INCTE'25

international conference on teacher education

IX Encontro International de Formação na Docência
9th International Conference on Teacher Education

ESCOLA SUPERIOR DE EDUCAÇÃO
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Livro de Atas
Conference Proceedings

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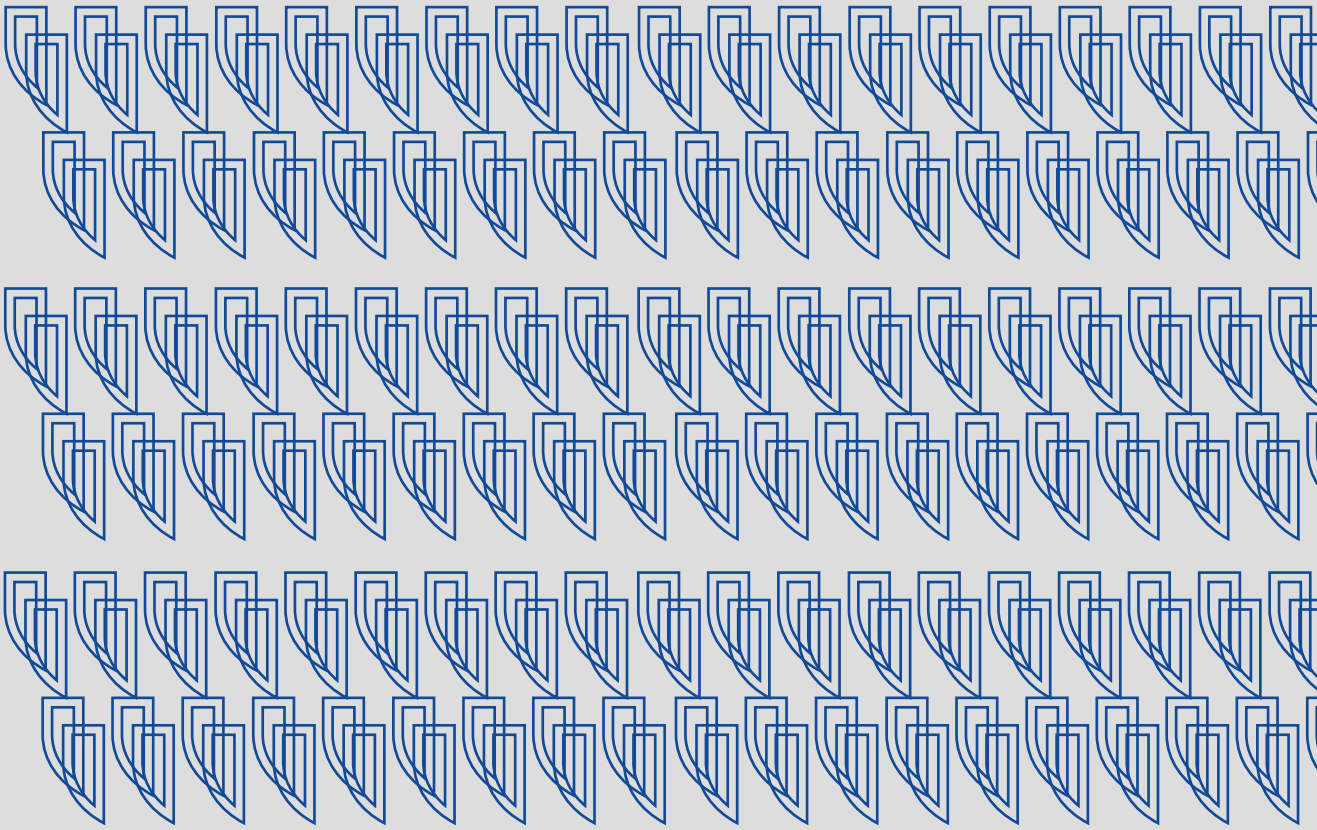
Inteligência Artificial na Educação: consciência crítica, relacional e ética

