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Mustafa Canlı

***The Director General of Innovation and Educational Technologies,
Ministry of National Education***

Dr. Zafer Özen

National Education Expert, Ministry of National Education

Dr. Hüseyin Ulukuz

National Education Expert, Ministry of National Education

Dr. Emre Dinç

National Education Expert, Ministry of National Education

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Ministry of National Education*

Dr. Emre Dinç

*National Education Expert,
Ministry of National Education*

Abstract

As Artificial Intelligence (AI) rapidly reshapes the global educational landscape, this chapter examines the comprehensive, human-centered strategy adopted by Türkiye's Ministry of National Education to integrate AI into the national school education system. Anchored in the "Century of Türkiye Education Model," the study details national progress across seven critical domains: establishing a robust governance framework and action plan; expanding digital infrastructure and inclusion; reforming curricula for AI literacy; deploying AI tools; developing platforms for personalized learning (MEBİ) and language acquisition (DİLİM); supporting accessibility for learners with special needs; and implementing rigorous ethical safeguards. By prioritizing a human-centered AI philosophy, Türkiye demonstrates a balanced model of digital transformation that leverages advanced technologies to bridge achievement gaps and modernize instruction without compromising the fundamental role of the teacher or the dignity of the learner, offering valuable insights for policymakers and teachers as they navigate the future of educational AI.

Keywords

*Artificial Intelligence in Education, Educational Policy, Human-Centered AI, AI Ethics,
Personalized Learning*

Introduction

Artificial Intelligence (AI) is rapidly reshaping education systems worldwide, generating optimism about improved teaching quality, personalized learning, and administrative efficiency, while simultaneously raising concerns about data privacy and security. The debate is no longer about *whether* AI will transform education, but rather *how* policymakers, institutions, educators, and other stakeholders (e.g., parents) can guide this transformation in ways that uphold human values and ethics, promote fairness, and strengthen educational quality.

In contemporary education, AI is not limited to generative tools or administrative analytics. It also includes intelligent tutoring systems (ITS), which provide adaptive feedback and personalized guidance based on learner performance, as well as immersive virtual reality (VR) and augmented reality (AR) environments that can support simulation-based, interactive, and experiential learning. Recent literature suggests that integrating ITS with AR/VR environments can strengthen personalization, feedback, and learner engagement, especially in complex or practice-based learning contexts (Kerimbayev et al., 2025; Ramadhani Fajri et al., 2025; Tassilova et al., 2025; Vincent-Lancrin & van der Vlies, 2020).

Türkiye's Ministry of National Education (MoNE) approaches this challenge as both a technological transition and a human-centered pedagogical shift. Anchored in the Century of Türkiye Education Model (MoNE, 2024), the Ministry views AI as a strategic tool for advancing educational quality while safeguarding inclusion, equity, and national values. This vision manifests through a comprehensive policy framework, curriculum reforms, next-generation digital learning platforms, and teacher support mechanisms, all underpinned by robust ethical principles.

Türkiye adopts a human-centered and sustainable approach to AI, viewing technology as an instrument that augments human capabilities rather than supplanting teachers or diminishing human agency. Aligning with international frameworks, including the OECD AI Principles (OECD, 2019, 2024a), the UNESCO's 2023 Guidance for Generative AI in Education and Research (Miao & Holmes, 2023), and the emerging regulatory standards shaped by the EU AI Act (European Parliament & Council of the European Union, 2024), Türkiye emphasizes that AI systems in education must respect fundamental rights, ensure fairness, and preserve cultural and linguistic diversity (MoNE, 2025a, 2025b).

This chapter provides a comprehensive overview of Türkiye's integration of AI in education. It examines national progress and practices across seven major domains: (1) Governance and policy framework for AI in education; (2) Infrastructures and digital inclusion; (3) AI-integrated curriculum reform and capacity building; (4) Empowering educators with AI tools and assistants; (5) AI-enhanced educational

platforms and projects; (6) AI applications supporting accessibility and learners with special needs; (7) Ethical considerations and safeguards. Within this broader landscape, MoNE has also developed or supported several flagship systems and platforms, including MEBİ, an AI-supported personalized learning platform with the virtual assistant KANKA; DİLİM, a personalized language-learning platform offering age- and level-based content in English and Turkish; and the Students' Vocabulary Project, whose corpus data are intended to support digital learning materials, Turkish-language applications, and skills-based assessment systems (Directorate General of Secondary Education, 2024; MoNE, 2025a).

Throughout the chapter, we highlight Türkiye's pedagogy-aligned and ethically grounded approach to educational AI. Türkiye actively engages with organizations (e.g., the World Bank, OECD, UNESCO, and the Council of Europe) to exchange knowledge, align with global best practices, and contribute to international policy development. Ultimately, the aim is to inform policymakers, education leaders, researchers, teachers, and learners regarding Türkiye's navigation of the opportunities and challenges of AI to transform its education system in a principled, future-oriented manner. This chapter focuses on the school education system under the MoNE and does not address higher education.

1. Governance and Policy Framework for AI in Education

A robust governance and policy architecture forms the foundation of Türkiye's integration of AI in education. MoNE has established clear national policies, regulatory mechanisms, and coordinating structures to guide the responsible adoption of AI across the education ecosystem. In June 2025, MoNE released the Artificial Intelligence in Education Policy Document and Action Plan for 2025-2029 (MoNE, 2025a), a landmark strategic framework that sets out concrete objectives, timelines, and implementation responsibilities for all education stakeholders. This action plan defines how AI should be harnessed to enhance learning outcomes, support teachers, improve administrative processes, and strengthen educational equity, while simultaneously protecting core educational values. It is also aligned with Türkiye's national AI Strategy for 2021-2025 (MoNE, 2021b), ensuring coherence between national digital policy and the education sector's AI priorities, such as developing AI literacy, stimulating local EdTech innovation, and upgrading educational infrastructures. By articulating a unified vision, the Action Plan ensures that diverse AI initiatives, from digital content platforms to educational management systems, advance in coordinated and mutually reinforcing ways. For curriculum developers, provincial education directorates, teachers, and technology providers, the Plan serves as a roadmap guiding all AI-related projects.

