

ASSESSMENT IN THE AGE OF ARTIFICIAL INTELLIGENCE: CHALLENGES, POSSIBILITIES, AND ETHICS

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Abstract

The widespread adoption of generative artificial intelligence has brought about profound changes in educational practices, particularly in assessment processes traditionally based on content reproduction and the individual verification of learning. As students and teachers increasingly use these technologies, questions have arisen concerning authorship, originality, academic integrity, and the very purposes of school assessment. This study aims to discuss the challenges, possibilities, and ethical implications of assessment in educational contexts permeated by artificial intelligence, reflecting on the need to redefine assessment practices in basic education. Methodologically, this is a bibliographic and documentary study grounded in research on learning assessment, educational technologies, and artificial intelligence applied to education. The findings indicate that AI, when used critically and with appropriate pedagogical guidance, can contribute to more formative, personalized, and process-oriented assessment practices without replacing teacher mediation and professional judgment. It is concluded that the challenges posed by artificial intelligence do not point to a weakening of assessment but rather to the need to reconstruct its objectives, methods, and criteria in light of new forms of knowledge production within digital culture.

Keywords: Artificial intelligence, Basic education, Digital ethics, Learning assessment, Teacher education.

INTRODUCTION

Few topics have caused as much concern in contemporary school life as the relationship between artificial intelligence and learning assessment. Since the widespread adoption of generative tools capable of producing texts, solving mathematical problems, writing computer code, and answering complex questions in natural language, teachers and educational institutions have begun to question the validity of the instruments traditionally used to assess student learning. Take-home assignments, essays, exercise lists, and school research projects now coexist with the possibility that intelligent systems may produce

them in whole or in part, shifting the pedagogical debate from the mere verification of authorship to the very purpose of school assessment.

Although concerns about the misuse of technology are not new, artificial intelligence introduces a new element into this landscape: the ability to produce original, coherent, and contextualized responses within seconds, approximating tasks historically associated with human intellectual work. The ease of access to these tools means that the debate over prohibiting or permitting their use has become increasingly insufficient, requiring broader reflection on the competencies we seek to develop and the criteria used to recognize them in assessment processes.

In this context, learning assessment ceases to function merely as a mechanism for measuring assimilated content and assumes an even more important role in understanding cognitive processes, the strategies employed by students, and the progressive construction of knowledge. As Jussara Hoffmann observes, assessment does not mean classifying or selecting individuals, but understanding their learning pathways and providing the conditions necessary for learning to continue.

According to Hoffmann (2018, p. 17): “Assessment means monitoring the process of knowledge construction, providing learners with opportunities to reflect on the world and the reality in which they are situated.”

This understanding is particularly relevant in view of the challenges posed by artificial intelligence, as it shifts the focus of assessment from the final product to the pathways, strategies, and processes mobilized by students during learning.

Cipriano Carlos Luckesi’s contributions follow the same direction in advocating the transcendence of what the author calls classificatory or punitive assessment. According to Luckesi (2011, p. 28): “School learning assessment must be a loving, welcoming, inclusive, and dynamic act.”

Although formulated before the emergence of artificial intelligence, the author’s statement remains relevant because it reinforces the need for assessment practices committed to student development rather than merely to the certification of performance.

At the same time, the expansion of AI requires schools to revisit conceptions historically associated with authorship, originality, and intellectual production. In a context in which students can use intelligent systems to draft texts, organize arguments, or synthesize information, the mere reproduction of content is likely to lose its value progressively as an indicator of learning. Issues involving critical analysis, argumentation, creativity, problem-solving, and the ability to mobilize knowledge in complex situations are becoming increasingly significant in assessment processes.

This discussion is closely aligned with Philippe Perrenoud's reflections on competency-based assessment. For the author, assessment entails determining a student's ability to mobilize knowledge in concrete situations, rather than merely reproduce information previously committed to memory. According to Perrenoud (1999, p. 53): "Assessing competencies means observing students as they engage in complex tasks that require decision-making, interpretation, and the mobilization of diverse resources."

This perspective appears to engage directly with the challenges that artificial intelligence poses to contemporary education.

At the same time, international organizations have emphasized the need to establish ethical guidelines capable of directing the use of artificial intelligence in education systems. The United Nations Educational, Scientific and Cultural Organization (UNESCO) stresses that the use of these technologies must be grounded in principles of transparency, accountability, inclusion, and human oversight, preventing algorithms from reproducing inequalities or undermining the autonomy of those involved in educational processes.

Rather than debating whether artificial intelligence should be present in schools, it appears necessary to understand how it can contribute to more formative and reflective assessment practices aligned with the competencies required by contemporary society. After all, if machines can reproduce previously known answers, education may need to focus its efforts on what remains essentially human: interpreting, arguing, creating, problematizing, and assigning meaning to available information.

