

THE USE OF ARTIFICIAL INTELLIGENCE IN EDUCATIONAL MEASUREMENT AND EVALUATION PROCESSES: OPPORTUNITIES, LIMITATIONS AND FUTURE PERSPECTIVES

Hakan DAĞLI

Ministry of National Education
E-mail: hakandagli85@gmail.com
ORCID: 0000-0002-5635-5439

Osman ÇARDAK

Necmettin Erbakan University
E-mail: ocardak@erbakan.edu.tr
ORCID: 0000-0001-5598-3364

INTRODUCTION

The twenty-first century has been a period in which education systems have rapidly digitalized and data-driven decision-making processes have come to the fore. This transformation has brought about fundamental changes not only in teaching methods but also in the way learning is assessed and measured. Although traditional approaches to measurement and evaluation have long been effective in determining students' levels of knowledge, they remain limited in capturing the depth of learning, creativity and higher-order thinking skills (Cohen & Manion, 2018). The diversity in education, individual differences in learning and the increasing impact of technology make it necessary for measurement and evaluation processes to become more flexible, personalized and data-based.

At this point, artificial intelligence (AI) introduces a new dimension to assessment processes in education. AI is generally defined as a field of science that aims to equip computer systems with human-like thinking, learning and problem-solving abilities (Russell & Norvig, 2021). The use of AI in education is becoming increasingly widespread in such areas as monitoring student performance, identifying learning gaps, automatic scoring systems and personalized feedback mechanisms (Luckin, Holmes, Griffiths, & Forcier, 2016). In particular, in measurement and evaluation processes, AI-based systems save teachers time, increase objectivity and enable in-depth data analyses through learning analytics.

However, the use of AI in the field of measurement and evaluation brings not only opportunities but also various ethical, pedagogical and methodological debates. Issues such as data privacy, algorithmic bias, and the validity and reliability of assessment tools are considered important factors that limit the

applicability of AI-based systems in education (UNESCO, 2023). In addition, how AI-supported assessment tools transform the role of teachers and how students perceive these systems are also examined carefully by researchers (Popenici & Kerr, 2017).

In this chapter, current approaches to the use of AI in educational measurement and evaluation processes are discussed from a multidimensional perspective. First, the development of AI-supported assessment applications and their impact on education systems are addressed; then the opportunities they offer and the limitations encountered are evaluated. Finally, possible future directions and policy suggestions are presented, offering a holistic perspective on the AI-shaped nature of assessment in education.

The Transformation of Measurement and Evaluation in Education

Measurement and evaluation are among the most important components of the teaching–learning process. Measurement involves determining students' levels of knowledge, skills or attitudes, while evaluation refers to interpreting these findings to make educational decisions (Nitko & Brookhart, 2014). For many years, measurement processes were mostly carried out through standardized tests, written exams or teacher observations. Although these approaches provide advantages in terms of ease of implementation and objectivity, they have not sufficiently reflected students' thinking processes, creative productions and problem-solving skills (Black & Wiliam, 1998).

The integration of digital technologies into learning environments has also reshaped the understanding of measurement and evaluation. As learning processes have moved to online platforms, the volume and variety of data collected from students have increased dramatically. This development has brought the concept of learning analytics to the agenda. Learning analytics refers to making sense of students' interactions in digital environments in order to gain a deeper understanding of learning processes (Siemens & Long, 2011). In this way, measurement is transformed from a process limited to determining an outcome into a dynamic structure that tracks the learner's journey.

In this context, computer adaptive testing (CAT) has emerged as a significant innovation. CAT systems automatically determine the difficulty level of subsequent items according to each student's responses, thereby offering a personalized assessment process (Wainer, 2000). This method yields results that are closer to the learner's true proficiency level while also making the examination process shorter and more efficient.

In addition, alternative assessment approaches have gained renewed importance with the help of technology. Portfolio assessments, project-based work and digital performance tasks make it possible to evaluate students' multifaceted skills (Gikandi, Morrow, & Davis, 2011). These methods assess not only the learner's level of knowledge but also their ability to apply, analyze and produce knowledge.

This transformation has also redefined the roles of teachers. Teachers are no longer merely individuals who assign grades, but have become assessment designers who analyze data and guide students' learning processes (Ercikan & Pellegrino, 2017). In digitalized assessment processes, teachers' data literacy and their competence in pedagogically interpreting measurement results have become as important as their content knowledge. Therefore, the integration of AI into these processes is not only a technical innovation, but also an indication of a paradigmatic transformation in the nature of educational measurement and evaluation.