To ensure ethical and effective implementation, MoNE established an AI Ethics Committee for Education. This committee comprises experts in educational technology, data privacy, ethics, and law, and is tasked with evaluating and monitoring AI tools before, during, and after deployment in schools. The committee reviews adaptive learning systems, student analytics tools, and assessment algorithms to ensure they abide by the principles of privacy, transparency, fairness, and human oversight. Complementing this structure, the Ministry released an AI Ethics Guidance Booklet (MoNE, 2025b), which was shared with teachers, administrators, students, parents, developers, and EdTech developers. The guide operationalizes high-level ethical principles into actionable practices, such as advising teachers on informed consent procedures for student data, strategies for identifying and mitigating algorithmic bias, and ensuring that human judgment remains central in the AI-supported decision-making process. Through these institutional safeguards, Türkiye seeks to proactively prevent potential harm and foster a culture of responsible innovation within its education system. These efforts resonate with the international frameworks, as an OECD member, Türkiye aligns with the OECD AI Principles, which emphasize human rights, fairness, transparency, and accountability (Vincent-Lancrin & Vlies, 2020). Likewise, the ethical priorities of the Council of Europe, particularly regarding human dignity in AI governance (Council of Europe, 2024), align with MoNE's approach.

Türkiye's governance strategy on AI also extends beyond national borders through active participation in the global policy landscape of AI in education. Through consistent collaboration with UNESCO, the OECD, and the Council of Europe, MoNE fosters a two-way exchange of knowledge, both contributing to and leveraging international best practices. For example, Türkiye participates in discussions within the OECD Education 2030 project on AI competencies for learners, offering insights grounded in its curriculum reforms. Turkish education experts have contributed to the development of OECD guidance documents on AI literacy, ensuring that global standards reflect perspectives from the Turkish education system. Similarly, Türkiye collaborates with UNESCO through platforms such as the Emerging Technologies Working Group, aligning national strategies with UNESCO's human-centered AI principles that emphasize social justice and human dignity (UNESCO, 2022). Türkiye also follows ongoing development in the Council of Europe's AI ethics initiatives (e.g., Council of Europe, 2024), including its emerging Convention on AI, to maintain consistency between national education policies and broader human-rights-centered governance approaches. These engagements strengthen Türkiye's position as a forward-looking contributor to global AI-in-education policy and ensure that domestic frameworks are benchmarked against international practices.

Türkiye's governance architecture for AI in education is deliberately multi-layered. It integrates a clear national strategy, detailed action plans, institutional ethical oversight mechanisms, and active participation in global policy forums. This comprehensive and interwoven framework provides strong assurance that the integration of AI into Turkish education is being pursued with rigor, responsibility, and alignment with both national priorities and universal principles.

2. Infrastructure and Digital Inclusion

A central pillar of Türkiye's AI-in-education strategy is the development of robust digital infrastructure paired with a commitment to equitable access. Without reliable hardware, high-speed connectivity, and inclusive design principles, even the most advanced AI applications would fail to provide access for learners and teachers. Building on more than a decade of nationwide digital transformation efforts, MoNE has created an enabling environment for the country-wide adoption of AI-powered tools. From major metropolitan areas to remote villages, ongoing investments aim to close the digital divide and ensure that all learners can access and benefit from emerging AI-supported educational opportunities.

2.1. Smart Classrooms and Connectivity

Over the last decade, Türkiye has made substantial progress in modernizing school infrastructure through large-scale initiatives such as the FATİH Project (Movement to Enhance Opportunities and Technology). This initiative has equipped tens of thousands of schools with interactive smart boards, high-speed internet access, and classroom computers and tablets. These smart boards, large touchscreen panels with internet connectivity, serve as critical gateways for AI integration in the classroom. Although the FATİH Project was not originally designed as an AI initiative, it created the nationwide digital infrastructure, interactive boards, internet connectivity, and classroom devices on which AI-supported platforms and applications could later be deployed at scale.

Teachers can access AI-driven platforms (e.g., MEBİ or DİLİM), tailor content for different student groups in real time, or connect with the AI Teaching Assistant FEYZA to support instruction. Details of the aforementioned platforms and tools (MEBİ, DİLİM, FEYZA) will be provided in the following chapters.

In this context, virtual classrooms are digitally connected learning environments that enable teachers and students to participate in lessons, access shared content, communicate, and complete learning activities via online platforms, thereby complementing the physical classroom and supporting remote or blended learning.

By 2025, digital classroom infrastructure in Türkiye had reached a scale that enabled the widespread deployment of AI-supported educational tools, with interactive boards and internet connectivity already in place across the vast majority of state-

school classrooms. This ubiquitous hardware foundation is essential for the scalable deployment of AI tools: a rural primary school with a connected smart board can access the same AI-powered educational resources as an urban school. This parity is a deliberate outcome of MoNE's long-term infrastructure strategy. Connectivity upgrades remain an ongoing priority. MoNE continues to expand broadband coverage across Türkiye and is exploring satellite or mobile connectivity solutions.

These efforts align closely with UNESCO's recommendation (Miao & Holmes, 2021) that universal digital access and connectivity form the backbone of any AI-in-education strategy. Thanks to the extensive groundwork laid by initiatives, such as FATİH, Türkiye is well-positioned to take the next giant leap toward AI-supported, equitable, and future-ready education.

2.2. National MOOC and E-learning Platforms

Inclusivity in education also requires reaching learners beyond the traditional classroom, including those who need additional academic support. To this end, Türkiye has developed large-scale digital learning platforms that operate on a Massive Open Online Course (MOOC) model and are tailored to national curricula and educational priorities. The most prominent of these platforms is EBA (Education Informatics Network). Although EBA predates the recent wave of AI innovations, it has been progressively enhanced with AI-driven capabilities. It offers thousands of lessons, instructional videos, interactive activities, and assessments across grade levels. EBA became the primary remote learning environment for millions of students during the COVID-19 pandemic.

Building on EBA's extensive user base and infrastructure, MoNE is integrating AI-powered recommendation systems that function similarly to personalized content suggestions on commercial streaming services. These systems identify students' learning profiles, such as previously viewed materials, demonstrated misconceptions, and areas of interest, and recommend targeted content accordingly. For example, a student struggling with a specific mathematics concept may be directed to instructional videos, scaffolded exercises, step-by-step worked examples, and educational games aligned with that learner's readiness level. In this way, the platform supports more customized teaching by adapting the type, sequence, and level of content to the student's demonstrated needs, allowing learners to progress at their own pace while helping teachers identify where additional support may be needed. In this way, EBA is evolving from a digital content repository into an adaptive and learner-centered environment.

In addition to EBA, MoNE recently introduced ÖBA (Teacher Professional Development Platform), its national MOOC platform. ÖBA supports teachers' professional learning through structured digital courses and AI-related training opportunities. Recent offerings on the platform include courses such as Artificial

Intelligence in Education, Artificial Intelligence Applications, and Artificial Intelligence for Schools, indicating that MoNE is increasingly integrating AI-focused professional development into its national teacher-learning ecosystem. By providing structured yet adaptive professional learning, ÖBA empowers teachers to build their digital and pedagogical competencies, which are essential in an era of rapidly evolving AI technologies.

