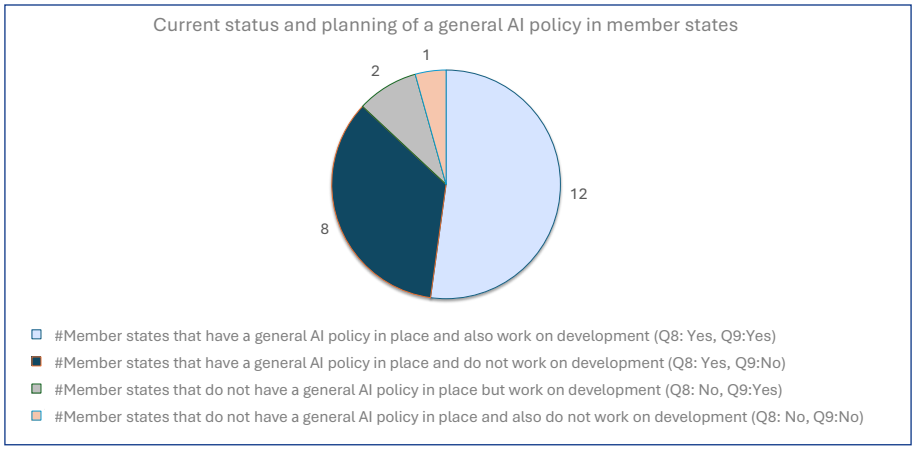

Figure 3. The current status and planning of a general AI policy in member states

The survey participants reported that their national AI development strategy includes: 1. planning interventions and investments (in technical infrastructure, in education and training for digital skills, in the use of AI in public administration), 2. the continuation of a pro-innovation approach to regulate AI, and 3. the preparation of a general work agenda on digitisation. Other participants reported that they are still assessing the need for AI regulation and/or do not have a specific AI strategy but do have an overall action plan for digital transformation.

Measures to inform stakeholders

Fifteen member states reported that they have measures in place to inform stakeholders about developments, while four member states stated they have no measures in place (Figure 4). Member states also reported that they have consulted stakeholders from academia (23 out of 25 member states), policy makers (23 out of 25 member states) and the private sector (22 out of 25 member states) on general AI policies. Participants reporting that "other" (n=6) stakeholders were involved/consulted in the development of their country's overall AI policy/strategy mentioned public bodies in the fields of cybersecurity, public procurement, consumer protection bodies, data protection authorities, regulatory bodies and potential users.

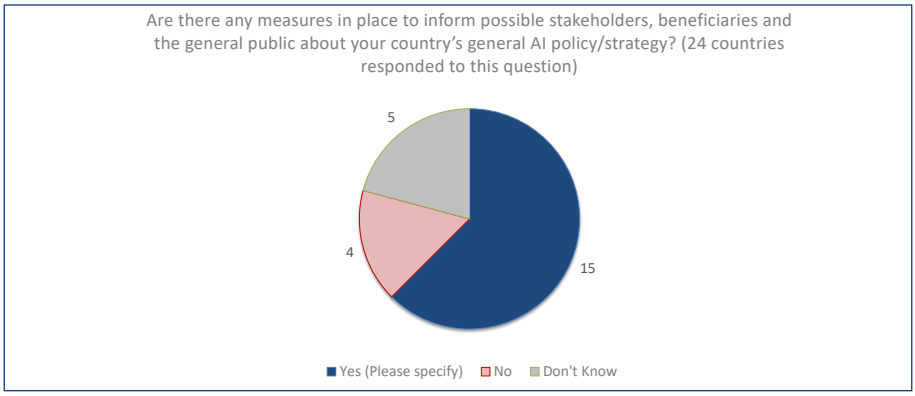

Figure 4. Measures in place to inform possible stakeholders about the member states' general AI policies/strategies

The general AI policies have been communicated via information sessions (17 out of 25 member states) and social media (14 out of 25 member states) (Figure 5).

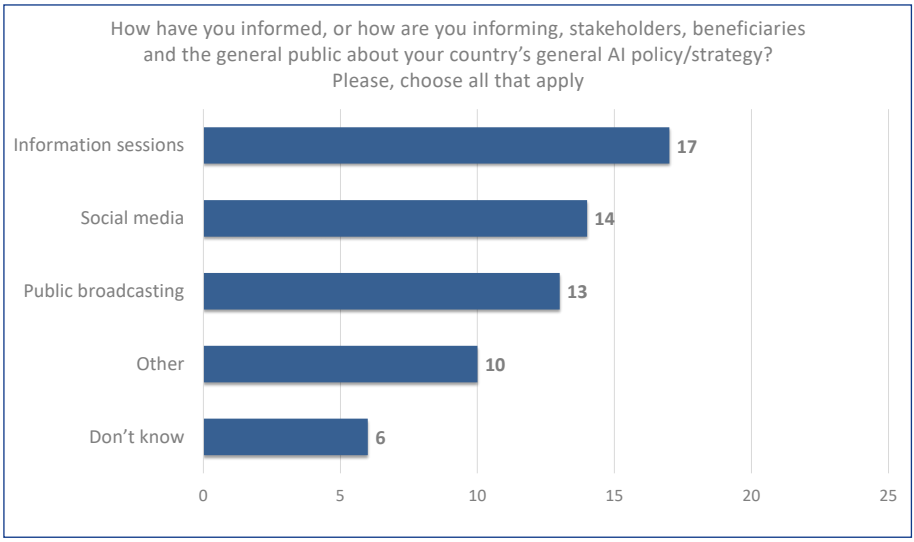

Figure 5. The communication channels that member states use to inform stakeholders regarding general AI policies/strategies

Participants reporting other forms of information dissemination methods (n=10) mentioned: workshops, conferences, meetings with direct stakeholders, public initiatives and consultations, publications and official government portals.

Educational issues addressed in general AI policies/strategies

Most member states (22 out of 25) reported that educational issues are specifically addressed in their general AI policies (Figure 6).

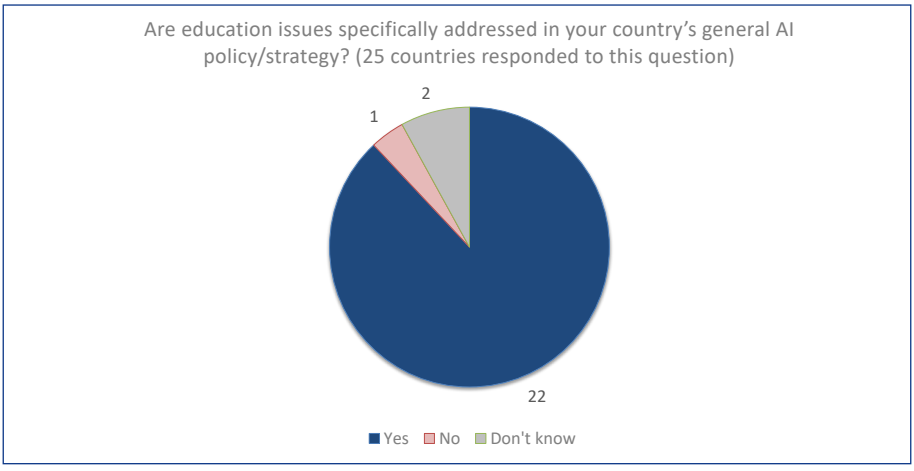

Figure 6. Educational issues addressed in general AI policies/strategies of the member states

Respondents reported that they involved policy makers (19 out of 25) and stakeholders from academia (18 out of 25) and the private sector (18 out of 25) to develop their AI and education policies. Teacher representatives, learners and parents of learners were the least-involved stakeholders (Figure 7).

