

## HOW AI IS INFLUENCING THE ASSESSMENT OF STUDENTS IN PHYSICS

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**Intorduction:** Artificial Intelligence, or AI, is a very popular topic today. Many people think AI is only about robots, but it is actually in our smartphones and computers too. For example, when you use Google Maps or talk to Chatgpt, you are using AI. There are many good things about AI. First, it makes our life easier. It can find information very fast and help us with our homework or work. Second, AI can do boring tasks for us. This gives humans more time to do creative things. However, some people are worried about AI. They think that robots will take our jobs in the future. Also, some students use AI too much and stop thinking for themselves. This is a problem because we need to keep our brains active. In our opinion, AI is a great invention. It is like a powerful tool, such as a car or a computer. If we use it in a smart way, it will help us build a better world. We should not be afraid of it, but we must learn how to use it correctly.

Artificial Intelligence is changing the way students are assessed in physics by making evaluation more flexible, detailed, and learner-centered. Traditional assessment in physics usually includes written exams, numerical tasks, laboratory reports, and oral explanations. These methods remain valuable, but they do not always capture how students think through a problem. Recent guidance from UNESCO and OECD's work on assessment both support the idea that AI can reshape educational assessment by expanding what can be measured and how feedback is given.

One important influence of AI is the improvement of **formative assessment**. In physics, students often struggle with concepts, formulas, units, and the interpretation of graphs or experiments. AI-based tools can detect patterns in these mistakes and respond immediately with hints or corrective feedback. This makes assessment more useful for learning because it helps students improve during the learning process, not only after receiving a final mark. Research on AI in science education shows that AI tools are increasingly used to support ongoing learning and evaluation in science-related subjects.

AI also supports **adaptive assessment** in physics. Not all students face the same difficulties: one learner may have trouble with mechanics, another with electricity, and another with experimental reasoning. AI systems can analyze these differences and adjust the level or type of tasks accordingly. This allows assessment to become more individualized and helps teachers identify specific learning gaps more efficiently. OECD's assessment work and recent reviews in science education both point to the growing role of AI in creating more responsive and skills-based approaches to assessment.

Another major contribution is that AI can place greater emphasis on the **reasoning process**. In physics, reaching the correct answer is important, but the process of selecting principles, applying equations, and explaining results is equally important. Some AI-supported systems can analyze intermediate steps in problem solving, which gives a fuller picture of student understanding. This is especially valuable in physics because students may arrive at a correct answer by memorization or guessing without truly understanding the concept. Studies on AI in physics problem solving suggest that AI can be useful for supporting learning, while also showing that reasoning-intensive tasks remain challenging for current systems.

AI is also influencing assessment through **digital labs, simulations, and chatbot-based learning environments**. In modern physics classrooms, students increasingly interact with virtual

experiments and AI-supported study tools. These technologies can generate data about how students approach inquiry, solve problems, and respond to misconceptions. A recent study on chatbot conversations in physics education, for example, examined how interaction data could be used to identify misconceptions in a university physics course.

Despite these advantages, AI in physics assessment still has limitations. Current systems can support routine or structured tasks, but they are less reliable on complex problems that require spatial reasoning, visual interpretation, or deep conceptual integration. This means AI should not be treated as a fully independent assessor. Instead, it works best as a support tool that helps teachers provide faster feedback and better-targeted instruction. Recent research on AI performance in physics problem solving highlights both its promise and its current weaknesses in advanced reasoning tasks.

There are also ethical and practical concerns. UNESCO emphasizes that AI in education should be used with attention to transparency, fairness, and human oversight. In addition, unequal access to technology may create gaps between students who can benefit from AI tools and those who cannot. For this reason, the use of AI in physics assessment should remain balanced, responsible, and guided by teachers.

In conclusion, AI is influencing the assessment of students in physics by making it more adaptive, process-oriented, and continuous. It helps teachers track misconceptions, personalize tasks, and evaluate not only answers but also reasoning. At the same time, its limitations show that human judgment is still essential. When used carefully, AI can strengthen physics assessment and make it more meaningful for student learning.

### References

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