



EYE•TEACH

Early Research Outcomes On Integrating **AI-SUPPORTED EYE-TRACKING** Technologies In **EDUCATION**

POLICY BRIEF

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Table of Contents

1. Introduction	3
2. Policy Context	4
3. Key Policy-Relevant Research Findings and Contributions to the State of the Art.....	7
4. Policy Implications and Recommendations.....	8
5. Conclusion: EYE Teach’s Transformation and Innovation Potential	11
6. References.....	12

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1. Introduction

The EYE-TEACH EU-funded project (2025-2028) is studying and developing a prototype **AI-assisted Eye-Tracking** tool that will help teachers to better assess their students' reading comprehension, utilising a co-creation approach with teachers.

Having just completed the first year of project implementation, which focused on research exploration, EYE-TEACH is now in the early stages of testing and development. The project will end in December 2027.

What if educators were given the ability to understand in real-time how their students are learning and engaging with what they are reading? Such an ability would go beyond the traditional assessments of testing, classroom observation and verbal feedback **after** a student reads a text. It would deliver **instant** data-driven insights and recommendations to educators, based on the subtle processes that determine students' reading comprehension, observed at classroom and individual level. How would Europe's educational landscape change, and what can be done to safely foster this change?

In an era where digital technologies and AI are revolutionising the way we work, and simultaneously being assessed for their ethical ramifications, the deployment of AI in Education (AIED) and Education Technologies (EdTech) is a lightning rod for discussion amongst educators, innovators, policymakers and the general public.

In this context, the EYE-TEACH project asks one key question:

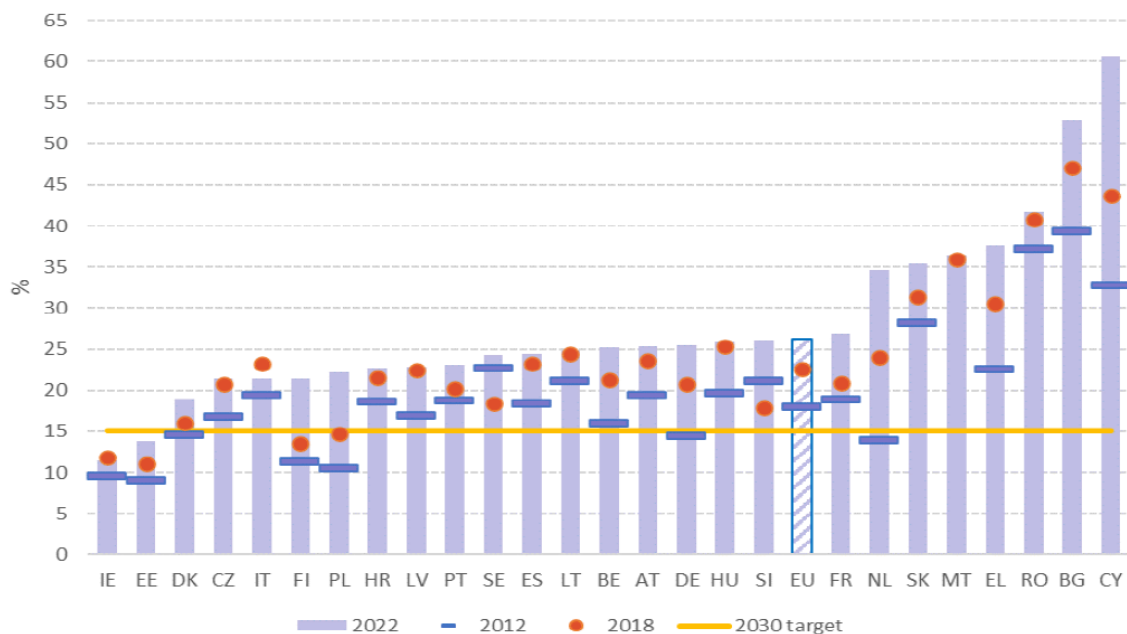
How can AI-assisted eye-tracking data be used to effectively empower teachers and tackle the growing crisis in reading comprehension across Europe?