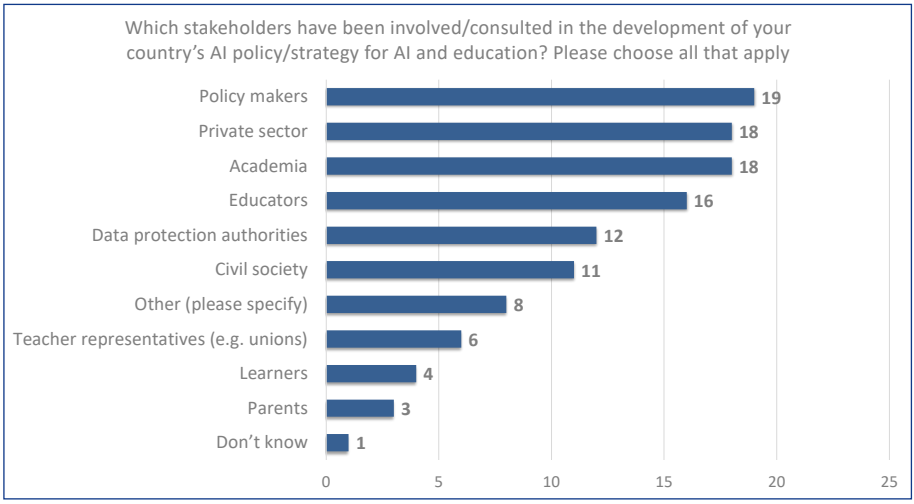

Figure 7. Stakeholders' involvement in the development of the general AI policy/strategy for AI and education of the member states

An analysis of the participants' reports of education issues specifically addressed in their country's AI policy/strategy are summarised below:

- **AI literacy (technological dimension).** Recognising that it is one of the main challenges, most national policies give centrality to the strengthening of teachers' digital skills and competences associated with the field of artificial intelligence, covering the different levels of education, including vocational education and lifelong learning. Overall, there is a clear recognition that teachers need to acquire or regularly update their digital skills (for example "make teachers digitally proficient"; "digitally literate teachers and pupils"; and "train a new generation of teachers").
- **AI literacy (human dimension).** There is an emerging recognition that curricula for teaching AI should not be limited to technology but should focus on educating informed individuals who can deal with both the technical, ethical, social and societal aspects of AI as an area of digitisation. The need to prepare parents and teachers for the proper protection of children is occasionally mentioned. It is often recognised that teaching AI needs to expose students to discussions about the ethical choices that will often be part of programming and algorithm design (for example "discuss the ethical choices"; "take into account AI ethics"; and "protect the rights of participants in the education system"). In certain national contexts, it is recognised that in cases where AI systems provide professional support to qualified personnel in their daily work in schools, they should be able to be provided with a capacity to check and correct the AI systems adopted.

- **Using AI to learn about learning.** The need for more evidence-supported research around the opportunities and limits of adopting learning progress assessments in self- directed learning is mentioned, including looking at ways in which learning analytics can and cannot be used by considering ethical and data protection aspects (for example "self- determination" and "the right to control one's data"). The adoption of data analysis systems is also aimed at the administrators of educational institutions to provide experiences for students (for example "to make informed decisions").
- **Learning with AI.** The personalisation of learning is the most common trend present in the national policies that mention a strategic investment on teaching-learning practices with AI (for example "adaptation of learning to personal needs" and "customised education"). In specific cases, collaboration with private-sector experts is encouraged to obtain support in the preparation of teaching materials and the implementation of the teaching process. Some national documents concretise plans with targets set to achieve progressively more citizens benefiting from AI-supported education. A priority is highlighted for developing personalised, data-driven and digitally assisted forms of learning to fully support individual learning paths. In some national contexts, the creation of awards for teachers who take the lead in using AI is mentioned.

Regulation, monitoring and evaluation of AI and education

Only five member states reported that AI and education (including learning with AI, using AI to learn about learning, learning about AI and preparing for AI) are regulated and only four reported that AI and education are monitored or evaluated. Nine (out of 25) member states reported that they do not regulate AI and education, while ten (out of 25) do not monitor or evaluate them. Almost half of the respondents (11 out of 25) either did not know or did not provide a response to the questions about regulation, monitoring and evaluation of AI and education (Figure 8).

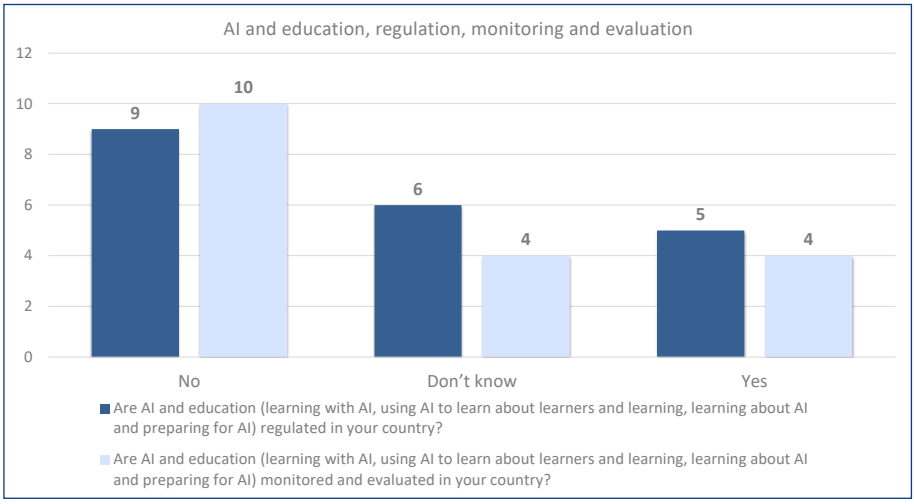

Figure 8. Regulation, monitoring and evaluation of AI and education

Research funding for AI and education

Funding for research on the efficacy of learning with AI is provided in ten (out of 25) member states. In eight member states research on human and societal implications of AI and education is funded. Respondents from ten member states did not have or did not know about any large programmes that fund research into the societal implications of AI and education; similarly nine respondents did not have or did not know about any programmes to fund research on the efficacy of AI and education.

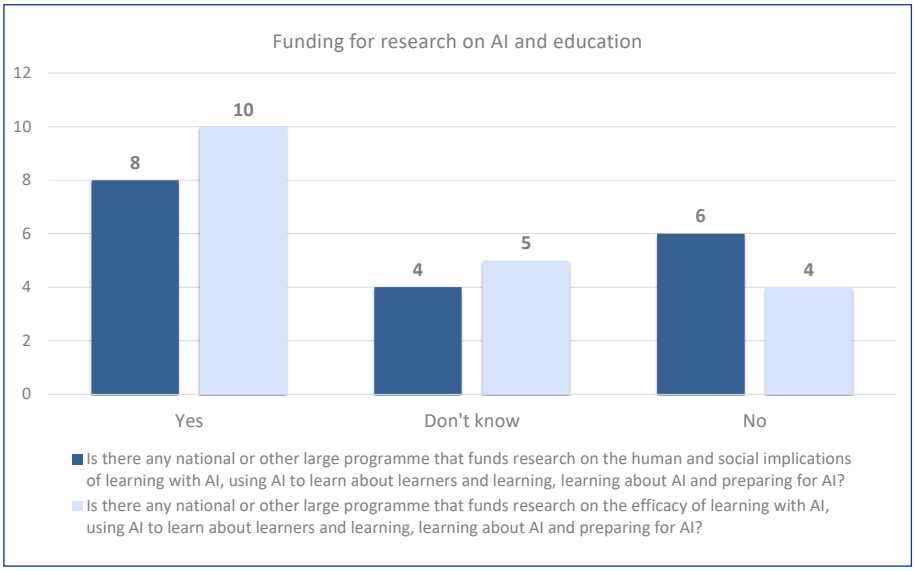

Figure 9. Funding for research on the efficacy, human and social implications of AI and education

Chapter 3

Policies, strategies and practices for AI in education

The survey explored the use of AI technologies to support teaching and learning, including AI systems in educational contexts and the use of AI to learn about learning.