Given this context, the present study aims to discuss the challenges, possibilities, and ethical implications of learning assessment in the age of artificial intelligence, reflecting on the need to redefine assessment practices in basic education. Specifically, it seeks to analyze the transformations brought about by AI in assessment processes, discuss the pedagogical potential of these tools, and critically examine the ethical challenges arising from their incorporation into everyday school life.

Methodologically, this is a qualitative, exploratory bibliographic and documentary study grounded in national and international scientific publications concerning learning assessment, digital technologies, and artificial intelligence applied to education. Classical works in educational assessment, documents produced by international organizations, and recent studies on artificial intelligence and education were analyzed in order to identify convergences, tensions, and emerging possibilities for contemporary assessment processes.

To this end, the text is organized into four sections, in addition to this introduction and the final considerations. First, it discusses the relationship between artificial intelligence and the transformation of assessment practices. It then analyzes the pedagogical potential of AI for learning assessment. Next, it critically examines the ethical challenges associated with authorship, plagiarism, algorithmic bias, and the transparency of assessment processes mediated by intelligent technologies. Finally, it presents reflections on the possibilities for developing more formative, critical, and humanized assessment practices in the context of digital culture.

ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF ASSESSMENT PRACTICES

Historically, education systems have structured their assessment processes around determining students' ability to recall, reproduce, and apply previously taught content. For decades, written examinations, individual exercises, and written assignments occupied a central position in the certification of learning, serving as instruments for measuring academic performance and classifying

students according to different levels of proficiency. Strongly influenced by the demands of mass schooling and the administrative needs of education systems, this model favored assessment practices centered on the final product and the production of answers considered either correct or incorrect.

However, the expansion of digital technologies and, more recently, generative artificial intelligence has called into question some of the assumptions underpinning these assessment models throughout the twentieth century. When computer systems can produce essays, solve exercises, write code, and answer complex questions within seconds, merely examining the final product no longer provides sufficient evidence of the learning students have actually achieved. The contemporary challenge is no longer simply to determine whether an answer is correct; it now involves understanding the cognitive, argumentative, and creative processes mobilized in producing it.

This transformation does not, however, mean the disappearance of assessment, but rather the need to redefine it. As Jussara Hoffmann argues, assessment must be understood as an ongoing process of pedagogical inquiry capable of providing relevant information to guide teachers' interventions and foster student development. According to the author, assessment must move beyond a classificatory logic and assume an investigative, process-oriented, and formative character.

In this regard, Hoffmann states:

Assessment entails monitoring, understanding, and interpreting students' manifestations throughout the educational process. Teachers who assess through mediation seek to understand the strategies used by students, their hypotheses, their progress, and their difficulties, using this information to reorganize teaching and create new learning opportunities. (Hoffmann, 2014, p. 24).

The emphasis placed on processes rather than solely on outcomes becomes even more relevant in view of the challenges introduced by artificial intelligence. In a context in which algorithmic systems can produce technically correct answers, limiting assessment to the verification of the final answer is insufficient. Greater attention must therefore be paid to the pathways followed by students, the strategies they employ, and the competencies they effectively mobilize while completing activities.

Similarly, Cipriano Carlos Luckesi argues that assessment must assume a diagnostic and formative character, guiding pedagogical decisions and contributing to improved learning. From this perspective, error is no longer understood as failure or inability, but instead becomes an important indicator of the cognitive pathways followed by students.

In discussing the pedagogical function of assessment, Luckesi states:

Learning assessment is not intended to approve or fail students, but to diagnose their learning situation in order to determine the pedagogical decisions required for them to progress in their development. Assessment entails welcoming learners in their current situation and helping them move toward the objectives proposed by the educational process. (Luckesi, 2011, p. 172).

Understanding assessment as an instrument for monitoring and pedagogical intervention takes on new meaning in light of the possibilities offered by generative artificial intelligence. Paradoxically, the presence of these technologies may help move beyond models excessively centered on memorization and content reproduction, shifting attention toward competencies related to interpretation, creativity, argumentation, and the resolution of complex problems.

In this context, issues such as authorship, critical thinking, and argumentative ability are becoming increasingly important in assessment processes. Rather than asking only “What was the answer?,” assessment is progressively becoming concerned with “How did the student arrive at it?,” “What strategies were used?,” “How did the student select and validate the available information?,” and “How were different forms of knowledge articulated to solve a particular problem?”

This shift is closely aligned with Philippe Perrenoud’s discussions of competency-based assessment. According to the author, contemporary assessment processes should focus less on the mere reproduction of content and more on the ability to mobilize knowledge in complex, contextualized situations.