Together, EBA and ÖBA embody Türkiye's commitment to lifelong learning and align with the broader objectives of Sustainable Development Goal 4 (SDG 4: Quality Education; United Nations Department of Economic and Social Affairs, n.d.). Both platforms are accessible nationwide at no cost, reducing barriers to high-quality learning materials for students and teachers alike. Critically, all content on these platforms is developed or curated by MoNE to ensure coherence with national curricula and educational values. The integration of a human-centered AI approach enhances, not disrupts, this alignment by supporting individualized learning while maintaining curricular integrity.

2.3. Multilingual and Inclusive Design

Türkiye's education system serves a highly diverse student population, including linguistic minorities, migrant communities, and a significant number of refugee students, many of whom speak languages other than Turkish. Ensuring that AI-supported education does not exclude non-Turkish-speaking learners or students with special needs is therefore a central priority. The DİLİM language-learning platform already supports multilingual access, and MoNE's broader AI policy framework indicates continued expansion of personalized, accessibility-oriented digital language-learning tools. Also, within EBA, for example, a physics lesson originally developed in Turkish can be automatically translated into other languages using AI translation engines, enabling non-Turkish-speaking students to access core curricular content. Similarly, AI-driven subtitling and sign-language avatars are being piloted for video lessons to assist students with hearing impairments. These initiatives reflect both national commitments and international guidance, including UNESCO's emphasis on cultural and linguistic diversity in AI-supported education (Miao et al., 2021).

Digital inclusion also encompasses gender and socio-economic equity. MoNE is developing data- and analytics-based monitoring capacity to better understand platform use and student learning processes. For example, official documents indicate efforts to support the collection and monitoring of EBA user data by gender and socio-economic characteristics through integration with MoNE's existing education management information systems (MoNE, 2021a, 2025a). Such monitoring can help identify participation gaps and inform targeted interventions, including awareness programs, teacher-support initiatives, and more context-responsive content design. Schools in socio-economically disadvantaged areas receive priority for infrastructure

upgrades, device distribution, and AI-focused teacher training to prevent the emergence of new digital divides. Additionally, parent engagement programs and public information campaigns help build community trust in AI technologies and address misconceptions about digital learning tools.

In practice, Türkiye aims to ensure that AI in education serves as a public good rather than a privilege reserved for a select group. This requires ongoing investments in connectivity, electricity, device availability, multilingual design, accessibility features, and policies. Through its focus on equality and inclusion, Türkiye addresses a common global concern that AI and digital technologies may widen existing disparities between the “haves” and the “have-nots.” Instead, Türkiye’s synchronized strategy demonstrates how AI can narrow these gaps when integrated into a thoughtfully designed and universally accessible education system. When students have access to AI -supported tutors and assistants such as MEBİ’s KANKA, interactive lesson materials, and adaptive digital platforms that respond to learning traces, the potential of AI to enhance equity becomes more tangible (Directorate General of Secondary Education, 2024; MoNE, 2025a). As UNESCO’s guidance (UNESCO, 2022) underscores, effective national AI strategies must be closely aligned with broader investments in infrastructure and capacity building. Türkiye’s coordinated approach exemplifies this principle, creating an educational landscape in which AI applications are not isolated technological experiments but natural extensions of an inclusive, well-prepared digital ecosystem.

3. AI-integrated Curriculum Reform and Capacity Building

Recognizing that an AI-driven future requires new forms of knowledge, pedagogical adaptation, and institutional readiness, Türkiye has begun to embed AI within curriculum reform rather than treating it merely as an external technological trend. In this respect, the MoNE frames AI not only as a subject of instruction but also as a cross-cutting component of digital transformation in schooling. MoNE’s *Artificial Intelligence in Education Policy Document and Action Plan (2025–2029)* explicitly identifies the development of AI literacy, awareness-raising activities, and the enhancement of teachers’ competencies in designing AI-supported lessons as core policy priorities.

This reform agenda is visible in both policy and curriculum documents. At the level of formal curriculum design, AI is being incorporated through dedicated elective courses and through modules embedded within broader information technologies curricula. The official Artificial Intelligence Applications Course Curriculum (MoNE, 2023a) includes structured content on pattern recognition, artificial neural networks, fuzzy logic, and project development in block-based environments, indicating that students are expected not only to develop awareness of AI but also to engage with foundational concepts and applications in age-appropriate ways.

At the same time, curriculum reform is also taking place through modular course structures in secondary education. Official secondary framework documents state that within the Information Technologies and Software course (MoNE, 2023b, 2023c), students may select modules such as programming, robotics, mobile application development, and AI applications. More recent curriculum documents further show that AI applications are linked to data collection, data analysis, model validation, and coding practices, thereby positioning AI learning within a broader progression from digital literacy toward computational and analytical competence.

This direction is consistent with international guidance. UNESCO's AI Competency Framework for Students (UNESCO, 2024) argues that AI learning objectives should be integrated into official school curricula so that students can engage with AI safely, meaningfully, and responsibly. Türkiye's recent curriculum reforms reflect this broader orientation by moving AI from the margins of educational innovation toward more formal curricular recognition.

3.1. Student Curriculum Reforms

At the secondary school level, MoNE has introduced new elective courses focused on AI and related technologies. Beginning in the upper secondary grades, students can choose electives, such as "Introduction to Artificial Intelligence" or "Machine Learning Fundamentals". These courses cover core AI concepts (such as algorithms, data models, and ethical issues) in an age-appropriate manner, often with hands-on projects that let students train a simple model or build basic AI applications. In 2022, the Ministry piloted an AI and coding elective in select high schools, which proved successful and was expanded nationwide. By 2025, AI-related elective courses and modules had been formally incorporated into the secondary curriculum, including "Elective Artificial Intelligence Applications I-II" and "Elective Artificial Intelligence and Machine Learning" for grades 11 and 12 (MoNE, 2025a). Official curriculum documents show that these courses extend beyond general awareness to include neural networks, fuzzy logic, data practices, and introductory model-building activities, indicating a shift toward structured, application-oriented AI literacy in education.