Policies for the use and implementation of AI systems in education

While 4 out of 23 member states reported that they have specific policies for the use and/or implementation of AI systems in education, nine member states reported that they are currently discussing, planning or implementing policies about AI systems in education, most of them as part of a general AI national plan. Six member states reported that there are no relevant policies in place (Figure 10).

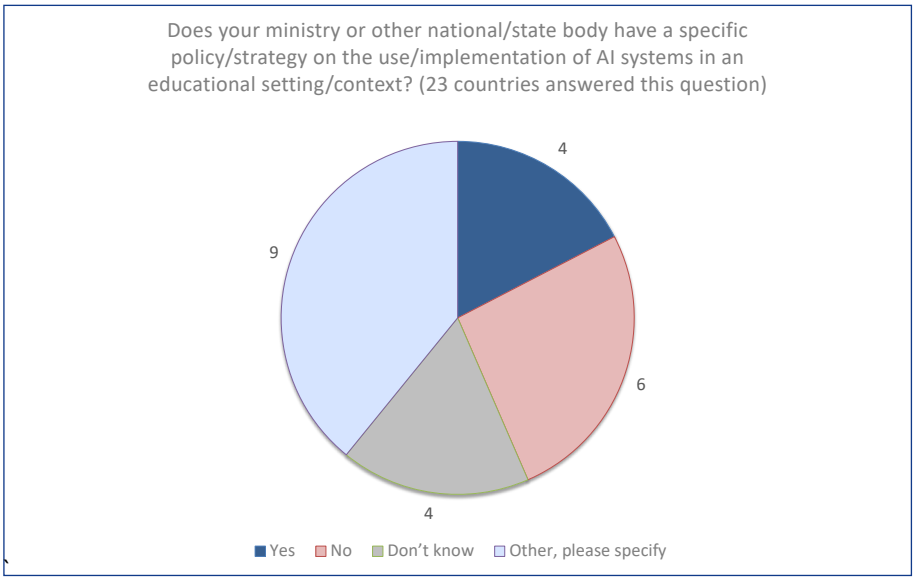

Figure 10. Policies for the use and implementation of AI systems in education

Budget for the development of policies on the use of AI systems in education

Most of the member states reported that either they do not know whether there is a specific budget for the development of such policies (10 out of 22) or that there is no budget available (9 out of 22) (Figure 11).

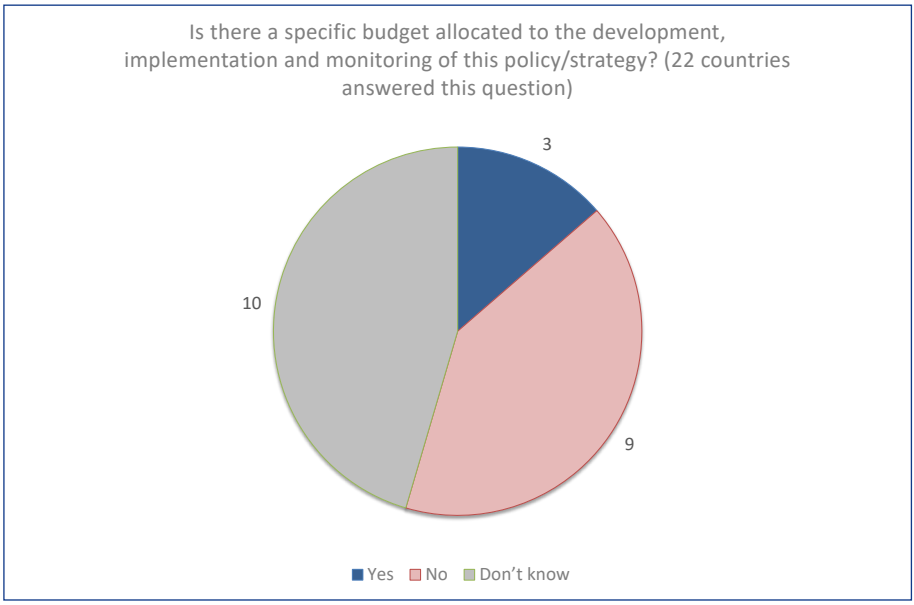

Figure 11. Budget for the development of policies on the use and implementation of AI systems in education

Most member states reported that there are no policies in place on the use of AI to learn about learning (11 out of 23) and no related budget (11 out of 20). Some member states indicated that these topics are addressed in their general AI strategy or that they will be addressed in AI and education policies currently under development. Other member states also referred to policies related to learning about AI.

Governance policies for the use of AI systems in education

Almost one third of the member states (7 out of 25) did not respond to the question about governance policies (Figure 12). Data policies for AI systems in educational contexts exist in 15 member states, while ethical policies exist in nine member states. Meanwhile, only three member states include evidence policies (these member states include all three levels of policies addressed in the question, that is data, ethical and evidence policies). One of these member states provided additional detail, specifying that their Department for Education is developing policies to support the use of AI systems in educational settings/contexts, including an education privacy assurance scheme for the strengthening of data protection in the education sector. An AI code of practice is also being developed. This is on the understanding that educational institutions are data controllers in their own right, and hence the decision to use

this technology is solely their own. The government will provide guidance on what legislation must be considered when making decisions.

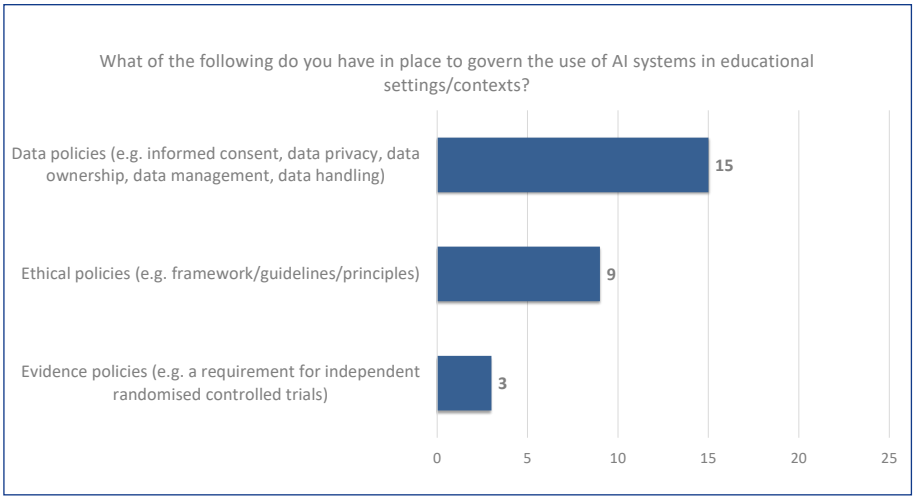

Figure 12. Governance policies for the use of AI systems in education

Decisions about the use of AI systems in education

One third of the member states (8 out of 25) did not respond to this question (Figure 13). At a national level, decisions about systems to be promoted are taken by seven member states, decisions about permitted systems are taken by seven member states and decisions about what systems to support are taken by six member states. Only four member states make decisions at all levels. Several member states reported that they have a decentralised school system which leaves such decisions up to the school administration (school directors, municipalities), which take decisions on the use and acquisition of specific software (the national government is therefore not directly involved). Other responses reported that only systems developed by the state are promoted/recommended and supported.