AI-Based Assessment Applications

With the widespread use of AI technologies in education, measurement and evaluation processes have become increasingly flexible, dynamic and data-driven. AI has the potential not only to analyze whether students' responses are correct or incorrect, but also to examine their thinking processes, problem-solving strategies and learning behaviors (Heffernan & Heffernan, 2014). In this respect, assessment is turning into a holistic reflection of the learning process rather than being only an outcome-based evaluation.

Automated Scoring Systems

AI-supported automated scoring systems provide significant convenience especially in the evaluation of open-ended questions. Thanks to natural language processing techniques, students' written responses can be analyzed semantically; the system can evaluate the correctness, clarity and conceptual coherence of an answer. In this way, the long scoring processes of teachers can be greatly accelerated and subjective differences in evaluation can be reduced (Shermis & Burstein, 2013). Some of these systems perform scoring by learning from pre-labeled sample responses, while others build their own linguistic patterns through deep learning models. For example, systems used in the evaluation of writing skills can analyze a student's text in terms of grammar, vocabulary use and coherence and assign a score accordingly.

Computer Adaptive Testing (CAT)

Another innovation that AI has brought to the field of measurement is computer adaptive testing. In these systems, each item is selected based on the student's response to the previous item; thus the difficulty level of the test is adjusted according to the individual learner (Wainer, 2000). AI algorithms continuously make predictions about the student's knowledge level based on their response patterns. This approach both shortens the duration of the test and provides a more accurate measurement of the learner's actual performance. Some international exams and online testing platforms use CAT algorithms to reduce measurement error and to tailor the test experience to each student.

Learning Analytics and Predictive Assessment

Learning analytics is one of the most powerful components of AI in education. Digital traces left by students in online environments—such as login times, number of clicks and patterns of incorrect responses—can be analyzed to construct individual learning profiles (Siemens & Long, 2011). These data can be used to predict future performance or to identify learning difficulties at an early stage. For example, an AI-supported learning management system may detect that a student has a tendency towards low achievement and send learning alerts to both the student and the teacher. In this way, assessment systems are transformed from structures that merely evaluate past performance into systems with a preventive function oriented towards the future.

Assessment Based on Visual and Behavioral Data

In recent years, AI has started to measure students' performance not only through text-based data but also via visual and behavioral data analysis. Through methods such as facial recognition, emotion analysis or eye-tracking, measurements can be made regarding students' attention, motivation and emotional states (D'Mello & Graesser, 2015). These systems are particularly important for monitoring student engagement in online education and determining whether learners actively contribute to the learning process. However, such applications also lead to ethical debates because the collection and processing of behavioral data require careful regulation of privacy and informed consent.

Sample Applications from Türkiye and the World

AI-based assessment applications are not only on the agenda in developed countries, but are also increasingly attracting the attention of educational institutions in Türkiye. Automatic scoring of open-ended items, AI modules integrated into learning management systems and platforms that monitor students' learning performance in real time are becoming more common. At the international level, platforms such as Gradescope, Turnitin Feedback Studio, Khanmigo and ChatGPT-based educational applications stand out as tools that support teachers in the assessment process. These platforms both accelerate evaluation and offer instant feedback to learners, thereby personalizing the learning experience.

Gradescope

Gradescope is a platform initially developed to facilitate the grading process of written exams in higher education. Thanks to its AI-supported image recognition system, teachers can score students' handwritten responses in a digital environment. The system groups similar responses and allows them to be evaluated collectively, which provides considerable time savings especially in large classes (Pritchard, Lee, & Bao, 2020). In addition, Gradescope analyzes the scores assigned by the teacher and performs consistency checks, offering suggestions for correction when necessary.

Turnitin Feedback Studio

Turnitin Feedback Studio is used not only for plagiarism detection but also for the evaluation of students' written products and the provision of feedback. The system compares student texts with a large academic database and generates a similarity report; in addition, it allows teachers to add written comments, audio feedback and scoring criteria. Turnitin's similarity reports help teachers maintain academic integrity, while quick-mark and rubric tools show students in a concrete way the areas in which they need to improve (Cheema & Sheridan, 2021). In this way, assessment becomes not merely a process of assigning grades but also one that focuses on learning-oriented feedback.