In vocational and technical high schools, entire programs have been updated or newly created with an AI orientation, such as Data Science and Artificial Intelligence Technology programs for students pursuing technical careers. These vocational programs introduce machine learning techniques, data analysis, and AI software development, directly preparing skilled technicians for Türkiye's burgeoning AI industry. Such curricular additions reflect an understanding that AI literacy is becoming as essential as traditional literacy. They also align with UNESCO's guidance that AI-related topics should be integrated across subjects and not confined to computer science alone (Miao et al., 2024). Indeed, Türkiye's approach encourages interdisciplinary learning, with AI case studies appearing in subjects from economics to biology (e.g., discussing AI in finance or AI in genetic research in relevant classes).

This approach not only broadens students' understanding of AI but also equips them with the skills to apply AI concepts across various fields, fostering innovation and adaptability.

3.2. Teacher Training and In-service Learning

Alongside changes to student curricula, MoNE has identified teacher capacity-building as a central component of AI integration in education. *The Artificial Intelligence in Education Policy Document and Action Plan (2025–2029)* explicitly states that teachers' competencies in designing AI-supported lessons will be enhanced, indicating that curriculum reform is intended to be accompanied by professional development and pedagogical support for educators. Through national professional development platforms such as ÖBA, many teachers have completed short courses on topics such as Fundamentals of AI, Educational Data Analytics, and AI Ethics in the Classroom. A key focus is on practical skills, including training teachers in prompt engineering, which is the craft of effectively interacting with generative AI models. Given the rise of large language model tools (like chatbots that can produce text or code), teachers are learning how to formulate prompts to use these tools for lesson planning, generating quiz questions, or providing alternative explanations for students. This enables teachers to harness AI as a creative assistant rather than view it as a threat of replacement. Additionally, MoNE's professional development programs emphasize continuous learning: teachers are encouraged to partake in regular webinars, workshops, and communities of practice on AI integration. In 2024, the Ministry organized regional AI in Education conferences for educators, providing a forum to share experiences and pedagogical innovations.

To promote quality and coherence, MoNE's recent policy documents and guidance materials draw on international benchmarks such as UNESCO's AI Competency Framework for Teachers (Miao & Cukurova, 2024), which emphasizes a human-centered mindset, ethical use of AI, and pedagogical competencies for leveraging AI in educational settings. In parallel, MoNE's own policy framework underscores that teachers must remain accountable for their classrooms and use AI to augment rather than replace their pedagogical role (MoNE, 2025a). Practical guidance includes case studies on using AI-powered platforms for differentiated instruction, cautionary tales on algorithmic bias, and strategies for maintaining student engagement when using AI tools. By investing in teacher upskilling and clearly communicating that AI is a tool under the teacher's control, Türkiye is nurturing a teacher workforce that is not only technically proficient but also pedagogically and ethically prepared for AI.

This holistic capacity building, combining student curriculum reform with teacher training, ensures that the integration of AI into Turkish education is effective and sustainable. Students gain cutting-edge skills and knowledge, and educators are equipped to guide them, closing the loop between policy and classroom practice.

4. Empowering Educators with AI Tools and Assistants

Türkiye's human-centered AI strategy places educators at the heart of innovation. Rather than viewing AI as a replacement for teachers, the Ministry is harnessing AI to augment teachers' capabilities and reduce their workload on routine tasks. Several pilot projects and tools, including an AI teaching assistant and content-creation aids, have been introduced to empower teachers in the classroom and in their professional development. This approach aligns closely with the principle that AI should support human decision-making and creativity in education (Vincent-Lancrin & van der Vlies, 2020). By giving educators AI-driven assistants, Türkiye aims to enhance teaching quality and job satisfaction, ultimately benefiting student learning.

One notable initiative is the development of an AI Teaching Assistant, also known as *FEYZA*, a pilot program exploring the use of an AI-powered virtual assistant to help teachers with both instructional and administrative tasks. In a regular classroom context, the AI assistant (accessible via a computer or smartboard interface) can field factual questions from students, freeing the teacher to focus on more complex discussions. For example, if a student asks for the definition of a concept or the date of a historical event, the AI assistant can quickly provide the answer or a relevant tutorial snippet, allowing the lesson to continue smoothly. The program allows the teacher to remain in control; they decide when to invoke the assistant and can always override or elaborate on its responses, while the AI's presence means students can get instant support, without interrupting the flow of the lesson as the teacher looks up information. Beyond Question and Answer (Q&A) practices, the AI Teaching Assistant can also provide suggestions to the teacher, such as proposing differentiated questions for students at different levels, readiness, and interests, or flagging when it senses (through voice or written inputs) that many students are struggling with a particular concept being taught. In pilot trials at schools in Ankara, teachers reported that such an assistant helped them be more responsive to individual student needs, essentially serving as an additional resource in large classrooms. It is important to note that FEYZA is designed with a human-in-the-loop philosophy; it learns from the teacher's adjustments and feedback, which helps it become more attuned to each teacher's approach and classroom context over time.

Another tool designed to empower educators is *the Prompt Assistant*, part of MoNE's suite of AI solutions. As teachers increasingly experiment with AI content generators (e.g., to create custom exercises or illustrative examples), the Prompt Assistant crafts effective prompts and curates AI-generated material. This tool is essentially a smart coach. Suppose a teacher wants to generate a reading passage about climate change for a specific grade. The Prompt Assistant can create the prompt for the generative model, reminding the teacher to specify the reading level, include key vocabulary from the curriculum, and set the desired length. By doing so, it addresses two common issues: helping teachers achieve better results with generative AI (which can save

them time preparing materials) and ensuring the outputs are classroom-ready and trustworthy. Essentially, teachers are being trained to work with AI as creative partners, embodying the augmentation of human creativity that the OECD and UNESCO often highlight (OECD, 2025; UNESCO, n.d.). With tools like the Prompt Assistant, teachers gain confidence that adopting AI will not lead to misinformation or a mismatch with their lesson goals because the tool provides an additional safety net in real time.

Beyond classroom instruction, Türkiye is also implementing AI solutions for students. For instance, the Ministry has rolled out a *Podcast Assistant* that uses AI to help students create content with documents. Students can input topics or even books, and the assistant generates short podcasts. Students can listen to insights generated from books or lesson notes, curated by AI.

Additionally, an AI-driven *Legislation Assistant* has been introduced within MoNE to help administrators digest new regulations or policy documents. This tool quickly finds and summarizes lengthy policy texts and can answer questions about implementation details, ensuring that administrators are well-informed about the latest governance changes without wading through dense documents. While this primarily benefits the administration, it indirectly benefits teachers, students, parents, and other stakeholders by streamlining communication and improving understanding of policies within the education community.