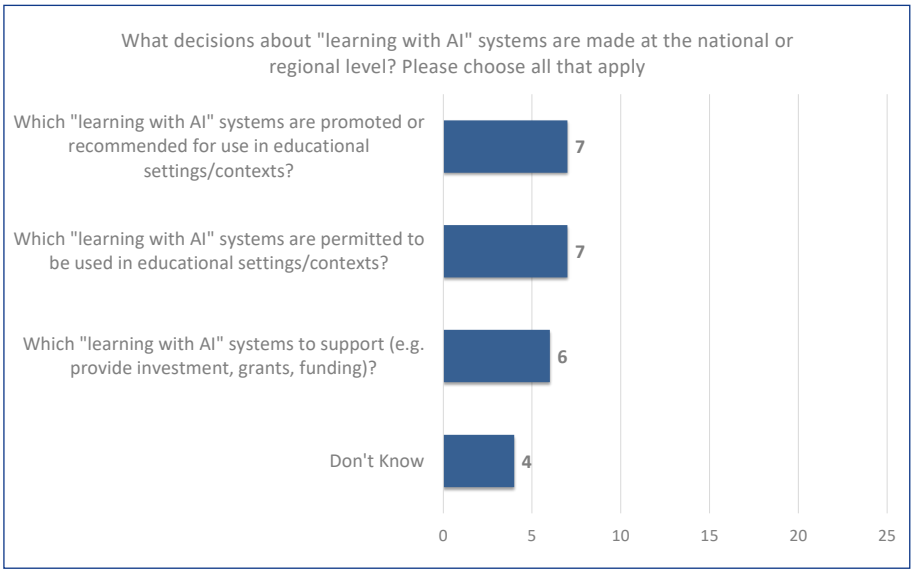

Figure 13. Decisions about the use of AI systems in education

Development sources of popular AI systems in education

Of the 19 member states who responded to this question, 11 reported that the commercial sector had implemented the most popular AI systems in education, while 10 reported that research centres had done so. The two member states that include social entrepreneurs also include the commercial sector or research centres, respectively. No member state uses all three development sources. Two member states reported that these decisions are left to individual schools while one member state provided an example of a portal in which the schools can share best practices and experiences (Figure 14).

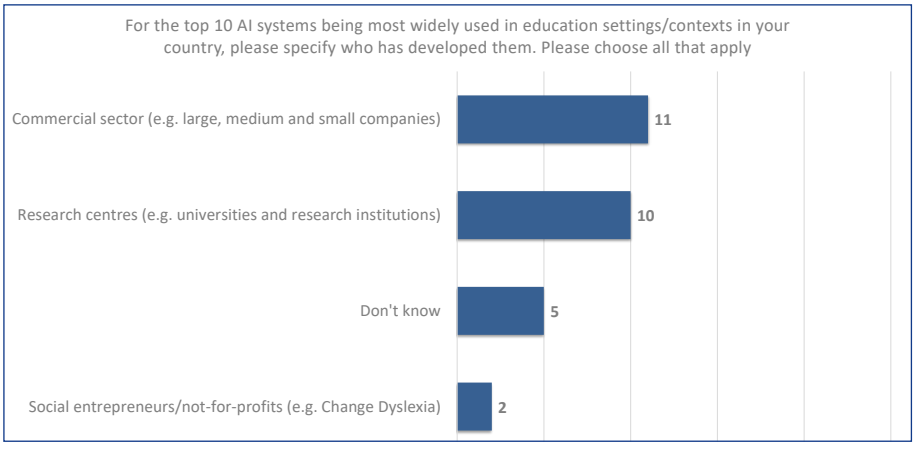

Figure 14. Development sources of popular AI systems in education

AI-based technologies per education level

Of the 20 member states who responded to this question, 15 reported that AI-based technologies are being used in lower secondary school levels, while 16 reported that they were being used in upper secondary schools (16 member states). Fewer member states reported that AI-based technologies are used in higher education (that is tertiary level) (13 out of 20), vocational education training (13 out of 20) and primary education (11 out of 20). Only one member state reported using AI-based systems at all levels (Figure 15).

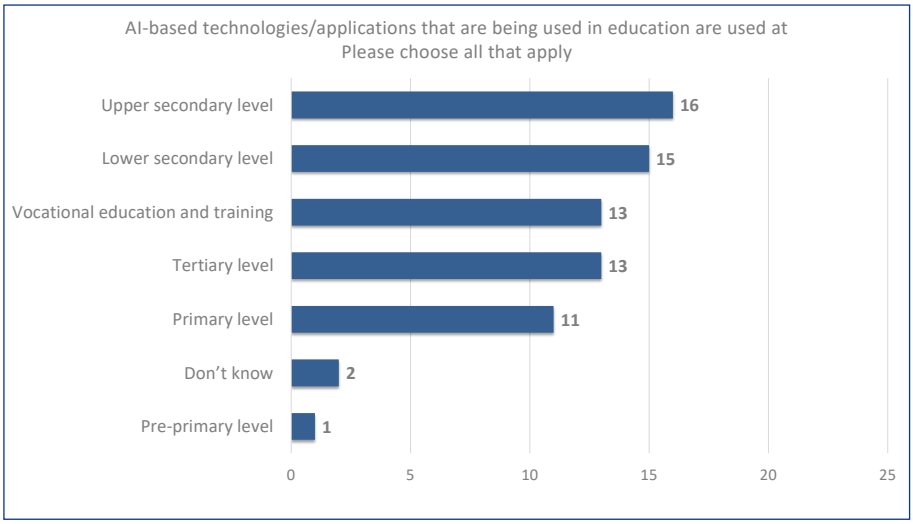

Figure 15. AI-based technologies per level of education

AI systems in education and purpose of use

Of the 20 member states that responded to the question about the use of AI in their education systems, most reported that AI is used for organisational management tasks, such as administration (10 responses), student monitoring (six responses), attendance and registration (six responses), exam proctoring (six responses), admissions (four responses), retention and prediction of dropouts (three responses) and teacher performance evaluation (four responses). Others reported that AI is used for student assessment tasks, and specifically in formative assessment (six responses) and in summative assessment (five responses). Five member states reported that they do not use AI for any of the suggested tasks, while only one member state reported using AI to inform national strategies (Figure 16).

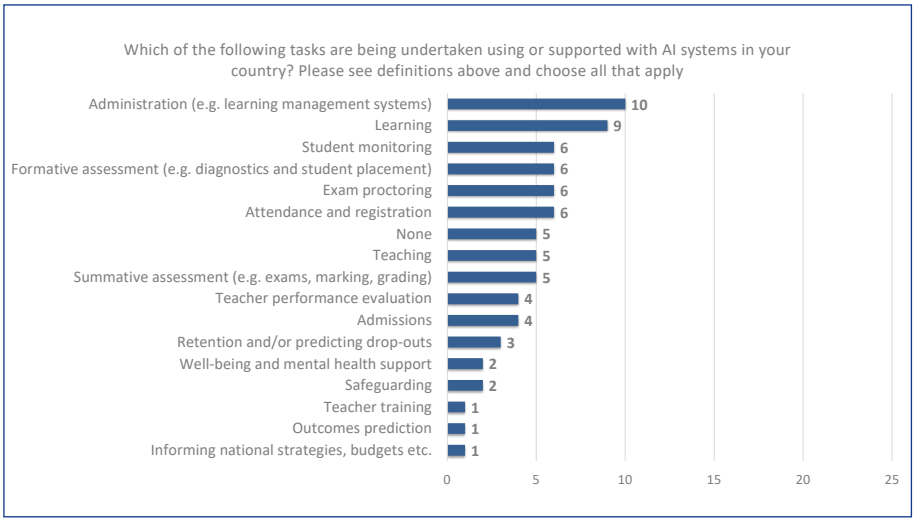

Figure 16. AI systems in education and purpose of use

Several examples of tasks and specific AI systems used to support these tasks were provided, including the following (names of specific AI systems and links are removed due to responses' anonymisation purposes): online learning materials explaining the basic functioning/benefits of AI systems; early warning and pedagogical support systems for preventing early school dropouts; e-procuration portals, admissions support systems, attendance and registration portals; teacher performance assessment tools, summative assessment tools; speech recognition or automatic translation facilitation; chatbots and other virtual learning assistants.