Khanmigo

Khanmigo is an AI-supported teaching and assessment assistant developed by Khan Academy. Based on the ChatGPT infrastructure, it provides students with personalized guidance, produces questions and offers instant feedback according to students' responses. When a student makes an error while solving a problem, Khanmigo does not directly give the correct answer but instead provides hints that guide the learner through the correct reasoning process (Khan Academy, 2024). This feature makes it possible to evaluate the student's cognitive processes and supports process-oriented assessment.

ChatGPT-Based Educational Applications

ChatGPT and similar natural language processing-based systems are now increasingly used by teachers in assessment processes. ChatGPT can analyze students' open-ended responses, provide feedback on their written work and be integrated into rubric-based scoring systems. For example, a teacher can upload students' explanations about a science concept to ChatGPT and request an evaluation of scientific accuracy, conceptual coherence and language use for each response. Such applications make assessment semi-automated in a way that supports the teacher. However, it is emphasized that these systems should be used within a framework of human-AI collaboration rather than completely replacing teacher judgment (UNESCO, 2023).

Ethical, Reliability and Validity Dimensions

The integration of AI into educational measurement and evaluation brings with it not only technical advantages but also new debates in the areas of ethics, reliability and validity. While the fast, objective and data-driven nature of AI systems creates significant opportunities for educators, errors, biases or lack of transparency that may arise in algorithmic decision-making processes can lead to serious problems for the principle of fairness in education (Baker & Hawn, 2021). Therefore, it is necessary not only to assess the pedagogical value of technological innovations but also to carefully determine their ethical boundaries.

Algorithmic Bias and Issues of Fairness

AI systems are models that learn based on data. However, since these data are often created by humans or collected from past educational practices, they may contain implicit biases. For example, a dataset dominated by response patterns from students of certain socio-economic groups may cause the algorithm to generate systematic differences against other groups in the evaluation process (Holmes, Bialik, & Fadel, 2021). This situation may make it difficult to protect the principle of fairness in AI-supported assessment systems. Therefore, the models developed should be trained on data that are inclusive of different student groups; regular bias tests should be conducted and the results should be audited by independent ethics committees. Teachers' knowledge of the limitations of AI systems and their support of AI-generated assessment results with human judgment serve as important balancing factors that reduce ethical risks (UNESCO, 2023).

Data Privacy and Security

AI systems require large amounts of student data to function effectively. These data may include personal information such as response histories, texts, behavioral patterns and, in some cases, even facial expressions or voice recordings. Therefore, data privacy and information security are among the most critical issues in AI-based assessment systems. The unauthorized sharing, misuse or exposure of data through cyberattacks may lead to the disclosure of students' private information. To minimize these risks, systems must be designed in accordance with national and international privacy regulations, and students and parents must be informed about what data are collected, how these data are processed and with whom they are shared. Transparency increases learners' trust in these systems and strengthens the pedagogical value of AI-supported assessment.

Debates on Validity and Reliability

As with any measurement tool, validity—the extent to which a tool measures what it is intended to measure—and reliability—the consistency of measurement results—are fundamental elements in AI-based assessment systems. However, the boundaries of these concepts differ from those in traditional measurement tools when it comes to AI systems (Ercikan & Pellegrino, 2017). In automated scoring systems, ensuring that the student's response is evaluated correctly requires that the model be trained with appropriate linguistic and conceptual patterns. In such systems, validity depends not only on the accuracy of the scores but also on the extent to which the system can capture the student's cognitive processes. In terms of reliability, it is important that the system produce consistent results for different students and different testing sessions. For this reason, AI-based assessment tools should be regularly tested using mixed validation methods such as comparisons with human raters and cross-analyses.

Human–AI Collaboration and Ethical Balance

It is not expected that AI will completely remove humans from the assessment process in education. On the contrary, the most effective models generally operate on the basis of human–AI collaboration (Luckin et al., 2016). AI is strong in areas such as data analysis, pattern recognition and providing rapid feedback, whereas teachers are indispensable in evaluating context, students' emotional states and pedagogical appropriateness. The ethically ideal approach is to position AI as an assistant that supports teachers' decision-making. In this way, the results produced by the system are blended with human judgment to achieve more just, reliable and meaningful evaluations.