Underlying all these efforts is our commitment to ensuring that teachers remain irreplaceable as facilitators of learning, mentors, and role models for students. The Ministry positions AI tools as a means of reducing drudgery and amplifying impact: marking quizzes, generating paperwork, and producing routine reports can be automated, freeing teachers to engage with students and develop creative lesson plans. For example, in objective assessments such as multiple-choice tests, optical reading and automated scoring tools can accelerate scoring and reporting processes (Fisteus et al., 2013; Jocovic et al., 2024; Tian et al., 2025). Far from making teachers obsolete, these innovations position teachers as AI-empowered professionals. Indeed, MoNE's internal guidelines echo that the teacher's accountability and pedagogical leadership must remain central, regardless of AI's presence (MoNE, 2025b). Such tools can also provide personalized insights, for example, by identifying topics that students find most difficult, thereby helping teachers plan remedial instruction more efficiently (OECD, 2025).

In summary, Türkiye's approach to AI in education treats teachers as key beneficiaries of the technology, not just as its deliverers. By providing teachers with AI-related guidance, emerging support tools, and pedagogically oriented digital resources, Türkiye is working to ensure that teachers can teach better and smarter, not harder. This approach safeguards human dignity and the professional value of educators, reinforcing the idea that no AI can replace the empathy, judgment, and

inspiration that a human teacher provides. Instead, AI is cast as a helpful colleague, one that can handle the heavy lifting of data crunching or content generation under the teacher's direction. As these initiatives mature, Türkiye is cultivating a model where teacher-led innovation drives AI adoption, resulting in a more supportive and effective learning environment for students.

5. AI-enhanced Educational Platforms and Projects

Türkiye has complemented its policy and curriculum initiatives by developing AI-powered educational platforms and projects designed to personalize and enrich learning. These digital platforms leverage data and machine learning to support students' individual needs, improve language acquisition, and contribute to national AI research and development in education. By building homegrown solutions such as MEBİ, DİLİM, and the Students' Vocabulary Project, the Ministry is both modernizing the learning experience and strengthening Türkiye's capacity in educational AI.

5.1. MEBİ – Personalized Learning Platform

One of MoNE's flagship AI-driven platforms is MEBİ, a personalized learning environment (The name "MEBİ" is derived from the Turkish acronym for "Ministry of Education Individual Learning," reflecting its individualized approach.) MEBİ serves as an intelligent tutor, helping students identify their learning gaps and chart a tailored study path. Students who use MEBİ regularly take diagnostic mini-quizzes or upload their assignment results; the platform's algorithms analyze this performance data to pinpoint which concepts each student has not mastered. It then recommends specific content, such as tutorial videos, practice exercises, or even AI-generated hints, to address those weaknesses. As students progress, MEBİ continually updates the learning plan to ensure a personalized trajectory for every learner. This adaptive system has been particularly useful in helping students prepare for national exams by focusing their practice on areas that need improvement. In the past year, MEBİ supported over 1.5 million students across Türkiye, a testament to its scale and impact. MEBİ has been designed to support more individualized exam preparation by helping students focus on areas where they need additional practice and feedback. By offering a one-on-one tutoring experience powered by AI, MEBİ exemplifies how technology can promote equity, allowing students who might lack access to private tutors or extra classes to receive tailored support at no cost.

5.2. DİLİM – AI-powered Language Learning Platform

Language education is a priority in Türkiye's education agenda, and the DİLİM Project is an AI-enhanced platform designed to improve students' proficiency in foreign languages. DİLİM (meaning "My Language" in Turkish) provides an interactive, personalized environment for language learners, aligned with the Common European Framework of Reference for Languages (CEFR) standards. Through DİLİM, students can practice English (and other languages will be added) with AI-driven exercises in

reading, writing, listening, and speaking, mapped to CEFR levels A1-C2. The platform is designed to support the development of reading, writing, listening, speaking, vocabulary, and grammar through interactive, personalized learning experiences aligned with CEFR levels. For instance, a learner at the B1 level can engage in a chatbot conversation with an AI, receiving corrections and suggestions to improve grammar and vocabulary. If the AI detects persistent errors or difficulties (e.g., trouble understanding past-tense constructions), it will recommend targeted exercises developed by the Ministry. DİLİM's adaptive algorithms ensure that learners are continually challenged just enough to advance their skills, a principle known to enhance language acquisition. Importantly, DİLİM supports multilingual access: while its primary goal is to teach foreign languages, the interface and instructions are available in Turkish and English (as of 2026), which helps inclusivity. With an AI-based foreign-language platform, Türkiye is tackling the long-standing issue of foreign-language attainment in its schools through personalized, scalable technology.

5.3. Students' Vocabulary Project and National LLM Efforts

In tandem with deploying AI to address immediate educational needs, Türkiye is investing in projects that strengthen the national AI research ecosystem for education. A key initiative is the Students' Vocabulary Project, a large-scale effort to develop improved Turkish language models and datasets for educational purposes. This project continuously gathers and analyses vocabulary usage from textbooks, literary texts in curricula, and even anonymized student writing samples (with strong privacy protections). The aim is to map out the vocabulary distribution and language patterns of learners across different ages and regions. The data and insights from this project inform the development of a national Large Language Model (LLM) attuned to the Turkish language and the educational context. By focusing on educational texts and student language, the resulting AI models are better at tasks such as automatic essay scoring, reading-level assessment, and generating age-appropriate reading materials. In essence, the Students' Vocabulary Project lays the groundwork for Turkish-made AI systems that understand local language nuances and curriculum standards. These innovations reduce reliance on foreign AI models and ensure that the unique characteristics of the Turkish language and curriculum are reflected in the AI tools used by teachers and students.

Together, these AI-enhanced platforms and projects demonstrate Türkiye's commitment to leveraging technology for personalized and equitable learning. Instead of one-size-fits-all solutions, the focus is on data-informed personalization, whether it is an adaptive study plan via MEBİ or a tailored language exercise in DİLİM. Notably, all these platforms have been developed or customized under the auspices of the Ministry, which means they come with public assurances of alignment to national education goals and compliance with data protection laws. The Ministry's oversight helps build trust among educators and parents that these tools are safe and

pedagogically sound. In summary, by developing indigenous AI-powered educational platforms, Türkiye is not only enriching learning opportunities today but also building expertise and infrastructure that may support its education system in the long run.