AI systems in teaching and learning

Of the 21 member states that responded to a question about specific uses of AI systems in teaching and learning (Figure 17), most reported that they used adaptive learning systems (12 responses), personalised learning environments (six responses), intelligent interactive environments (four responses), exploratory learning environments (four responses), dialogue-based tutoring systems (four responses), embodied AI and robotics (three responses) and intelligent tutoring systems (two responses).

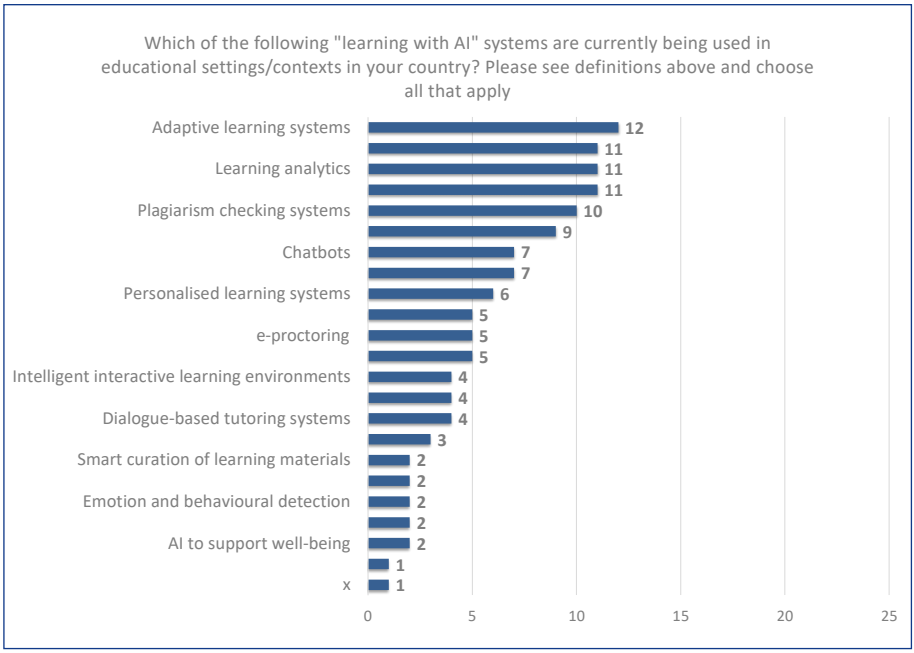

Figure 17. AI systems in teaching and learning

Examples of such systems named in the responses include software systems and suites such as Google for Education, Zoom and Microsoft Teams; learning management systems such as Moodle and Blackboard; plagiarism checkers (such as Turnitin); and online proctoring systems (such as Examus and ProctorExam). There was also a strong emphasis on language-based technologies, including speech to text (11 responses), AI-enabled language learning (10 responses), plagiarism detection (10 responses), chatbots (seven responses) and writing evaluation (five responses). Learning analytics (11 responses) and educational data mining (five responses) are also reported. Only a very limited use of emotion detection, biometrics and well-being support was reported (each having only two responses). It is important to note that some approaches go by many different names (for example adaptive learning, personalised learning and intelligent tutoring systems).

Chapter 4

Policies, strategies and practices for AI literacy

The survey also explored the policies, strategies and practices for AI literacy, that is learning about AI and preparing to live with AI.

Policies for teaching and learning about AI and the budget allocated for developing these policies

Eight out of 23 member states (Figure 18) reported that they have specific policies on teaching/learning about AI technologies or that they have addressed this topic in "Other" ways (7 out of 23), for example as part of other national strategies or that there is planning to address this in the future. Five out of 23 reported they have no specific policies on teaching/learning about AI technologies in place.

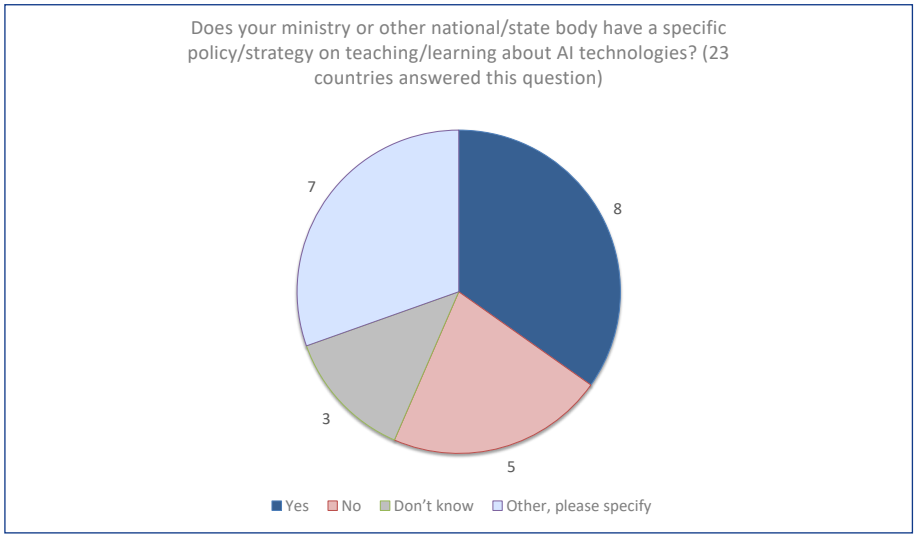

Figure 18. Policies for teaching and learning about AI

Ten out of 22 member states reported that no specific budget is available for such policies, and 9 out of 22 reported that they are not aware of the existence of any such budget (Figure 19).

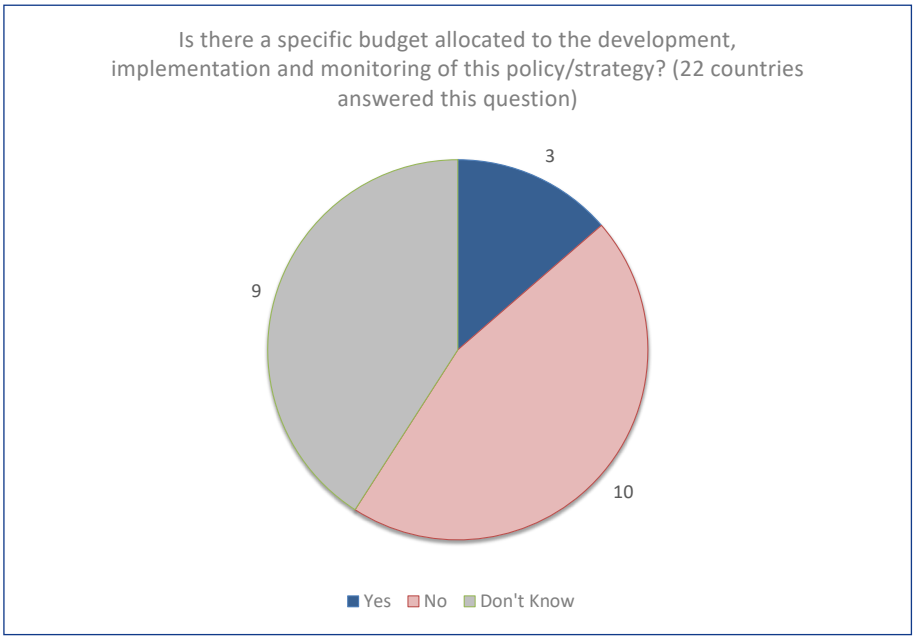

Figure 19. Budget for the development of policies for teaching and learning about AI

When asked whether learning about AI is addressed in other educational settings/contexts such as vocational education and training (VET), member states reported the following examples: free massive open online courses (MOOCs), university courses (for example the University of Cambridge's Master of Studies in AI Ethics and Society) and specialisation courses for upper VET students.