According to Perrenoud:

Assessing competencies means observing students as they engage in complex tasks requiring the mobilization of knowledge, decision-making, analytical ability, and the transfer of knowledge to new situations. It is no longer a matter of determining what students can repeat, but what they can do with what they have learned. (Perrenoud, 1999, p. 53).

The presence of artificial intelligence makes this reflection even more pertinent. If machines are already capable of locating information and producing standardized responses with a high degree of efficiency, schools appear to be called upon to invest in distinctly human dimensions of learning, such as creativity, ethics, sensitivity, argumentation, and the capacity to assign meaning to available information.

In discussing the impact of artificial intelligence on education, UNESCO warns that education systems will need to revise not only their curricula but also their assessment models so that they encompass competencies compatible with new technological and social contexts.

In this regard, the organization emphasizes:

Education systems will need to adapt their assessment methods to encompass competencies such as critical thinking, creativity, collaboration, and problem-solving, which remain essentially human and complementary to the capabilities of artificial intelligence systems. (UNESCO, 2023, p. 12).

Thus, the emergence of generative artificial intelligence does not represent the end of school assessment; rather, it constitutes an important opportunity to review practices historically centered on reproduction and memorization. Instead of merely measuring what students can recall, assessment in the age of artificial intelligence appears to be called upon to understand what they can interpret, construct, problematize, and transform based on the knowledge available to them.

PEDAGOGICAL POSSIBILITIES OF ARTIFICIAL INTELLIGENCE IN ASSESSMENT PROCESSES

Although much of the discussion surrounding artificial intelligence and education is associated with risks involving plagiarism or authorship, generative technologies also offer significant possibilities

for developing assessment practices that are more formative, personalized, and centered on learning processes. When used critically and with appropriate pedagogical guidance, these tools can help expand the capacity to monitor students and facilitate more timely and contextualized interventions.

One of the most evident contributions concerns the production of personalized feedback. In education systems characterized by large classes and heavy administrative demands, teachers do not always have sufficient time to provide detailed, individualized feedback to every student. Artificial intelligence can assist in preparing initial feedback, allowing teachers to concentrate their efforts on pedagogical mediation and the interpretation of learning pathways.

This perspective is closely aligned with Jussara Hoffmann's conceptions of mediating assessment, according to which feedback constitutes a central element of assessment processes. According to the author: "Mediating assessment presupposes dialogue, reflection, and ongoing pedagogical intervention" (Hoffmann, 2018, p. 36).

From this standpoint, technology does not replace teachers' pedagogical judgment; rather, it expands their capacity for monitoring and intervention.

Another important possibility concerns the development of clearer and more transparent rubrics and assessment criteria. Using appropriately structured prompts, AI systems can assist in constructing assessment frameworks, performance descriptors, and criteria related to the competencies and skills established in school curricula.

This resource is particularly relevant in view of contemporary discussions surrounding competency-based assessment. As Philippe Perrenoud argues: "A competency is not limited to an isolated body of knowledge, but consists of the ability to mobilize different resources in complex situations" (Perrenoud, 1999, p. 30).

Developing assessment instruments aligned with this perspective requires more sophisticated criteria than those traditionally used in assessments centered on memorization and content reproduction.

Artificial intelligence also has considerable potential to personalize assessment pathways. Students with different learning paces, styles, and needs can benefit from differentiated activities, gradually increasing levels of complexity, and tasks adapted to their particular characteristics. This possibility is especially relevant in inclusive contexts and in classes characterized by heterogeneity.

In this respect, the use of AI is closely aligned with José Moran's discussions of personalized learning and the need for more flexible, student-centered educational pathways. According to Moran (2018, p. 9): "Each student learns at a different pace, at different times, and in different ways, requiring more diverse and personalized pedagogical approaches."

Artificial intelligence can make a significant contribution to this diversification, provided that it remains subordinate to pedagogical decisions and to the educational objectives established by the teacher.

Another promising aspect concerns the development of metacognition and self-assessment. Generative tools can help students review written work, identify argumentative inconsistencies, reflect on their learning processes, and establish goals for improvement. Assessment thus ceases to be exclusively an external act performed by the teacher and begins to incorporate processes of self-regulation and reflection undertaken by the students themselves.

This perspective is supported by Cipriano Carlos Luckesi's propositions, according to which assessment should contribute to individuals' intellectual autonomy and awareness of their own learning processes.

Rather than providing ready-made answers, artificial intelligence can be used to encourage questions, hypotheses, comparisons, and revisions, thereby fostering students' intellectual autonomy and investigative disposition.

All these possibilities, however, depend directly on the quality of the pedagogical mediation provided by the teacher. The educational value of artificial intelligence does not lie in automating assessment processes, but in its capacity to free time and energy for what remains essentially human:

listening, interpreting, engaging in dialogue, and constructing shared meanings throughout the educational process.