Artificial Intelligence in Education: critical, relational and ethical awareness



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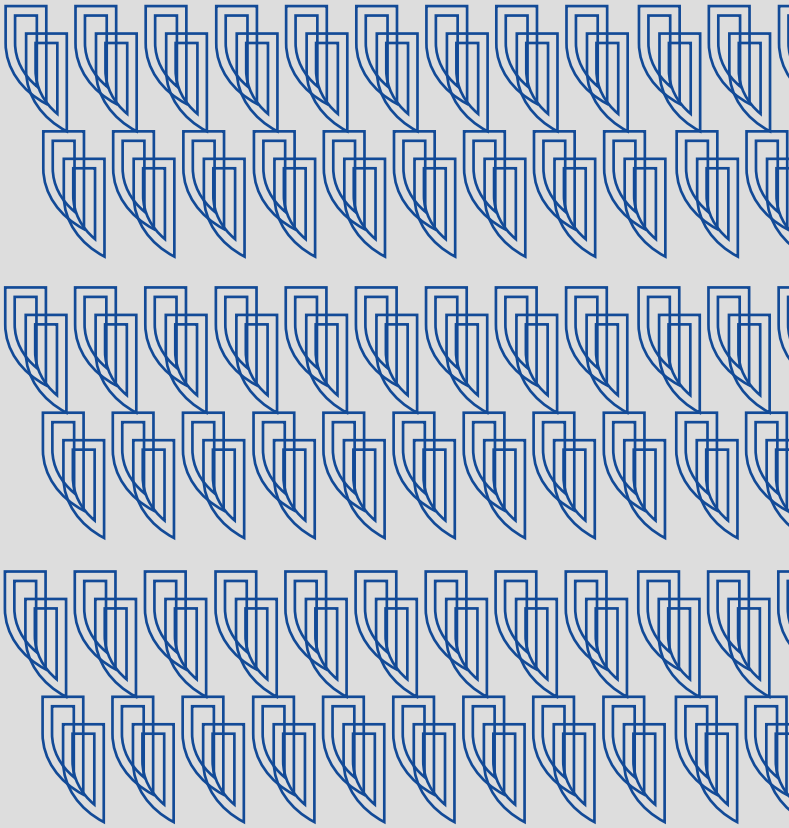

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Eixos temáticos

O Encontro estrutura-se em torno de cinco grandes eixos temáticos:

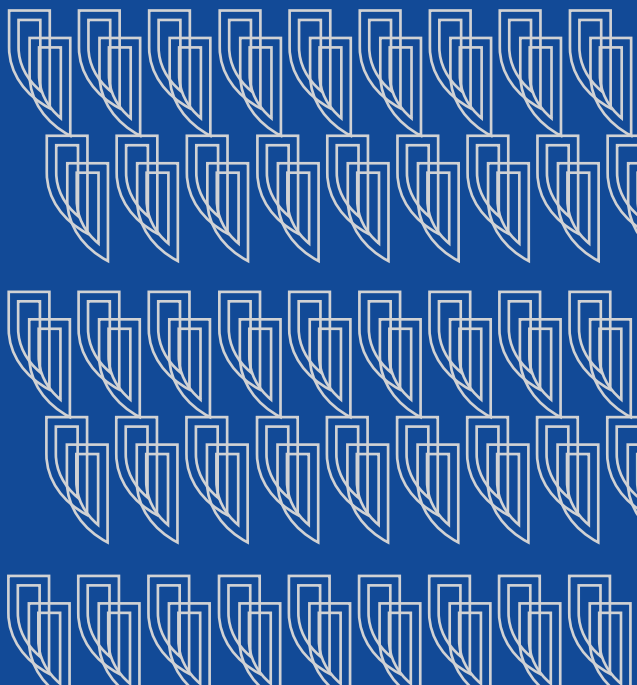
Eixo Temático 1:
Currículo e formação de educadores e professores
Este eixo temático aborda questões relacionadas com o currículo, a inovação curricular e novas perspetivas curriculares no contexto da formação inicial ou contínua de educadores e professores. Inclui a discussão de modelos e processos curriculares de vários tipos, bem como trabalhos ou propostas para a formação de educadores e professores em contextos diversos.

Eixo Temático 2:
Didática e formação de educadores e professores
Este eixo temático inclui aspetos de diferentes saberes disciplinares em contextos escolares, refletindo sobre os contributos da didática para a formação de educadores e professores na construção progressiva de formas de compreender e atuar conscientemente em situações educativas.