Policies for preparing to live with AI and the budget allocated for developing these policies

Some 10 out of 23 member states reported that there are policies in place for preparing to live with AI (Figure 20). However, there is no specific budget dedicated to develop such policies (8 out of 20) or they are not aware about any such budget (8 out of 20) (Figure 21).

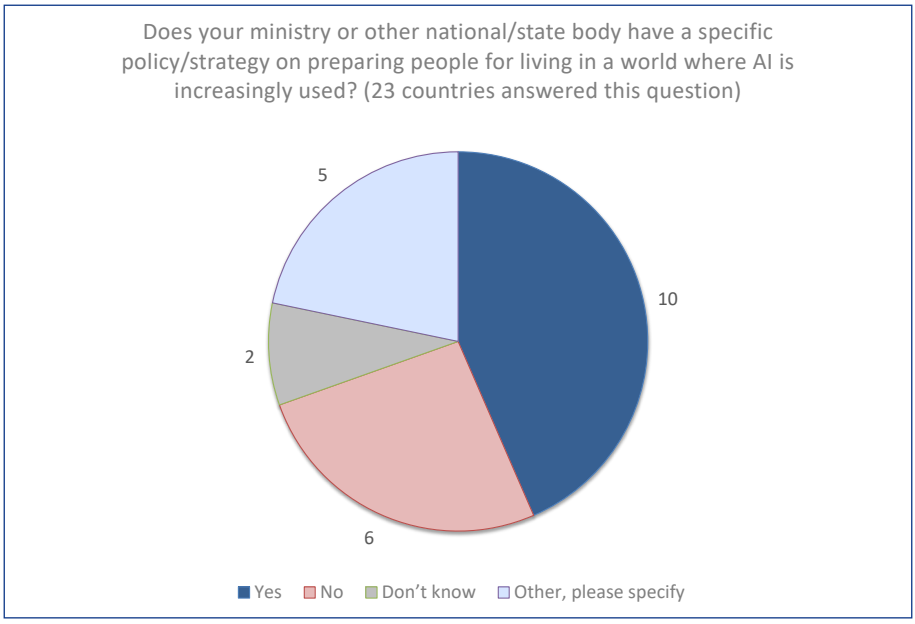

Figure 20. Policies for preparing to live with AI

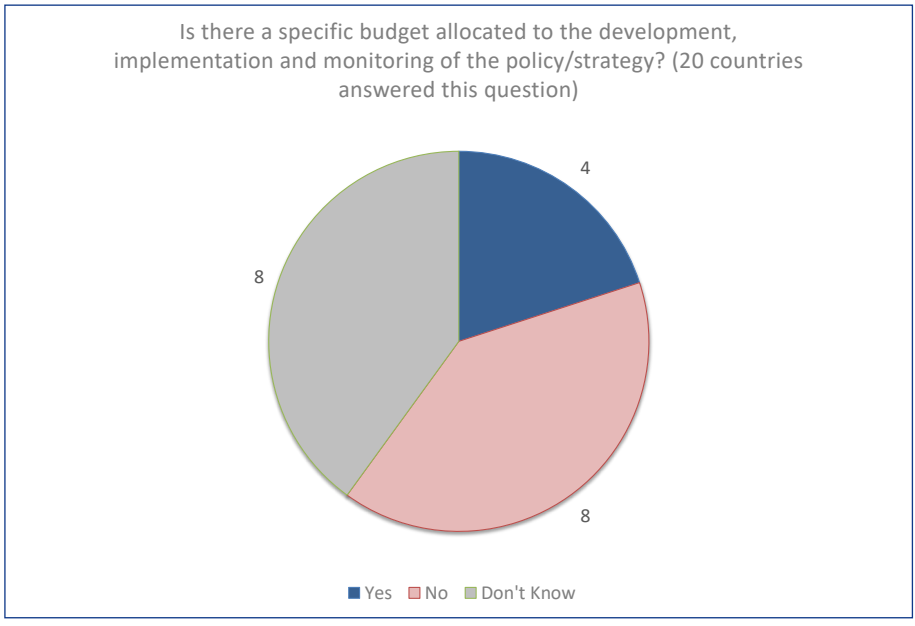

Figure 21. Budget for the development of policies for preparing to live with AI

The answers (5 out of 25) to the question on whether the general public is being prepared for the impact of AI on their lives do not provide a conclusive basis for perceiving if such plans exist at the national level and/or if they are implemented; respondents refer to initiatives that fall under the domain of AI training and competency framework development (for example DigComp 2.2., training programmes for pupils, students and teachers on AI ethics, online risks, cybersecurity and internet safety).

Learning about AI and preparing for AI in higher education

At Bachelor level, 14 member states address learning about AI and 11 member states address preparing for AI (Figure 22). This is almost matched at master's degree level – 12 and 10 member states, respectively. Responses on relevant topics taught in higher education did not provide sufficient information. Of the 12 responses obtained, three member states replied not applicable or did not have enough data to answer. Most of the remaining member states emphasise the existence of a holistic approach of the courses around a general appreciation on the effects of technology on society, without giving specific attention to AI.

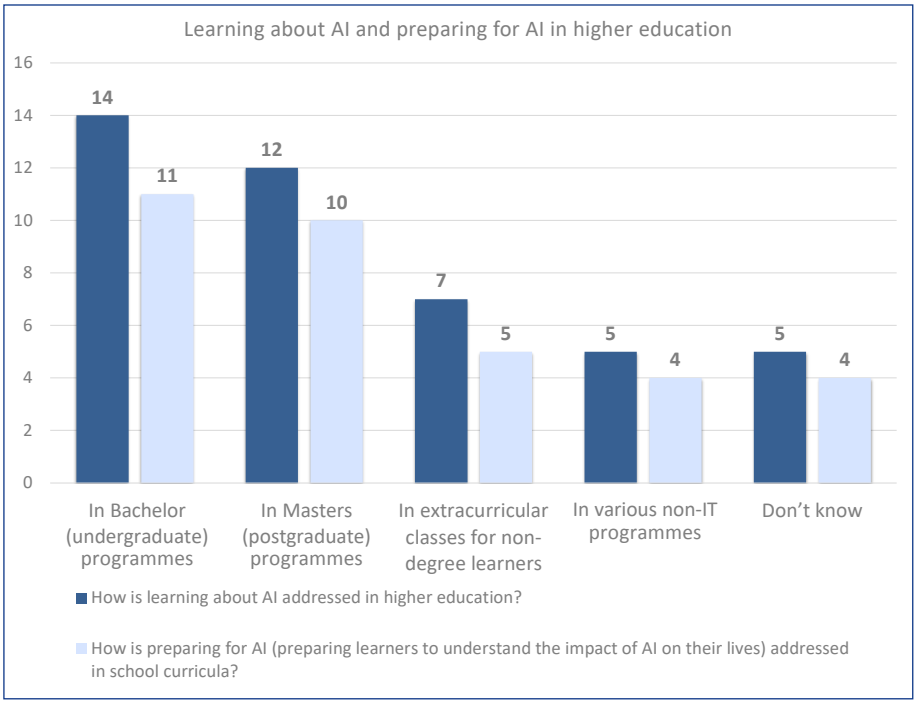

Figure 22. Learning about AI and preparing for AI in higher education

Learning about AI and preparing for AI in schools

Schools tend to address learning about AI in IT/computer science classes (15 member states) or in other subjects (15 member states) (Figure 23). The same two categories cover preparing for AI. While every respondent could indicate how learning about AI is addressed in schools, four indicated that they did not know how preparing for AI is addressed in schools. Relevant topics that are taught in schools include: media literacy, information literacy, data privacy, cyber resilience, internet safety/online protection. It should be noted that key topics, such as fairness, human rights, data ownership and ethics were occasionally mentioned in the responses.