ETHICAL CHALLENGES AND IMPLICATIONS FOR CONTEMPORARY ASSESSMENT

While the pedagogical possibilities offered by artificial intelligence are numerous, the ethical challenges arising from its use in school contexts are equally complex. Issues involving authorship, academic integrity, data privacy, and algorithmic bias have assumed a central position in contemporary educational debates and require increasingly consistent institutional and pedagogical responses.

One of the most recurrent concerns is the difficulty of defining the boundaries between human authorship and production assisted by artificial intelligence. School assignments, essays, and research projects produced with the support of generative systems challenge traditional conceptions of originality and require a review of the criteria used to assess learning.

However, the central problem may not lie in the use of technology itself, but rather in the persistence of assessment models excessively centered on the final product and content reproduction. If an activity can be completed in its entirety by an artificial intelligence system without undermining its assessment criteria, it may be necessary to question not only the technology, but also the pedagogical design of the task itself.

This discussion is closely aligned with Neil Selwyn's reflections, according to which educational technologies should not be analyzed in isolation, but in conjunction with the social, political, and pedagogical contexts in which they are introduced. According to the author: "Educational technology is always shaped by values, interests, and power relations" (Selwyn, 2017, p. 21).

From this perspective, artificial intelligence does not create the problems of contemporary assessment; rather, it makes weaknesses already present in traditional assessment models more visible.

Another important challenge involves the biases embedded in artificial intelligence systems. Generative models are trained on vast quantities of data produced within specific cultural and linguistic

contexts and may therefore reproduce stereotypes, render certain social groups invisible, and reinforce historically constituted inequalities.

The contributions of Emily M. Bender are particularly relevant to this debate. In discussing the risks associated with large language models, the authors warn of these systems' tendency to reproduce prejudices and discriminatory patterns contained in the datasets used during their training.

Likewise, international organizations have drawn attention to the need for continuous human oversight in decision-making processes supported by artificial intelligence. UNESCO emphasizes that “ultimate responsibility for educational decisions must remain under human control” (UNESCO, 2023, p. 9).

This guidance has particularly significant implications for assessment processes, since decisions concerning performance, progression, and educational trajectories cannot be delegated exclusively to algorithmic systems.

Issues involving privacy and data protection also warrant particular attention. Many artificial intelligence tools operate by collecting and processing large quantities of personal information, requiring safeguards consistent with current legislation and institutional data-protection policies.

In the Brazilian context, these concerns are directly related to the principles established by the Brazilian General Data Protection Law (Lei Geral de Proteção de Dados—LGPD), reinforcing the need for the responsible and transparent use of educational technologies.

More than a technical or legal challenge, this is an ethical matter involving the rights to privacy, autonomy, and protection of the individuals participating in educational processes.

FINAL CONSIDERATIONS

The expansion of generative artificial intelligence has had significant effects on the ways in which teaching, learning, and assessment take place in contemporary education. While assessment systems were strongly associated for decades with content reproduction and the individual verification of learning, the

emergence of tools capable of producing texts, solving problems, and generating complex answers requires a review of some of the assumptions that have historically underpinned these practices.

Throughout this study, an attempt was made to discuss the challenges, possibilities, and ethical implications of assessment in educational contexts permeated by artificial intelligence. The analyses indicate that the presence of these technologies does not make assessment processes unviable; rather, it highlights the need to shift the focus of assessment from the final product to the pathways, strategies, and competencies mobilized by students during learning.

In this context, assessment practices centered exclusively on memorization or the reproduction of information are likely to progressively lose their capacity to demonstrate meaningful learning. Conversely, approaches concerned with problem-solving, argumentation, creativity, critical reflection, and the mobilization of knowledge in complex, contextualized situations are becoming increasingly relevant.

Likewise, it was found that artificial intelligence can contribute to the development of more formative, personalized, and inclusive assessments by facilitating more frequent feedback, differentiated pathways, and closer monitoring of learning processes. These possibilities, however, depend directly on pedagogical intentionality and teacher mediation.

The literature analyzed also demonstrates that the most significant challenges associated with artificial intelligence are not exclusively technological, but ethical and pedagogical. Issues involving authorship, academic integrity, algorithmic transparency, and data protection require clear institutional positions and appropriate training for education professionals.

Finally, it is understood that assessment in the age of artificial intelligence does not require fewer teachers, but teachers who are even better prepared to interpret contexts, problematize information, construct criteria, and assign meaning to learning. In a world in which machines are becoming increasingly efficient at producing answers, perhaps the school's principal contribution will continue to be the education of individuals who are capable of formulating relevant questions, exercising critical thinking, and using technology in an ethical, responsible, and humanized manner.

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