Eixo Temático 3:
Práticas educativas e supervisão pedagógica
Este eixo temático aborda o desenvolvimento de práticas de formação de educadores e professores em escolas, incluindo a problematização dos papéis a desempenhar por diversos intervenientes, numa perspetiva de trabalho colaborativo e construção de uma identidade profissional consciente, comprometida e responsável.

Eixo Temático 4:
Formação de professores e educação para o desenvolvimento
Este eixo temático aborda aspetos educativos do ensino e da aprendizagem relacionados com a promoção de uma cidadania global responsável. Inclui a discussão de projetos e práticas educativas que promovam a educação para o desenvolvimento.

Eixo Temático 5:
Práticas pedagógicas no ensino superior
Este eixo temático aborda questões relacionadas com os desafios pedagógicos que o ensino superior enfrenta atualmente, englobando a discussão, partilha e disseminação de experiências pedagógicas neste nível de ensino.



Thematic axes

The Meeting is structured around five major thematic axes:

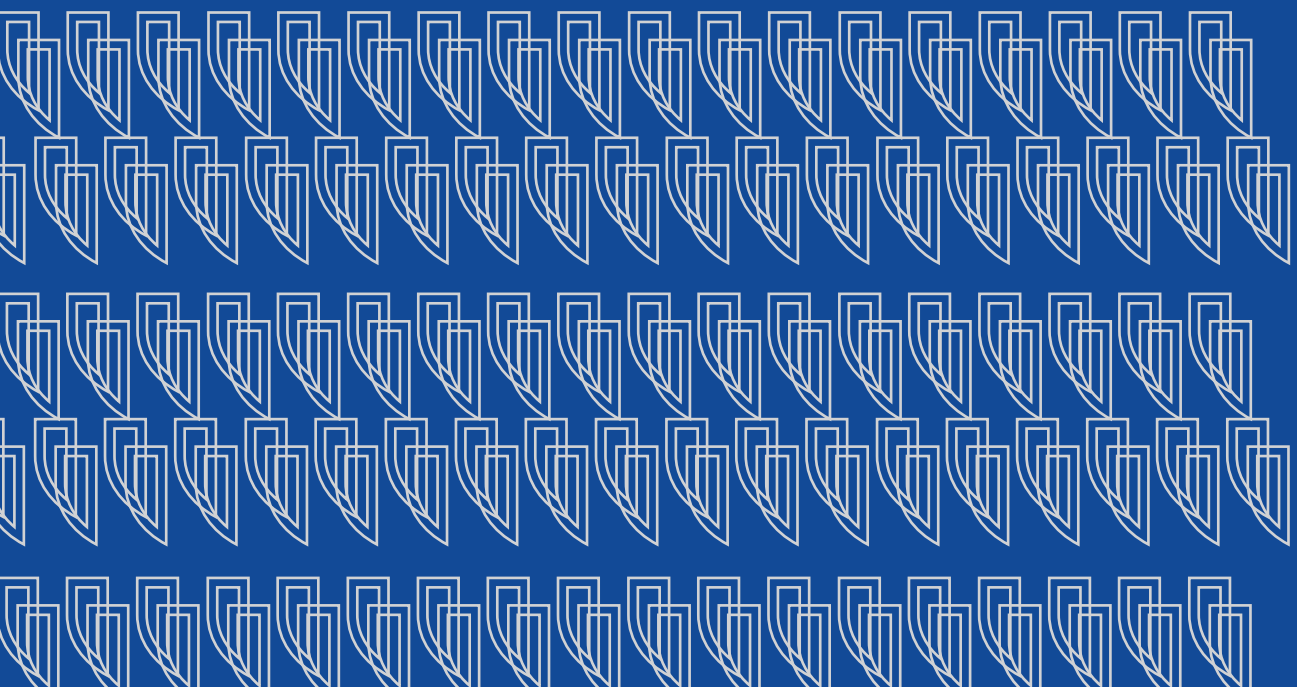
Thematic Axis 1:
Curriculum and the training of educators and teachers
This thematic axis addresses issues related to the curriculum, curricular innovation, and new curricular perspectives in the context of initial or continuing education for educators and teachers. It includes the discussion of models and curricular processes of various types, as well as works or proposals for the training of educators and teachers in diverse contexts.