Transparency and Accountability

For AI systems to be used ethically in education, the principles of transparency and accountability are indispensable. Students, teachers and administrators should be able to understand how the system works, what data it analyzes and how it produces results. Non-transparent systems reduce user trust and diminish the pedagogical value of assessment results (Baker & Hawn, 2021). Therefore, developers are advised to share documentation that clearly explains algorithmic decision-making processes, while educational institutions are advised to conduct regular ethical audits. The implementation of AI-based assessment systems in harmony with the principles of ethics, reliability and validity requires not only technological change but also cultural and pedagogical transformation.

Future Trends and Policy Recommendations

The rapid development of AI technologies is reshaping the future of measurement and evaluation processes in education. This transformation brings not only a technological innovation but also a pedagogical, ethical and administrative paradigm shift. In the upcoming period, it is foreseen that assessment systems will become more personalized, adaptive and integrated into the learning process (UNESCO, 2023). This section addresses prominent future trends and the regulations that should be made at the policy level.

Personalized Assessment and Adaptive Systems

With the development of AI, educational measurement and evaluation are becoming increasingly personalized. Because each student's learning pace, style and level of knowledge differ, standard test approaches are becoming insufficient. AI-supported adaptive systems can analyze students' performance data in real time and individualize assessment. For example, the system can examine the speed of responses, recurring error patterns and conceptual misunderstandings, and determine the difficulty level of subsequent items accordingly (Wainer, 2000). In the future, these systems are expected to evolve into adaptive assessment practices that also analyze students' emotional reactions. In this way, assessment will become a multidimensional process that covers not only cognitive but also affective dimensions.

AI-Supported Feedback Mechanisms

One of the basic elements of effective assessment in education is feedback. AI does not simply assign grades; it can also provide meaningful and timely feedback showing in which concepts the student made errors, why these errors occurred and how they can be corrected. In the future, AI systems are expected to produce predictive feedback by analyzing students' prior learning data. Such a system may, for instance, generate alerts such as "This student continues to repeat the same errors on this topic even after several attempts; there is probably a conceptual misconception." These developments enable teachers to better understand their students, create individualized support plans and detect learning losses at an early stage.

Teacher Education and AI Literacy

The effective use of AI-based assessment systems depends on teachers' ability to pedagogically make sense of these technologies. A teacher should not only know how to operate the system but also understand how it makes decisions, what data it uses in scoring and what limitations it has (Ercikan & Pellegrino, 2017). In this context, AI literacy will become an important component of future teacher education programs. Supporting teachers in areas such as data interpretation, ethical evaluation and awareness of algorithmic bias will enhance the pedagogical impact of technology. The Ministry of National Education and higher education institutions should lead this process by developing practice-oriented modules on AI within teacher education.

Development of National and Institutional Policies

For AI-based assessment tools to be used safely, ethically and effectively, guiding principles need to be defined at the policy level. In this scope, the following should be established: national ethical protocols for the protection of student data; accreditation standards that regulate the use of AI tools in educational institutions; and frameworks that balance the responsibilities of teachers and students (UNESCO, 2023; OECD, 2021). In addition, it is recommended that national education policies consider AI not merely as a tool for assessment but as a component that supports learning, and that teacher decision-making mechanisms be kept at the center.

Human-AI Collaboration and New Roles

The future understanding of measurement and evaluation will be built on an interactive model of collaboration between humans and machines. While AI is a powerful tool for big data analysis and rapid feedback generation, the teacher will remain the decision-maker who evaluates the pedagogical context, the student's emotional state and the subtleties of the learning environment (Luckin et al., 2016). In this perspective, the teacher assumes the role of an AI-augmented assessor. The learner, in turn, becomes not only an object of assessment but also an active subject of the process. In this way, AI becomes a partner that strengthens the human element at the heart of teaching rather than replacing it.

Future Research Areas in AI-Based Assessment

Future research will focus on the validity structures, long-term learning effects and ethical awareness dimensions of AI-supported assessment systems. In particular, students' perceptions of and attitudes towards such systems, as well as their levels of motivation, will constitute important research topics. In addition, examining the achievement differences of students from different socio-economic backgrounds in AI-based assessments will provide new evidence for educational equity (Holmes, Bialik, & Fadel, 2021).