6. AI Applications Supporting Accessibility and Learners with Special Needs

One of the fundamental measures of any education system's success is how well it serves its most vulnerable learners. Under the Century of Türkiye Education Model, MoNE is committed to ensuring that students with special educational needs are not left behind in digital transformation. In the Turkish context, this includes AI-supported applications for accessibility and learner support, such as AI-generated subtitles and sign-language avatar technologies for learners with hearing impairments, AI-supported text-to-speech and visual description tools for visually impaired learners, and emerging AI-based assessment or screening tools designed to support earlier identification of learning needs. These directions are reflected in MoNE's Artificial Intelligence in Education Policy Document and Action Plan (2025–2029), as well as in related official communications on AI-supported educational applications. AI can be leveraged to dismantle barriers to learning, provide early and accurate identification of needs, and can offer personalized assistive technologies that empower students to reach their full potential. This approach aligns with the United Nations Convention on the Rights of Persons with Disabilities and Sustainable Development Goal 4, which advocates for inclusive and equitable quality education for all (United Nations, n.d.).

MoNE's *Artificial Intelligence in Education Policy Document and Action Plan (2025–2029)* explicitly includes AI-supported accessibility solutions for students with special educational needs. In particular, Policy 4.4 refers to systems that can respond to students' behavior, provide individualized feedback, support voice-reading for visually impaired learners, and enable sign language-based accessibility for learners with hearing impairments.

Türkiye's strategy moves beyond simple digitization; it employs AI to create adaptive learning environments that respond to the diversity of human ability. By integrating guidelines from UNESCO regarding the use of AI for inclusion (Miao & Holmes, 2023) and the Council of Europe's focus on non-discrimination (Council of Europe, 2024), MoNE aims to foster an ecosystem where technology compensates for physical or cognitive limitations, thereby normalizing the learning experience for students with disabilities.

6.1. AI-supported Early Detection and Intervention

One of the most promising applications of AI in special education is its ability to identify learning difficulties at an early stage, enabling timely intervention. Traditional diagnostic processes can be lengthy and dependent on subjective observation. To address this, a cooperation protocol was signed between the General Directorate of Innovation and Educational Technologies (YEĞİTEK) and the General Directorate of Special Education and Guidance Services MoNE's *Artificial Intelligence in Education Policy Document and Action Plan (2025–2029)* to launch the AI-Supported Early Warning System Project.

Starting in January 2026, this project utilizes machine learning algorithms to analyze a broad spectrum of data, including students' cognitive processing (Planning, Attention, Simultaneous, Successive; PASS theory; Das et al., 1975), executive functions, and basic academic skills in reading, writing, and mathematics. The system is designed as a human-supervised decision support tool that integrates quantitative performance data from tablet-based games, such as reaction times and error patterns, with qualitative teacher observations. By employing advanced models like Random Forest and XGBoost, the project aims to identify at-risk students before formal referral processes, providing personalized intervention programs to support individual learning needs within the school environment.

Such tools may be designed to detect subtle indicators of learning difficulty, such as hesitation patterns, recurring phonological errors, or atypical reading behaviors that may be harder to notice in crowded classroom settings. By gamifying the screening process, the system aims to reduce anxiety for the student while gathering high-quality diagnostic data. This proactive use of data aligns with the OECD's recommendation to use learning analytics to identify at-risk students and provide targeted support before learning gaps widen (OECD, 2025). Importantly, these tools operate under strict ethical protocols (MoNE, 2025b).

6.2. Assistive Technologies and Adaptive Content

For students with sensory or physical impairments, accessing standard curriculum materials has historically been a significant challenge. With the power of AI technologies, MoNE plans to utilize generative AI and natural language processing (NLP) to make existing educational platforms, such as EBA and MEBİ, universally accessible, as stated in MoNE's AI Action Steps 2025-2029 under the third goal (MoNE, 2025a).

As stated in Policy 4.4 of MoNE's 2025 Action Plan, accessibility-oriented AI applications include AI-supported voice-reader systems for students with visual impairments and sign-language-based solutions for students with hearing impairments. The policy also refers more broadly to AI-supported systems that can respond to learner behavior and provide feedback tailored to individual needs. The

digital avatars can automatically translate spoken or written content from lesson videos into Turkish Sign Language in real-time. Similarly, AI-supported automated text-to-speech (TTS) tools will be provided to visually impaired students, delivering high-fidelity audio descriptions of images and diagrams in textbooks, going beyond standard screen readers to interpret complex visual data. These innovations can significantly expand the library of accessible content, reducing reliance on the limited availability of human interpreters for every piece of digital media. These efforts align with the European Council's emphasis on ensuring information accessibility as a human right (European Parliament & Council of the European Union, 2024) and OECD's *"Leveraging artificial intelligence to support students with special education needs"* Report (Linsenmayer, 2025). By allowing content to be automatically reformatted to suit the learner's specific sensory and cognitive profile, Türkiye is operationalizing the principle that the environment must adapt to the student, not the other way around.

6.3. AI-Potential for Empowering Special Education Teachers

The role of the special education teacher is often administratively heavy, involving the creation of detailed Individualized Education Programs (IEPs) and constant progress monitoring. To support these educators, AI assistants can create initial draft IEP goals based on student data and curriculum standards, as it aligns with OECD recommendations (Linsenmayer, 2025). These AI tools can serve as force multipliers for special education teachers. For instance, an AI assistant can analyze a student's progress data over a semester and suggest specific pedagogical adjustments or new learning targets for the teacher to review. This automated analysis can allow teachers to spend less time on paperwork and more time engaging directly with their students. As noted in UNESCO's guidance for generative AI (Miao & Holmes, 2023), the objective is to use AI to augment the teacher's capacity to provide human care and specialized instruction. By reducing the administrative burden, AI helps mitigate burnout among special education professionals and ensures that instructional decisions are data-informed.

7. Ethical Considerations and Safeguards

While Türkiye is enthusiastic about the potential of AI in education, it approaches this transformation with caution and a strong ethical compass. Policymakers and educators alike recognize that without proper safeguards, AI could pose risks to privacy, fairness, and even the fundamental ethos of education. Therefore, hand in hand with innovation, Türkiye has implemented ethical guidelines, oversight mechanisms, and public discussions to ensure that the use of AI in schools respects human values and rights (MoNE, 2025a, 2025b). This commitment to ethics is a national priority. It resonates with international calls for responsible AI, such as UNESCO's emphasis on ethics of AI in education and the OECD's human-centered values framework (OECD, 2024b; UNESCO, 2022).