This Brief, being written at the one-year mark of the EYE-TEACH project, outlines the context that EYE-TEACH is operating within, whilst identifying some **early recommendations for how policymakers can foster a legal and policy educational framework that embraces AIED and EdTech, in an effective, efficient, and ethical manner.**

2. Policy Context

The Policy Issue: Sharp, Europe-Wide Decline in Educational Performance

Education assessments such as PIRLS and PISA, and the Commission’s The Education and Training Monitor, show “a clear worsening in performance” in students’ reading over the last decade (European Commission, 2024), with the decline in basic skills being termed as the “ticking bomb in our education systems, and for Europe’s competitiveness” (European Commission, 2025a).



Notes: Caution is required when interpreting 2022 data for Denmark, Ireland, Latvia and the Netherlands because one or more PISA sampling standards were not met (see OECD, 2023a, Annexes A2 and A4). 2012 data is not available for Malta.

Source: OECD, 2023a (Table I.B1.5.2).

Figure 1: Bar chart representing the underachievement rate in reading in the EU (Source: European Commission, 2024)

The situation is getting worse, rather than improving. Compounding crises and structural issues are both cause and effect; net learning losses of COVID-19 introduced additional hurdles for students, teachers, and education professionals, as well as widened existing learning gaps between students; digital distractions; the negative impact of over-reliance on generative AI on cognitive skills; Europe-wide teacher shortages; increased pressures on teachers’ skill requirements, working conditions, and efficacy; and waning parental involvement to name just a few.

This significant decline in basic skills has profound implications for the future of European society, and its prosperity and resilience at large.

The EU's Policy Response: Current Framework and Future Developments

Under the overarching policy priority of ensuring Europe's sustainable prosperity and competitiveness, the **EU Union of Skills** aims to support the development of quality, inclusive and adaptable education. Under its pillar '**Building skills for life through a solid educational foundation**', the Commission has established the 2030 target that

“

the share of **underachievement**

in literacy, mathematics, science
and digital skills **should be**

<15%

and the share of **top performance**

in literacy, mathematics, science
and digital skills **should be**

≥15%

”

An update to the **2021–2027 Digital Education Action Plan** is further expected as part of this overarching strategy. The upcoming 2030 *Roadmap on the future of digital education and skills* and *AI in education and training initiative* are expected to foster a robust EU digital education ecosystem that relies on **empowered EU-based and EU-developed EdTechs and the integration of AI in education and training provision**. The (also upcoming) *EU Teachers and Trainers Agenda* is expected to help Member States tackle teaching shortages, and improve teachers' working conditions and career prospects.

Simultaneously, the EU has developed a comprehensive regulatory framework to ensure that digital innovation remains aligned with fundamental European values. The **General Data Protection Regulation** provides the legal foundation for processing personal data within the Union, establishing requirements for transparency, lawful processing and the protection of data subjects, including specific safeguards for children's data. More recently, the **EU Artificial Intelligence Act** introduced a risk-based approach to regulating AI systems. In educational contexts, AI systems that monitor behaviour or support decision-making processes may fall within higher-risk categories and therefore require strong governance measures, including human oversight and transparency. The upcoming *Digital Omnibus Package* is further expected to respond to the tensions caused by increasing regulatory complexity and fragmentation.

How EYE-TEACH contributes to policy priorities

EYE-TEACH was funded under **HORIZON-CL2-2024-TRANSFORMATIONS-01-11**, a call seeking to understand, develop, and deploy new technologies that complement human job skills, and support the workforce in using them.

In this call and policy context, EYE-TEACH will develop a pilot **AI-assisted eye-tracking EdTech, aiming to empower educators with more in-depth knowledge about their students' differential learning processes.**

Eye tracking is a sophisticated methodology which captures where and when a person looks with high precision, and the possibility of using these eye movements to predict performance on reading comprehension tasks is an extensively researched topic. Eye-tracking data can serve as a proxy of engagement and understanding, providing crucial insights into students' learning processes for teachers.

However, granular, raw eye-tracking data is difficult to understand for non-specialists, and that is where EYE-TEACH's integration of AI offers promising innovative breakthroughs. Advanced AI algorithms can quickly assess and convert this wealth of data into actionable insights into each students' reading patterns, engagement and comprehension for teachers. This technology bridges the gap between technology and pedagogy, enabling teachers to tailor instruction in real-time to meet diverse learning needs, better support basic skill learning, and reduce the heavy workload imposed by more traditional teaching approaches.

The Research Challenges

One key challenge to this goal is the limited number of datasets available. Large-scale, accessible, well-documented, and high-quality eye-tracking datasets spanning diverse languages, populations, text genres and reading interactions are required to draw analysis and develop more advanced Machine Learning models that can decode rich cognitive signals from eye-tracking data during the reading process.