Policy Recommendations

Policy recommendations regarding AI-based measurement and evaluation may be summarized as follows:

- Updating data privacy laws so that AI systems used in education are fully aligned with personal data protection regulations.
- Establishing ethical review committees that monitor AI systems at school and university levels.
- Updating teacher education programs so that AI awareness and ethical data use become integral parts of curricula.
- Creating national standards, in coordination with the Ministry of National Education and the Council of Higher Education, for the validity and reliability of AI-based assessment tools.
- Implementing pilot projects on AI applications in schools and regional measurement centers, and scaling systems up gradually based on the findings.

AI-Based Measurement and Evaluation Approaches of the Ministry of National Education in Türkiye

In recent years, the Ministry of National Education (MEB) in Türkiye has structured its digital transformation vision in line with long-term education goals and has begun to integrate AI technologies into measurement and evaluation processes. In MEB's strategic plans, the digitalization, personalization and data-based support of decision-making processes in measurement and evaluation systems are among the main objectives (Ministry of National Education, 2023). This vision foresees the active use of AI not only in examination practices but also in the multidimensional monitoring of student achievement.

Digital Assessment and Learning Analytics Applications

The Education Informatics Network (EBA) platform, operated by MEB, is one of the most comprehensive implementations in Türkiye in terms of data-supported assessment and learning analytics. Exams and activities administered via EBA collect large-scale performance data from students, which are processed using analytic tools. In this way, trends in student achievement, topic-based areas of difficulty and learning gaps can be identified. In addition, digital test applications carried out through Measurement and Evaluation

Centers (ÖDMs) provide a basis for adaptive test designs supported by AI. The electronic assessment systems used in these centers can score student responses instantly and provide teachers with analysis reports at both individual and classroom levels.

Models for Predicting Student Achievement

MEB has also begun to develop models for predicting student achievement by using data mining and AI techniques. Especially in large-scale examinations such as the High School Entrance System (LGS) and the Higher Education Institutions Examination (YKS), performance predictions are made and areas of difficulty are identified by analyzing the data of millions of students from previous years. This approach is one of the reflections of predictive assessment in the Turkish context. In addition, MEB aims for AI-supported systems to make evaluations based not only on exam results but also on performance indicators during the learning process. In this way, not only students' outcome achievement but also their learning trajectories can be measured.

Open-Ended Response Analysis and Automatic Scoring Pilots

Recent research and pilot projects in Türkiye show that MEB has begun to test natural language processing-based systems for the evaluation of open-ended items. These systems can analyze students' written responses at the linguistic and conceptual level and generate scores that are alternative or supportive to teachers' ratings. For example, open-ended questions in Turkish and Science courses at the lower-secondary level are being tested with automatic scoring algorithms; as a result, both the time required for evaluation is reduced and consistency among teachers is increased. It is planned that these applications will be scaled up nationwide in the coming years.

Awareness in Teacher Education

MEB has also identified the development of teachers' AI literacy in the field of measurement and evaluation as one of its priority goals. In this scope, in-service training modules on AI awareness, the use of digital assessment tools and data interpretation skills have been developed on online teacher training platforms. In addition, strategy documents on digital transformation in education include sample lesson implementations that demonstrate how teachers can use AI-supported assessment tools in classroom evaluation processes. These efforts aim to increase teachers' capacity to use technology for pedagogical purposes.

Future Plans

Among MEB's long-term goals is the development of national AI-supported assessment systems. In this context, it is planned to establish learning analytics platforms that can monitor students' academic development multidimensionally, provide personalized feedback and conduct data analysis on a national scale. These initiatives strengthen Türkiye's potential to become a regional actor in AI-based assessment practices in education.

Conclusion and Recommendations

The widespread use of AI technologies in education is fundamentally transforming the understanding of measurement and evaluation. The transition from traditional test-based approaches to data-driven, personalized and dynamic systems is not only a technological innovation but also a pedagogical necessity. Classical assessment methods that are limited to determining students' levels of knowledge cannot fully reflect the nature of learning. For this reason, AI-supported systems come to the fore as tools that can track learners' cognitive processes, recognize learning styles and provide real-time feedback (Luckin et al., 2016).

While the integration of AI into assessment processes offers significant advantages for teachers, it also brings ethical and methodological responsibilities. Issues such as algorithmic bias, data privacy and the validity and reliability of assessment results must be carefully managed for these systems to be used sustainably in education. In addition, AI should not be seen as a tool that completely replaces human decision-making but as a component that supports the professional judgment of teachers. Keeping the final decision in education in human hands is important for maintaining ethical responsibility and pedagogical sensitivity (UNESCO, 2023).