7.1. Data Privacy and Security

Student data is extremely sensitive and should be kept confidential, and protecting it is the cornerstone of any ethical AI policy. All AI platforms and tools introduced by MoNE comply with Türkiye's personal data protection laws (KVKK; aligned mainly with the EU's GDPR), which mandate strict controls on data collection, usage, and storage. For instance, the personalized learning platform MEBİ collects performance data to tailor learning. Still, this data is stored securely on domestic servers controlled by the Ministry and is anonymized for any aggregated analysis. Explicit consent is obtained from parents or students (as appropriate for their age) to use their data to fuel AI recommendations, and they are informed about which data is used and how. No AI application in Turkish schools is allowed to access a camera or microphone by default; any such use (such as a language app listening for pronunciation) must be actively enabled by the user each time, ensuring that surveillance-like scenarios do not arise. This careful attention to privacy follows the principle that students' rights to privacy must not be sacrificed in the pursuit of technological advancement, a view strongly reinforced by OECD's AI Principles and UNESCO's ethical guidelines.

7.2. Fairness and Bias Mitigation

An important ethical concern with AI systems is the risk of bias; algorithms might inadvertently favor certain groups of students over others or reinforce societal biases. Türkiye is proactively addressing this by testing and tuning its educational AI models for fairness. During the development of the national large language model (as part of the Students' Vocabulary Project), the training data was curated to include a balanced representation of dialects, regions, and gendered language use to prevent the model from, say, understanding Istanbul Turkish better than foreign-accented Turkish. AI systems like the one in MEBİ are checked to ensure that recommendations or groupings do not systematically advantage already high-performing students or neglect certain demographics. For example, if an adaptive system were giving more challenging content to students from certain urban schools and not providing the same to equally capable students in rural schools due to hidden bias in data, that would be flagged and corrected. The Ministry collaborates with academic researchers to conduct algorithmic audits on its AI tools. Moreover, transparency is encouraged, and schools are advised to explain AI-generated decisions to students wherever relevant (echoing the principle of explicability). Suppose a learning platform flags a student as needing remedial help in reading. In that case, teachers discuss with the student how that conclusion was reached (e.g., based on recent quiz results) and jointly plan the next steps, rather than leaving the AI's judgment unquestioned. This practice aligns with the notion that AI's decisions in education should be open to scrutiny and, if needed, challenge, maintaining human accountability (OECD, 2025).

7.3. Maintaining Human Dignity and Agency

Central to Türkiye's ethical stance is the belief that AI should never undermine human dignity, autonomy, or the essential human relationships in education. The Ministry has explicitly stated that technology must serve pedagogy, not replace it, encapsulating the ethos that teachers and students are not to be reduced to mere data points or automated targets. In practical terms, this means teachers are always in control of AI tools in their classrooms; an AI assistant can suggest or perform an action, but the teacher decides whether to use or override it. Likewise, students are taught to use AI as a tool for their learning, but not to become dependent on it for thinking or to have their educational fate determined solely by an algorithm. For example, while automated grading can score a multiple-choice test, the overall assessment of a student's ability includes project work, oral presentations, and other human-evaluated aspects to give a complete picture. Suppose an AI tutoring system recommends a particular track for a student (e.g., focusing more on literature than on science). In that case, it is considered one input among many, along with the student's own aspirations and teachers' guidance. This ensures that student agency, their ability to make choices about their learning, is preserved. It resonates with UNESCO's human-centered approach, which stresses that AI should support human intellectual development without undermining it (Vincent-Lancrin & van der Vlies, 2020).

7.4. Ethics Education and Stakeholder Engagement

Another facet of Türkiye's approach is educating stakeholders about AI ethics. The ethical guidance booklet (MoNE, 2025b) distributed by MoNE not only instructs on what to do, but also includes sections explaining why these precautions matter, in accessible language for non-specialists. Schools have held seminars for students on topics like digital footprints, how AI algorithms work, and why fairness in AI is an issue, effectively integrating some AI ethics awareness into the broader curriculum. Teachers have professional development modules on ethical use of technology that include scenario-based discussions. For example, is it okay to use AI to monitor whether students are paying attention in class via a camera? The consensus is generally no, as that could violate trust and privacy. By fostering dialogue, the Ministry ensures that ethics is a living conversation, not just a rulebook. Parents are also engaged through school meetings and materials that explain the AI tools being introduced, the benefits they bring, and the measures in place to protect children. This transparency is key to public trust.

Finally, Türkiye remains aligned with global ethical standards to continuously improve its practices. It has endorsed UNESCO's 2021 Recommendation on the Ethics of AI (Miao et al., 2021), and the Ministry uses that as a reference to evaluate its own policies. The country's engagement with the Council of Europe also keeps it attuned to developments in human-rights-centered AI governance. For example, if the Council of Europe recommends stronger measures on facial recognition in schools, Türkiye is

poised to adopt them. However, it has already taken a cautious stance (essentially disallowing any invasive student surveillance technologies). The dynamic nature of AI means ethics policies are periodically reviewed.

In conclusion, ethics is not an afterthought in Türkiye's AI in education journey; it is a parallel track of action that ensures the technological innovations do not outrun the capacity to use them wisely and justly. By prioritizing privacy, fairness, human agency, and broad engagement, Türkiye strives to set an example of responsible AI adoption in education, one where the transformative power of AI is harnessed in service of human-centered values and equitable opportunity.

Conclusion

Türkiye's experience integrating AI into its education sector demonstrates a comprehensive, values-driven approach that other nations can learn from. The MoNE has simultaneously pursued innovation and upheld ethical standards, ensuring that the digital transformation of schools remains anchored in human-centric principles. Under the vision of the Century of Türkiye Education Model, the country views AI as a strategic tool to enhance the quality and inclusivity of education in the coming decades. This vision is manifested in robust national policies and action plans, concrete curriculum changes to build future-ready skills, and the deployment of cutting-edge learning platforms and teacher tools developed within Türkiye's own ecosystem.

A recurring theme in Türkiye's approach is empowering students through personalized learning and AI literacy, empowering teachers through AI assistants and professional development, and empowering the education system at large to make data-informed decisions. Students engage with adaptive learning materials that address their individual needs; teachers are beginning to offload repetitive tasks and focus more on creative pedagogy; and administrators have better analytics at their disposal to target interventions. Moreover, these advancements occur without compromising on equity. By investing in nationwide infrastructure like smart boards and internet connectivity, and by tailoring solutions for multilingual and diverse users, Türkiye ensures that no region or group is left behind in the AI-driven educational renaissance.