Thematic Axis 2:
Didactics and the training of educators and teachers
This thematic axis includes aspects of different disciplinary knowledge in school contexts, reflecting on the contributions of didactics to the training of educators and teachers for the progressive construction of ways to consciously understand and act in educational situations.

Thematic Axis 3:
Educational practices and pedagogical supervision
This thematic axis addresses the development of training practices for educators and teachers in schools, including the problematization of the roles to be played by various stakeholders from a perspective of collaborative work and the construction of a conscious, committed, and responsible professional identity.

Thematic Axis 4:
Teacher training and education for development
This thematic axis addresses educational aspects of teaching and learning related to promoting responsible global citizenship. It includes the discussion of projects and educational practices that foster education for development.

Thematic Axis 5:
Pedagogical practices in higher education
This thematic axis addresses issues related to the pedagogical challenges faced by higher education today, encompassing the discussion, sharing, and dissemination of pedagogical experiences at this level of education.



In memoriam de Maria da Conceição Martins
Membro da Comissão Organizadora do INCTE'25

Pela seriedade com que abraçou cada desafio, pela dedicação constante e pelo contributo valioso à construção do INCTE.
A sua marca permanece no rigor do trabalho, no cuidado com os detalhes e na forma como continua a inspirar e a iluminar, discreta, mas decisivamente, o que fazemos e como fazemos.

Com gratidão e serena saudade.

Índice

INCTE'25 – IX Encontro Internacional de Formação na Docência

Artificial Intelligence in Education: Challenges and Opportunities for Pedagogical Awareness

Cláudia Martins[1] (chair), Agnė Paulauskaitė-Taraševičienė[2], Carles Sierra[3], Filipe Portela[4] (participants)
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[3]Artificial Intelligence Research Institute, Spain
[4]University of Minho, Portugal

Abstract

This article examines the impact of artificial intelligence (AI) in education, drawing on a roundtable discussion among experts in the field. The conversation, moderated by Cláudia Martins, was structured around three guiding questions: critical, relational, and ethical awareness. The article addresses the crucial distinction, raised by Agnė Paulauskaitė-Taraševičienė, between general AI and generative AI, such as ChatGPT, which is the current primary concern in the education sector. The experts argue that AI should be viewed as a partner for teachers, rather than a replacement, emphasising that human supervision is crucial in high-risk areas, such as student assessment. The article details the challenges and opportunities in the educational context, covering topics such as curriculum design, detection of learning difficulties, and the risk of AI "hallucinations". The discussion also highlights distinct points of view, such as that of Carles Sierra, who argues that the use of AI varies across different academic areas. The participation of Filipe Portela is also acknowledged. The article concludes that the successful integration of AI into education requires both teachers and students to understand and use these tools consciously and intentionally, thereby increasing student autonomy and agency.

Keywords: artificial intelligence, education, teaching, learning, generative AI.

Resumo

Este artigo explora o impacto da inteligência artificial (IA) na educação, com base numa discussão de mesa-redonda entre especialistas na área. A conversa, moderada por Cláudia Martins, foi estruturada em torno de três questões orientadoras: consciência crítica, relacional e ética. O artigo aborda a distinção crucial, levantada por Agnė Paulauskaitė-Taraševičienė, entre a IA em geral e a IA generativa, como o ChatGPT, que é a principal preocupação atual no setor educativo. Os especialistas defendem que a IA deve ser vista como uma parceira dos professores, e não como um substituto, sublinhando que a supervisão humana é crucial em áreas de alto risco, como a avaliação e a admissão de estudantes. O artigo detalha os desafios e as oportunidades no contexto educativo, abordando temas como a conceção de currículos, a deteção de dificuldades de aprendizagem e o risco de "alucinações"por parte da IA. A discussão também faz emergir pontos de vista distintos, como o de Carles Sierra, que defende que o uso da IA difere em diversas áreas académicas. A participação de Filipe Portela é igualmente reconhecida. O artigo conclui que a integração bem-sucedida da IA na educação requer que tanto professores como alunos compreendam e utilizem estas ferramentas de forma consciente e intencional, a fim de aumentar a autonomia e a agência dos estudantes.

Keywords: inteligência artificial, educação, ensino, aprendizagem, IA generativa.