A further foundational challenge is that the processing of minors' biometric data through AI-based profiling systems presents a complex landscape from a data protection perspective. EYE-TEACH's research requires rigorous application of the principles of ethics and privacy by design, algorithmic transparency, and informed consent. As a result, the project employs a robust and continuous ethical review process that underpins the entire research structure. Moreover, the project is closely monitoring the fluctuation of the wider legal framework in which it operates, as potential updates are expected to both the AI Act and the GDPR via the Digital Omnibus.

3. Key Policy-Relevant Research Findings and Contributions to the State of the Art

EYE-TEACH is already conclusively pushing European knowledge and datasets linking eye movements to text comprehension, emotions and cognition, and applying it to the educational context.

1

We have implemented the first ever international mapping of European teachers' needs, technology acceptance and readiness for using AI-assisted ET-analytics tools. Existing research has focused predominantly on students; EYE-TEACH has comprehensively gathered insights from educators which is informing the development process. Our results show that teachers are not opposed to AI-supported educational technology, but their openness is clearly conditional on a number of factors that need to be integrated within development. The findings have implications for broader EdTech and AIED in general: **teachers want a broader vision of AI in education in which innovation is guided not by automation alone, but by human-centered design, pedagogical relevance, and responsible ethical implementation.**

2

EYE-TEACH is developing the **first clear ethical and legal guidelines for research and development of AI-assisted ET-analytics systems for education**, in response to the currently limited understanding of the ethical and legal boundary conditions surrounding such technologies.

3

Our work outlines **key requirements for AI-based solutions that translate eye-movement data into actionable insights** to support teachers in diagnosing reading difficulties. It identifies relevant eye-movement metrics and suitable public datasets to support development and validation. The analysis considers both low-cost, scalable approaches (e.g., webcam-based systems for everyday classroom use) and high-precision eye-tracking technologies. Finally, it defines human-centred AI requirements alongside ethical and legal considerations, emphasising transparency, explainability, and the preservation of human autonomy.

4. Policy Implications and Recommendations

The following policy recommendations are based on results from multiple literature scoping reviews, initial exploratory workshops with teachers, and an international hybrid-intelligence teacher questionnaire and vignette study.

The experiences gathered through the EYE-TEACH project illustrate the broader policy challenges associated with introducing AIED and EdTech into educational environments. While such technologies offer considerable opportunities to support learning and improve educational outcomes, their successful adoption requires careful attention to **governance**, **capacity building** and **ethical considerations**.

Policy Recommendations

1

Prioritise teachers' agency and autonomy with Human-Centred AI in Education

EYE-TEACH findings so far highlight conclusively that behavioural data-driven AI tools are most effective when designed as hybrid-intelligence systems, where **AI supports, rather than substitutes, teacher expertise**. Teachers must remain essential for interpreting data, contextualising student behaviour, and maintaining rich learning interactions that are not overly reliant on automation and screen-only learning activities.

Policy frameworks should therefore prioritise teacher-in-the-loop AIED design. EU funding and procurement criteria for AIED and learning-analytics projects should explicitly mandate that AI augments rather than replaces teachers, with researchers and suppliers being required to ground their work in explicit pedagogical, socio-technical, and ethics-oriented frameworks. Structured and iterative stakeholder co-design with teachers (and where appropriate, students and parents) should also be incentivized and prioritised in funding decisions.

In parallel, the **EU should move to address the remaining knowledge and implementation gaps** by funding longitudinal, mixed-methods, and multi-

country studies on hybrid AIED, rather than short-term pilots. This would allow for the impact of AIED to be tracked in the medium-term, making it possible to make informed interventions.

National (digital) education strategies and regulations should seek to embed hybrid-intelligence principles, as well as establish (or update) legislative criteria for AI-assisted EdTech tools using behavioural student data to **require explainable dashboards and recommendations, evidence of teacher co-design, and pedagogical fit**. Hybrid-intelligence architectures should become a standard expectation in the development of AI-supported learning technologies.

At the same time, **teacher autonomy and teacher-student interaction and peer discussion must be protected**. Strategic and legal guidance should be provided to schools and educators to ensure that reading instruction remains interaction-rich and combines digital and print materials, whilst limiting complete reliance on solitary, screen-only activities. Schools should be supported to ensure their policies safeguard time for discussion, group work, and teacher-led strategy instruction, setting limits for extended periods alone with the tools at hand.