Türkiye's journey highlights that embracing AI in education is not just a technical endeavor but a deeply human one. It requires continuous dialogue with stakeholders; training and listening to teachers, informing and reassuring parents, and involving students as active participants in their learning process. The Ministry's policies of ethical oversight and international cooperation fortify this human focus. By establishing an ethics committee and guidelines, Türkiye makes it clear that any use of AI in schools must be transparent and fair and respect the dignity of learners and educators. This aligns with the global consensus championed by bodies such as

UNESCO and the OECD, reinforcing Türkiye's alignment with international standards for trustworthy AI. The collaboration with international partners, including sharing experiences with OECD working groups or contributing to UNESCO's initiatives, also highlights that Türkiye sees its efforts as part of a global movement to harness AI for social good in education, rather than an isolated national experiment.

Looking ahead, Türkiye continues to refine and expand its AI-in-education initiatives. The next steps likely include scaling up successful pilot projects, such as the FEYZA AI teaching assistant, to more classrooms, enriching the AI curriculum across all levels as technology evolves, and perhaps developing new AI tools for areas such as special education or guidance counseling. There will also be ongoing challenges to navigate, including ensuring sustainable funding for tech infrastructure, updating regulations as new AI applications (such as ever-more powerful generative AI models) emerge, and continually training the workforce to keep pace with technological change. However, the foundational work, a clear vision, a strong policy framework, a culture of teacher involvement, and ethical guardrails mean Türkiye is well-equipped to adapt and iterate on its strategies. In the spirit of continuous improvement, Turkish educational authorities are closely monitoring outcomes and research findings and are ready to make evidence-based adjustments to their AI implementations.

In conclusion, Türkiye's perspective on AI in education is one of cautious optimism and proactive leadership. It demonstrates that a middle path is possible between uncritical tech adoption and fearful resistance: a path where AI is welcomed as a powerful ally in the quest for quality education, but its use is meticulously planned, scrutinized, and aligned with human values. By ensuring that technology serves pedagogy and not the other way around, Türkiye keeps teachers and learners at the center of the educational universe. The lessons from Türkiye's approach, balancing innovation with inclusivity and ambition with ethics, offer valuable insights for any nation seeking to navigate the exciting yet complex landscape of AI in education. As the world moves further into the AI age, Türkiye's human-centered, equity-driven model of educational transformation stands as a compelling example of how to embrace the future without losing sight of what matters most in education: the people it is meant to serve.

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About the Authors

Mustafa CANLI

Ministry of National Education of Türkiye | [mustafa.canli\[at\]meb.gov.tr](mailto:mustafa.canli[at]meb.gov.tr)

ORCID: 0009-0000-2324-1921

Mustafa CANLI graduated from the Middle East Technical University (METU), Department of Mechanical Engineering. He furthered his education in the United States, earning dual master's degrees in Information Systems and Business Administration (MBA) from Northeastern University in Boston. His professional career began in 2006, focusing on the management of government IT projects and the development of e-government systems. Before his current tenure, he served as the Head of the Department of Information Technologies at Ankara Hacı Bayram Veli University. In 2023, he was appointed as the Director General of Innovation and Educational Technologies. In this role, he leads Türkiye's national educational technology strategies, including the management of the Educational Informatics Network (EBA), the integration of artificial intelligence in education, and the development of digital learning infrastructures.

Dr. Zafer ÖZEN

Ministry of National Education of Türkiye, YEGITEK | [zafer.ozen\[at\]eba.gov.tr](mailto:zafer.ozen[at]eba.gov.tr)

ORCID: 0009-0007-5760-7574

Dr. Zafer Özen completed his bachelor's degree at Dokuz Eylül University in the Department of Physics Teacher Education and his graduate studies at Purdue University (USA), earning both his master's and Ph.D. in Educational Studies with a focus on Gifted, Creative, and Talented Studies. He completed his doctorate with a dissertation titled "A Comprehensive Study on Access, Creative Potential, and Identification of STEM Talents with Machine Learning," which explored the intersection of advanced data analytics and talent identification. Currently, he works as a National Education Expert at the Department of Artificial Intelligence and Big Data Applications within the Innovation and Educational Technologies General Directorate of the Ministry of National Education of Türkiye.

Dr. Hüseyin ULUKUZ

Ministry of National Education of Türkiye, YEGİTEK | [huseyin.ulukuz\[at\]eba.gov.tr](mailto:huseyin.ulukuz@eba.gov.tr)

ORCID: 0000-0003-2272-6112

Dr. Hüseyin Ulukuz graduated from Ankara University with a degree in Electrical and Electronics Engineering, where he conducted thesis research in image processing. He completed his master's degree in the Digital Technologies, Communication and Education at the University of Manchester (UoM), focusing on augmented reality and student engagement. He later completed his PhD at the UoM, focusing on the technical foundations of Web 2.0 technologies, with particular emphasis on user-generated content, participatory digital landscapes, and their implications for contemporary learning ecosystems. Currently, he serves as a National Education Expert at the Ministry of National Education of Türkiye, where he also undertakes the role of AI Policy Coordinator within the Department of Artificial Intelligence and Big Data Applications at the Innovation and Educational Technologies General Directorate. In this capacity, he works on digital transformation strategies, AI integration in education, learning analytics, and national and international AI policy development initiatives.

Dr. Emre DİNÇ

Ministry of National Education of Türkiye, YEGİTEK | [emre.dinc\[at\]eba.gov.tr](mailto:emre.dinc@eba.gov.tr)

ORCID: 0000-0002-1838-4044

Emre Dinç earned his Ph.D. in Learning, Design, and Technology from Penn State University (2019–2024), with a dissertation focusing on reasoning in pair-programming geometric patterns. Prior to this, he completed an M.Ed. in Educational Technology at University of Delaware (2017–2018), exploring personalization in language-learning applications, and holds a B.Sc. in Mathematics Education from Necmettin Erbakan University, Türkiye (2009–2014). Currently serving as a National Education Expert at the Ministry of National Education, Türkiye (since 2024), Emre leads the design and implementation of AI-powered educational projects. He also functions as Principal Consultant at Piyonist, overseeing development of AI-driven chess-learning platforms. During his doctoral studies, Emre contributed extensively to STEM education, computing, and teacher-development initiatives as a Graduate Assistant & Researcher. Emre's research interests span STEM education, robotics, equity in STEM, AI in education, teacher professional development, play-based learning, and data-driven educational insights. He has authored peer-reviewed journal articles, book chapters, and conference proceedings on AI in education, computational thinking, and teacher development. Beyond research, he mentors university students in AI and deep-learning projects, delivers workshops on AI ethics and computational thinking, and has presented at international conferences. He also reviews for major educational journals and contributes to grant-writing and educational policy translation efforts.