1. Introduction

This paper is a synthesis of a round table discussion on artificial intelligence (AI) in education. The discussion was moderated by Cláudia Martins, who presented the structure of the debate and the experts Agnė Paulauskaitė-Tarasevičienė, from Kaunas University of Technology, Lithuania, Carles Sierra, from the Artificial Intelligence Research Institute in Spain, and Filipe Portela, from the University of Minho, Portugal.

The moderator explained that the roundtable would be guided by three principal axes: Critical Awareness, Relational Awareness and Ethical Awareness.

As far as critical awareness was concerned, the questions posed were as follows:

- How should educators critically evaluate the role of AI in shaping curriculum design and assessment practices?
- To what extent should AI influence decision-making in student evaluations, admissions, or learning pathways?
- Is there a risk of AI reinforcing existing educational inequalities? If so, how can this be mitigated?

In terms of relational awareness, the experts were asked to consider these questions:

- How does AI affect the relational dynamics between students and teachers?
- Can AI foster or hinder genuine human connection and empathy in learning environments?
- How might AI tools influence students' sense of agency, autonomy, or motivation?

Finally, the topic of ethical awareness was guided by the following:

- What ethical (including copyright and environmental) responsibilities do developers, institutions, and educators have when deploying AI in education?
- Should students be taught AI literacy and ethics as part of their education?
- Where should we draw the line between AI as a support tool and AI as a decision-maker in education?

Based on these, the experts focused on the questions they felt were most relevant to them, interacting freely with each other.

2. Clarification

The outset of the round table was marked by a crucial question raised by Agnė Paulauskaitė-Tarasevičienė, who put forth: "Are we speaking about AI, the whole AI, or just about generative AI? Why are we speaking about AI in education now?"According to her, AI means neural networks, deep learning, fuzzy logic, and optimisation algorithms. However, these aspects are not what concern educators in general, but rather generative AI. The same occurred when the internet and Google boomed, affecting education, educational materials and curricula. Currently, generative AI tools appear to be on par with previous technological advancements.

This question set the tone for the ensuing debate.

3. Critical Awareness

Responding to the initial clarification, Carles Sierra emphasised that teachers are concerned about how AI will impact curriculum design, assessment, evaluation, admissions, learning pathways, and inequalities. Questions such as the following arise: What is the role of AI? What is my role as an educator with AI in the picture?

According to Carles Sierra, it would be a mistake to consider AI as a replacement for educators' work. AI should be regarded as a partner in educational work, because AI is not a sentient entity. The expert used the metaphor of an octopus to represent AI and clarified that AI might be "an excellent octopus here. [but] It is not a dog. It is not a mammal."For him, sentient means that the experiences can be positive or negative. Thus, AI is not such an entity. It can be experiential, but it does not have an opinion on whether something is good or bad. As such, AI could never fully replace educators because it will always depend on them to determine the goals of pedagogical endeavours. The same applies to the curriculum, which educators establish within a specific social context and country. For example, Carles Sierra mentions that AI can be very good at making summaries or merging curricula, but it has no underlying intention to develop curricula in a specific manner.

Another point raised by Carles Sierra is the issue of student admissions and evaluation. As for the former, student admissions should be handled by human personnel, allowing them to ensure that procedures are followed correctly. This requirement is in line with the Artificial Intelligence Act[1], the law enacted by the European Parliament in 2024 that already mentions that these are two high-risk activities in education that authorities should give special attention to.

The same applies to the latter: AI might be excellent at giving recommendations, such as identifying patterns in data, for instance, when grading students. Nonetheless, student evaluation is an activity that must involve human supervision. Conversely, adaptive learning is an approach that has proved to be positive in many contexts. There is evidence that using adaptive learning tools for a couple of hours a week over three months can reduce students' failure rates at both the university and high school levels.

Carles Sierra also discussed a frequent criticism associated with adaptive learning, which is that it provides less privileged people with AI education, while reserving human educators for the wealthiest and most advantaged individuals. Although he disagrees with this discriminatory stance, he also pointed out that adaptive learning could become very successful in certain places, such as remote areas (e.g., Australia), where access to education is heavily restricted. The expert also addresses the generalised belief that critics tend to idealise teachers and human teaching, without acknowledging that it would often be better to access an AI system than have no access to education at all.