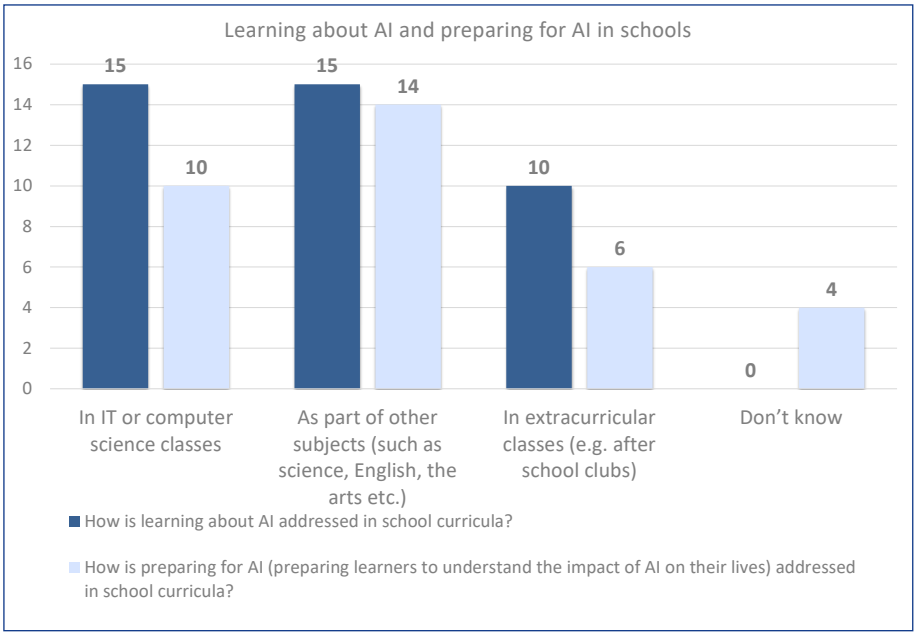

Figure 23. Learning about AI and preparing for AI in schools

Teaching and learning about AI in other contexts

Some 19 member states have responded regarding teaching and learning about AI in other contexts than higher education and school curricula (Figure 24). Respondents were asked to select all that apply to their country. One third (8 out of 25) include teaching AI for higher education academic staff. The numbers are smaller for teacher training. Only one member state includes administrator training and just two member states include educational sector employees. The following topics are taught to the general public to prepare them for the impact of AI on their lives: cybersecurity, privacy, ethics, protection against discrimination.

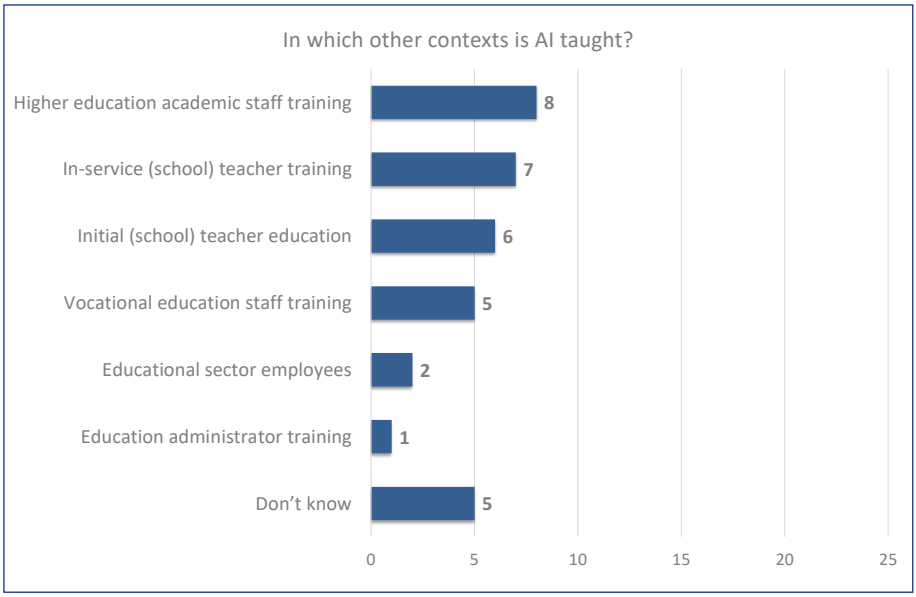

Figure 24. Teaching and learning about AI in other contexts

Responses that elaborate on how learners in other educational settings/contexts are being prepared for the impact of AI on their lives mention vocational training, free MOOCs and lifelong learning courses.

Chapter 5

AI and education and Council of Europe values

Finally, the survey asked how the member states ensure that their approaches to learning with AI, using AI to learn about learners and preparing for AI address the Council of Europe values of human rights, democracy and the rule of law.

Responses emphasise the centrality of the role given to current school curricula and the curricular reforms planned for the coming years, as well as to the development and implementation of legally binding instruments aimed at regulating the design, development and application of AI systems.

Lastly, responses highlight the importance of the Council of Europe values for the member states and reiterate that these values should be addressed when working or learning with AI, without however providing further information or clarifications as to how this will be achieved.

Chapter 6

Conclusions

This report presented the analysis of survey responses from 25 member states during September to October 2022, aiming to clarify the connections between AI and education from the perspective of the Council of Europe member states and, in particular, a. to identify promising policies and/or strategies focused on the connections between AI and education; b. to identify promising practices in relation to learning with AI, learning about AI and preparing for AI; c. to facilitate the Council of Europe in developing appropriate policy and legal instruments for safeguarding responsible, fair, accountable and transparent AI and education.

Addressing education aspects in AI policies and strategies

Most member states have either established general policies and strategies for the use of AI or are in the process of doing so. However, AI and education are not addressed as a special or separate case demonstrated by the lack of specific AI and education policies. This is also reflected by the evident lack of consultation with key stakeholders, such as teachers, parents and students for drafting AI policies.

In order to promote AI and education while ensuring that the core values of the Council of Europe are respected, we perceive as necessary for member states to establish AI policies and strategies dedicated to education aspects rather than rely on general AI frameworks. We envision that the key stakeholders, such as teachers, parents and students, should be actively involved and consulted in the development of such specific-purpose policies and strategies since they are directly and explicitly affected by them.

Monitoring and regulation, particularly in education

Although member states have in place or work towards establishing general AI policies, these policies do not include rigorous monitoring and regulation approaches for education. Only five member states reported that AI and education (including learning with AI, using AI to learn about learning, learning about AI and preparing for AI) are regulated, and only four of them reported that AI and education are monitored or evaluated.

The lack of adequate monitoring and regulation, particularly in education, is critical since technological advancements happen very fast. To accommodate the rapid changes, critical decisions regarding AI and education are left to schools, municipalities

and the regional administration, while there are no regulatory bodies across the states to safeguard AI and education.

We highlight the need for common, orchestrated efforts at the national and European levels towards establishing monitoring and regulatory actions that will protect education stakeholders from potentially negative or harmful consequences of AI, particularly in education.

Evidence used for AI adoption in education

In terms of the adoption of policies, there is the need for evidence about the impact of AI in education to inform decision making and to guide the implementation of monitoring and regulatory measures. Currently, there seems to be a lack or scarcity of such evidence, which is particularly alarming if we consider the lack of regulatory approaches in education, for example trials, which are common practice in other domains such as healthcare.

We argue for the necessity of placing such practices for AI in education due to the impact these technologies can have on humans, and in particular children.

Need for a broad view on AI literacy

AI literacy is addressed predominantly in educational institutions (secondary and higher education). At the same time, limited training is offered for school teachers, staff and education sector employees and no specific budget is dedicated to promoting AI literacy, revealing a limited view of member states.

We argue for the need for a broad view on AI literacy that will build on policies, strategies and practices for learning about AI as well as preparing to live with AI. We envision that this is critical and necessary to prepare member states and their citizens for the generalised use of AI and in the context of everyday life.