In conclusion, AI has given a new meaning to measurement and evaluation in education: assessment has now become a dynamic process that aims not only to determine what the student knows but also to understand how they learn and how learning can be improved. The success of this transformation lies in education systems that can balance the power of technology with human guidance and that build an assessment culture which is fair, transparent and learner-centered.

REFERENCES

- Baker, R. S., & Hawn, A. (2021). Algorithmic bias in education. *International Journal of Artificial Intelligence in Education*, 31(1), 1–12.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7–74.
- Cheema, J. R., & Sheridan, K. (2021). Effectiveness of Turnitin in promoting academic integrity and improving academic writing. *Journal of Academic Ethics*, 19(4), 567–585.
- Cohen, L., & Manion, L. (2018). *Research methods in education* (8th ed.). Routledge.
- D’Mello, S., & Graesser, A. (2015). Feeling, thinking, and computing with affect-aware learning technologies. In *Learning technologies handbook* (Vol. 3, pp. 1–26). U.S. Army Research Laboratory.
- Ercikan, K., & Pellegrino, J. W. (2017). *Validation of complex assessments: Perspectives and challenges*. Routledge.
- Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Educational Research Review*, 6(1), 7–24.
- Heffernan, N., & Heffernan, C. (2014). The ASSISTments ecosystem: Building a platform that brings scientists and teachers together for minimally invasive research on human learning and teaching. *International Journal of Artificial Intelligence in Education*, 24(4), 470–497.
- Holmes, W., Bialik, M., & Fadel, C. (2021). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.
- Khan Academy. (2024). Khanmigo: AI-powered tutor and teaching assistant. Retrieved from <https://khanacademy.org>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson.
- Ministry of National Education. (2023). *2023–2027 Strategic Plan*. MEB Publications.
- Nitko, A. J., & Brookhart, S. M. (2014). *Educational assessment of students* (7th ed.). Pearson.
- OECD. (2021). *AI in education: Trends and policy recommendations*. OECD Publishing.
- Popenici, S., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. *Research and Practice in Technology Enhanced Learning*, 12(1), 1–13.
- Pritchard, D., Lee, K., & Bao, L. (2020). Using Gradescope to improve assessment efficiency and consistency in science education. *Journal of Science Education and Technology*, 29(2), 123–135.
- Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.
- Shermis, M. D., & Burstein, J. (2013). *Handbook of automated essay evaluation: Current applications and new directions*. Routledge.

Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 46(5), 30–40.

UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO Publishing.

Wainer, H. (2000). *Computerized adaptive testing: A primer* (2nd ed.). Lawrence Erlbaum.

ABOUT THE AUTHORS

Hakan DAĞLI is a Science Teacher at the Ministry of National Education Measurement and Evaluation Center in Konya, Türkiye. He holds a master's degree in Science Education and is currently pursuing his PhD in Science Education. His professional work focuses on large-scale assessment practices, test development, item analysis and data-driven measurement and evaluation processes aligned with national curricula. His academic interests include artificial intelligence applications in education, technology-enhanced assessment systems, learning analytics and AI-supported flipped learning approaches in science instruction. He has taken part in several institutional projects related to student performance monitoring, digital assessment tool development and data-informed decision-making within the Ministry of National Education, and he continues to conduct research and develop publications on AI-assisted measurement and evaluation processes as part of his doctoral studies.

Osman ÇARDAK holds the title of Professor in Science Education and serves as the Head of the Department of Science Education. He has long-standing academic experience in teacher education, science teaching and curriculum development. His research interests include conceptual change in science education, the identification and remediation of students' misconceptions, inquiry-based learning, laboratory practices, argumentation processes in science classrooms, nature and environmental education, and the development of students' scientific process skills. He has supervised numerous master's and doctoral theses and has published articles, book chapters and conference papers at national and international levels. In addition, he has served as a principal investigator and researcher in various projects aimed at improving the quality of science teaching, developing instructional materials and integrating contemporary instructional approaches into science curricula.

Similarity Index

The similarity index obtained from the plagiarism software for this book chapter is 11%.

To Cite This Chapter:

Dağlı, H. & Çardak, O. (2025). The use of artificial intelligence in educational measurement and evaluation processes: Opportunities, limitations and future perspectives. In S. A. Kiray & N. Küçükgençay (Eds.), *Current studies on artificial intelligence in education* (pp. 102-115). ISRES Publishing.