Filipe Portela drew on his experience as an AI professor and considered how AI can help students enhance their learning. For example, he utilises AI to assist him in correcting exams. For him, generative AI is changing the teaching environment. In the past, most classes were teacher-centred. While the teacher was teaching or writing on the board, students would copy information without any opportunity to discuss their own knowledge. Nowadays, the situation has changed dramatically, and students have access to numerous tools that enable them to be on par with their teachers. Moreover, Filipe Portela also emphasised that generative AI can be used to create content for classes, provided it is validated beforehand. However, teachers must also be aware that AI frequently hallucinates and provides incorrect information. Following on Carles Sierra's point, Filipe Portela further emphasised that "AI is a thing, and it is not smart, because it only uses the data that we put in to make some patterns, and to make some assumptions". He concludes by stating that, as humans, we are responsible for creating good content and educating students on how to use AI correctly, because allowing them to use it without understanding its capabilities is much more risky.

All in all, the experts agree that AI should be seen as a partner for teachers, not a replacement. Since AI is not a sentient entity, it lacks personal experiences or opinions. Therefore, the final decision on what is best for students always lies with the educators.

4. Relational Awareness

The underlying idea behind relational awareness is that the relationship between teachers and students is evolving, and educators need to recognise that students are already making use of AI. For

[1] Check: https://artificialintelligenceact.eu/ (accessed 21 September 2015).

Carles Sierra, AI is "the elephant in the room". Thus, the old-fashioned idea that teachers are "the depository of knowledge" that is conveyed to students is nonsensical. According to studies conducted in the labour market, a student who knows AI earns 30% and 60% more than those who have no "knowledge" of AI. These numbers indicate that, as educators, we cannot overlook the fact that students first need to be aware of AI, and secondly, they are actually using it.

On the other hand, for this expert, educators must consider how to improve their own work and how AI might assist with repetitive tasks, thereby allowing them to have more free time and deliver more personalised instruction to students who may have difficulties. In this sense, AI is a means to support human relations by promoting connection (such as identifying students with difficulties or dyslexia, or detecting bullying) and empathy in learning environments. Carles Sierra provided a typical example: using AI can also be a way to overcome shyness or shame. Since AI is not sentient, it lacks empathy and morality, allowing students to dispel their doubts with these tools freely.

Furthermore, the role AI can play in improving students' agency and autonomy should not be disregarded. Carles Sierra refers to a study developed in Spain recently that focused on how students were using ChatGPT. According to this study, 30% of them used it solely to complete their work, whereas 60% would use ChatGPT to find the structure of the paper they needed to write. To enhance students' agency in this context, educators should teach students to use these tools and enable them to make their own decisions with intentionality and complete control. On a personal level, Carles Sierra admitted to having started by automating lesson plans, then moving on to other activities, including peer evaluation, classes, team building, collaborative learning, and assigning responsibilities to team members.

The same position was shared by Filipe Portela, who declared that, to support him in assessing large numbers of students, he created an algorithm to mark, for example, the creation of code. He offered another example: a student who is bored by their history teacher decides to upload their presentations and asks AI to pretend to be their teacher and answer as many questions as needed. Despite these seeming advantages, rules must be established to prevent AI from controlling students and educators alike.

Filipe Portela also stated that education will become much more interesting once this technological barrier is broken and educators and students are comfortable with the knowledge of these tools, with what they are doing, and with acknowledging their limitations and impact. At this point, we can begin exploring ways to make learning more engaging.

Notwithstanding this optimistic perspective, Carles Sierra drew attention to the need for guidelines. He mentions UNESCO, which has created several frameworks to guide the acquisition of digital competences. Other institutions have recently developed guidelines for the use of AI in educational settings, including universities and education departments of various governments. This expert also highlighted the key requirement for evidence and data collection to support students and educators' decisions of which tools to use and how to use them.

However, at the political level, Carles Sierra believes progress in this area is slower than the speed of technological innovation, which inevitably involves profit. To seek a balance between corporate companies and governments, as well as their respective education departments, he suggested two approaches: either governments provide funding to schools, allowing them to purchase licenses from these large corporations and enabling students to access all these tools, or governments sponsor universities to create public adaptive learning tools. This expert favours the latter approach.