Council of Europe values and AI and education

The member states have explicitly stated the need to address the Council of Europe core values when it comes to establishing policies, strategies and legal frameworks for monitoring and regulating AI, and consequently AI and education. However, it was not clear how this could be achieved. While the Council of Europe values are addressed in education, they are not explicitly addressed in the context of AI and education.

Capacity of member states to respond

Some 46 Council of Europe member states were invited to respond to the survey using e-mail invitations sent by the Council of Europe. In total, 25 member states provided valid answers to the survey: slightly more than half the number of the member states.

It is acknowledged that, on the one hand, the length of the survey and, on the other hand, the subject of the survey might have deterred stakeholders from participating. At the same time, we believe that the participation rate is suggestive of the capacity of member states to respond to this topic.

While documenting the state of AI and education across Europe is a complicated task that demands input from various levels of national agencies, multiple roles and stakeholders, we argue that discussions about AI and education should be prioritised and actively promoted, given the importance of education with respect to human rights, democracy and the rule of law.

As a final note, it remains unclear from the analysis of the survey responses whether respondents understand the distinction between "learning with AI", "using AI to learn about learners and learning" and "preparing for AI". We perceive this distinction – further discussed in the publication of the Council of Europe *Artificial Intelligence and Education – A critical view through the lens of human rights, democracy and the rule of law* – as critical to ensure that AI and education protect and do not undermine the core values of the Council of Europe and contribute towards the common good.

Appendix

Definitions used in the survey

The definitions below were given to the participants during the survey. They could refer to the definitions when answering the survey questions.

Adaptive tutoring systems or **intelligent tutoring systems (ITS)** or **intelligent interactive learning environments** or **personalised learning systems** (NB Some of these terms are contested): AI-driven tools that might provide step-by-step tutorials, practice exercises, scaffolding mechanisms (for example recommendations, feedback, suggestions and prompts) and assessments, individualised for each student, usually through topics in well-defined structured subjects such as mathematics or physics.

AI literacy: having competences in both the human and technological dimensions of artificial intelligence, at a level appropriate for the individual (that is according to their age and interests).

AI systems: shorthand term encompassing AI-driven tools, applications, software, networks, etc.

Artificial intelligence (AI): artificial intelligence is notoriously challenging to define and understand. Accordingly, we offer two complementary definitions.

- A set of sciences, theories and techniques whose purpose is to reproduce by a machine the cognitive abilities of a human being. Current developments aim, for instance, to be able to entrust a machine with complex tasks previously delegated to a human. (Council of Europe, 2021)[4]
- Machine-based systems that can, given a set of human-defined objectives, make predictions, recommendations or decisions that influence real or virtual environments. AI systems interact with us and act on our environment, either directly or indirectly.

Often, they appear to operate autonomously and can adapt their behaviour by learning about the context. (UNICEF, 2021)[5]

4. www.coe.int/en/web/artificial-intelligence/glossary.
5. www.unicef.org/innocenti/reports/policy-guidance-ai-children#:~:text=The%20policy%20guidance%20explores%20AI,inclusion%20of%20and%20for%20children.

Artificial intelligence and education: the various connections between AI and education that include what might be called "learning with AI", "learning about AI" and "preparing for AI". Learning with AI has also been called "artificial intelligence for education".[6]

Artificial intelligence in education (AIED): an academic field of enquiry, established in the 1980s, which primarily researches AI tools to support learning (that is "learning with AI").

Automatic writing evaluation: AI-driven tools that use natural language and semantic processing to provide automated feedback on writing submitted to the system.

Big data: large heterogenous and volatile data sets, generated rapidly from different sources, which are cross-referenced, combined and mined to find patterns and correlations, and to make novel inferences.[7] The analysis of big data is too complex for humans to undertake without machine algorithms.

Chatbots: systems designed to respond automatically to messages through the interpretation of natural language. Typically, these are used to provide support in response to queries (for example "Where is my next class?", "Where can I find information about my assessment?").

Dialogue-based tutoring systems: AI-driven tools that engage learners in a conversation, typed or spoken, about the topic to be learned.

e-proctoring: the use of AI-driven systems to monitor learners taking examinations with the purpose of detecting fraud and cheating.

Educational data mining: see **learning analytics**.

Educators: shorthand term encompassing teachers and other professionals in formal education and early childhood care, including school psychologists, pedagogues, librarians, teaching assistants and tutors.

Embodied AI and **robotics**: movable machines that perform tasks either automatically or with a degree of autonomy.

Exploratory learning environments: AI-supported tools in which learners are encouraged to actively construct their own knowledge by exploring and manipulating elements of the learning environment. Typically, these systems use AI to provide feedback to support what otherwise can be a challenging approach to learning.

GOFAI: "Good old-fashioned artificial intelligence", a type of AI more properly known as "symbolic AI" and sometimes "rule-based AI", which was the dominant paradigm before machine learning (ML) came to prominence.

Intelligent interactive learning environments: see **adaptive tutoring systems.**

Intelligent tutoring tystems (ITS): see **adaptive tutoring systems.**

6. Recommendation CM/Rec(2019)10 of the Committee of Ministers to member States on developing and promoting digital citizenship education.
7. www.coe.int/en/web/artificial-intelligence/glossary.

K12: children in primary and secondary education (that is from kindergarten through grade twelve, ages 5 to 18).

Learners: shorthand term to encompass children and young people in formal education (that is pupils and students) and people of all ages engaged in formal, informal or non-formal education (in accordance with the principle of lifelong learning).[8]

Learning analytics and **educational data mining**: gathering, analysing and visualising big data, especially as generated by digital devices, about learners and learning processes, with the aim of supporting or enhancing teaching and learning.

Learning network orchestrators: AI-driven tools that enable and support networks of people (for example learners and their peers, or learners and teachers, or learners and people from industry) engaged in learning.

Machine learning (ML): a type of AI, the type that is currently dominant, that uses algorithms and statistical models to analyse big data, identify data patterns, draw inferences and adapt, without specific step-by-step instructions.

Natural language processing (NLP) or **speech to text** and **natural language generation**: systems that use AI to transcribe, interpret, translate and create text and spoken language.

Personalised learning systems: see **adaptive tutoring systems**.

Plagiarism checking: AI-driven content scanning tool that helps identify the level of plagiarism in documents such as assignments, reports and articles by comparing a submitted text with existing texts.

Profiling: the automated processing of personal data to analyse or predict aspects of that person's performance, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements.

Robotics: see **embodied AI**.

Smart curation of learning materials: the use of AI techniques to automatically identify learning materials (such as Open Educational Resources) and sections of those materials that might be useful for a teacher or learner.

Speech to text: see **natural language processing**.

8. Recommendation CM/Rec(2019)10 of the Committee of Ministers to member States on developing and promoting digital citizenship education.

This report presents the findings of a comprehensive survey conducted by the Council of Europe examining the state of artificial intelligence (AI) and education across its member states. The report explores the existing policies, strategies and practices governing the use of AI in educational contexts, with a focus on how these align with the Council of Europe's core values of human rights, democracy and the rule of law.

The survey, which involved responses from 25 member states, highlights the varied approaches to AI in education, including the development of AI literacy, the regulation and monitoring of AI technologies, and the specific applications of AI in teaching and learning. It highlights critical gaps, including the absence of dedicated budgets for AI policies in education and the need for more comprehensive regulatory and monitoring frameworks.

Further, findings underscore the need for co-ordinated efforts to establish robust regulatory frameworks, ensuring that AI's integration into education systems supports equitable and transparent practices, and emphasise the importance of developing AI literacy across all educational levels.

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The Council of Europe is the continent's leading human rights organisation. It comprises 46 member states, including all members of the European Union. All Council of Europe member states have signed up to the European Convention on Human Rights, a treaty designed to protect human rights, democracy and the rule of law. The European Court of Human Rights oversees the implementation of the Convention in the member states.

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