2

Teacher capacity and school infrastructure is required for the effective use of AIED technologies

AIED tools cannot deliver value without the institutional conditions that allow teachers to use them effectively. Evidence from EYE-TEACH shows that adoption depends heavily on teachers' ability to interpret dashboards, understand tools' limits, and integrate insights into pedagogical practice.

For the full uptake of behavioural-based EdTech tools, EU and national funding should continue to further be channeled towards **systematic educator professional development on AIED**. Teacher professional development frameworks should be expanded to include training in data interpretation, AI literacy, the ethical use of behavioural data, and on the practical use of EdTech as the new frontier of digital tools. Teachers will have to understand how these tools and models work and what their limits are, how to interpret dashboards and alerts, and how to use them ethically.

In parallel, **EU and national funding must be dedicated for infrastructure and hybrid intelligence EdTech deployment**, such as for investment in devices, connectivity, and integration with national platforms, as well as to finance dedicated pedagogical technology-support roles in schools. Support and funding programmes should ensure that school-level conditions (such as ICT and legal policies, optimised teacher workload, and support structures) are adapted to enable full uptake. Without this, even well-designed tools will be

underused or misapplied.

Schools could also be encouraged and supported to establish targeted professional development and peer learning around concrete EdTech tools.

School- or network-level communities of practice could focus around utilising specific dashboards or eye-tracking tools, jointly interpreting student data, discussing appropriate interventions, and addressing ethical concerns.

3

Behavioural learning data in EdTech must be used responsibly, and primarily for formative support

AIED and eye-tracking technology generates rich behavioural and biometric data about how students engage with learning tasks. This data holds significant potential for early diagnosis, personalised feedback, and improved reading instruction. However, stakeholder take-up is hampered due to widespread uncertainty about how to navigate legislative complexities, slowing innovation.

At **EU level, specific standards should be set on transparency, explainability, and data governance for behavioural data-driven AIED and EdTech**, thus ensuring clear guidelines are available that align educational use of AI within EdTech with the AI Act and GDPR. Such frameworks should require high standards for explainability of system outputs, clear purposes, and limits for data use, and child-appropriate privacy protections.

Legislative frameworks should mandate or promote formative uses of AI-supported process data, primarily for the use in diagnosis, monitoring, and formative feedback in reading and other domains, rather than for high-stakes grading or accountability.

Schools must also be supported via legislative frameworks and funding support to establish local data governance and communication practices, clearly specifying how behavioural data are collected, stored, accessed, and communicated to students and parents.

5. Conclusion: EYE-TEACH's Transformation and Innovation Potential

Within the context outlined, EYE-TEACH has bold goals with substantive implications for the European educational landscape.

On a scientific level, EYE-TEACH deepens the understanding of these technologies and their use in education, mapping the real needs and barriers of educators in implementing eye-tracking and AI-based educational systems and current use of data in educational practice. We are concretely outlining the ethical and legal considerations in implementation and use of this technology, and will further produce public eye-movement metrics and datasets that can be used to pilot similar technologies in education. Crucially, our stakeholder-first co-design approach ensures that a human-centred approach is embedded at all levels.

On the social dimension, EYE-TEACH will contribute towards empowering European teachers with training and open access materials to adopt and ethically use advanced AI-assisted eye-tracking analytical tools, and push for the development of new policies at EU, national, local, and school level that allow for these changes.

The EYE-TEACH prototype tool will enable teachers to assess student's comprehension during a reading task (rather than traditional methods which assess comprehension after), whilst also providing insights into students' cognitive processes and engagement as they read. These insights will be unlocked at the group level, for non-specialised teachers. Current eye-tracking systems only offer information individually for each reader, and require detailed specialist knowledge on eye tracking technology to interpret and action. The EYE-TEACH pilot system will interpret students' eye-movement patterns in an accessible language that can be understood and used by teachers, and scaled to different education levels. This would reduce teachers' workload, improve student performance, increase reading comprehension, and help close learning gaps.

Lastly, on a technological and economic level, the EYE-TEACH solution has immense potential for future development, such as through a successor project or spin-off market entity. The open access materials of the project can also catalyse other commercial solutions using eye-tracking and AI to support educators and assess reading comprehension. In doing so, EYE-TEACH and its technology can improve job conditions for teachers, whilst creating jobs in the burgeoning EdTech space.

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