As concluding remarks, Agnė Paulauskaitė-Tarasevičienė stated that technology is neither inherently good nor bad; it is simply technology, and thus, everything is dependent on humans. She also questioned why AI is needed in education and whether it is actually required. Ultimately, she considers the use of AI in education to be a trend, a fashionable approach, or what she calls FOMO—the fear of missing out—and argues that we need to ask very different questions. Currently, what is being used is a part of AI, which is a much larger technology. Teachers and students alike are passively consuming these chatbots. Instead, they should engage in face-to-face conversations to boost students' creativity and critical thinking. In a nutshell, to enhance student agency and autonomy, it is crucial

to equip them with tools that enable them to make informed decisions rather than blindly following AI suggestions. By teaching students how to use these tools, we can also improve their motivation and mastery of their respective scientific areas.

5. Ethical awareness

Concerning ethical awareness, the moderator asked the experts to address the ethical implications involved in the use of IA, focusing on where the data that make up these large language models originated and the impact on copyright, the environment, and the labour market in different parts of the world.

Filipe Portela believes that the creative areas are the most endangered by this technology. AI can write a poem in 5 seconds or create an image in 10 seconds and this poses the issue of how to deal with the underlying human value of the arts. Since generative AI produces content based on existing data, this is a complex and challenging topic. He suggested creating a watermark to be included in AI output that would be impossible to change. However, there are also AI tools that remove these watermarks. Thus, the conundrum lies in the fact that we create tools to solve problems and then come up with others that raise even more difficulties. The key point is to develop students' AI literacy and establish rules to prevent people from using AI too freely. Carles Sierra resumed the idea that education is all about creating responsible citizens. Therefore, as citizens, we should reflect on our actions and decisions at all times, regardless of whether AI is involved or not. This is why he suggested teaching students to use AI responsibly, discussing the problems inherent in using AI, and developing AI literacy. However, where is the line to be drawn? Moreover, this is intertwined with accountability: who is to be held responsible for a particular decision?

Filipe Portela further questioned accountability and responsibility, holding that responsibility lies with humans. AI is a human creation, and companies commercialise software that humans manage and operate. He also pointed out that the roles of students, professors, and universities must not be overlooked: tools are available, and students use them. Teachers are aware of this, but if they are AI illiterate, they might not be able to help students as expected.

Agnė Paulauskaitė-Taraševičienė questioned the meaning of responsibility or accountability. All the experts agreed on the concept of human responsibility, encompassing the responsibilities of students, teachers, IT teams, and managers, but what does this mean? Companies may face penalties, possibly up to 5,000 €, which are insignificant for large corporations that generate millions.

Carles Sierra also touched upon the connection between ethics and law. For him, ethics precedes law and a law stems from an unethical position in society. Therefore, we need to be prepared to discuss ethics and ethical implications of AI, even without yet having a law that focuses on AI. An excellent topic to discuss with students is copyright, including what authorship, originality and creativity mean, and how their choices when using AI can impact copyright.

This expert continued to highlight two issues. Firstly, he believes that developers must prioritise explainability and inclusiveness, so that everyone can use the tool, as well as environmental sustainability, ensuring that their tools do not harm the environment. Secondly, governments and educational institutions must ensure that responsibility encompasses the whole ecosystem, which means, for instance, conducting ethical audits of the companies.

To sum up, educators play a crucial role in alerting students to the ethical implications of AI use. Governments and universities are also responsible for overseeing the use and development of AI, for example, through laws and guidelines, as well as auditing corporations involved in AI research.

6. Conclusion

The discussion among the experts highlighted that AI will inevitably change society and the development of AI literacy is fundamental for both educators and students. Educators themselves

must be critical users and teach students to critically evaluate the tool and their own use of AI, thereby aiding the development of an ethical perspective. The adoption of AI in education should never become a matter of following a trend or a fashion.

Although AI is not a silver bullet for all educational challenges, it could become a powerful tool when used with critical awareness and could positively transform teaching and learning. The key is to recognise AI's limitations and the irreplaceable role of human supervision and decision-making, especially in high-risk areas.

Cláudia Martins concluded the round table by thanking all participants and the experts "for their wonderful contributions,"emphasising that the debate generated "much food for thought for the next days, weeks, months". The successful integration of AI in education requires both teachers and students to understand and utilise these tools consciously and intentionally, thereby increasing student autonomy and agency.

References

European Union. (2024). *Regulation 1689 – Artificial Intelligence Act*. European Parliament and Council of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401689