

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE SCIENTIFIC PROCESS

The world of technology is constantly changing, and things that once seemed impossible are now part of everyday life. Artificial intelligence (AI) has become an important tool in many areas of science. It is changing the way scientists collect, analyze, and understand data. The development of AI technologies allows researchers to solve complex problems faster and more effectively than before. Because of this, the scientific process is becoming more efficient and productive.

One of the main advantages of AI in science is its ability to work with large amounts of data. Modern scientific research often produces huge datasets that are difficult for people to analyze by themselves. AI systems can quickly find patterns, connections, and trends in this data by using machine learning algorithms and neural networks. These technologies allow computers to learn from data and make predictions without being explicitly programmed. For example, AI models such as AlphaFold have successfully predicted protein structures, which is a major breakthrough in biology. Similarly, AI is widely used in climate modeling to analyze environmental data and forecast future changes. This helps scientists make discoveries and develop new ideas more easily. Often, AI can study information faster than humans and notice details that might otherwise be missed [1; 2].

AI is already used in many scientific fields. In medicine, it helps scientists develop new medicines, analyze medical images, and predict possible health risks. For example, AI can assist in drug discovery by identifying potential chemical compounds more quickly than traditional methods. It is also used in analyzing X-rays and MRI scans to detect diseases such as cancer at early stages. In addition, AI systems can predict patient outcomes by analyzing medical histories and large clinical datasets. In physics and astronomy, researchers use AI to study experimental results and identify unusual events in space data. Besides this, environmental scientists rely on AI to study climate change, observe ecosystems, and predict natural disasters. AI technologies are also widely used in chemistry, biology, and engineering to simulate experiments and test scientific ideas.

Artificial intelligence has also influenced education in universities and the way students study and conduct research. Many universities have started using AI-based tools to support both students and teachers. These technologies make it easier for students to find information, organize their work, and understand difficult topics. At the same time, teachers can improve the learning process and provide more support to students [4].

AI can be especially helpful for students during their studies. For example, AI tools can assist students in searching for academic materials, summarizing long texts, and explaining complicated concepts. This allows students to study more efficiently and spend more time focusing on understanding the subject more deeply. AI can also

help professors organize course materials and better track how students are progressing in their studies.

Another important role of AI in universities is supporting scientific research. Researchers can use AI tools to analyze experimental results, study large amounts of scientific information, and find useful data for their projects. This makes the research process faster and allows scientists to focus more on new ideas and discoveries. However, one important limitation of AI in science is the so-called “black box” problem. Many AI models, especially deep neural networks, are highly complex, which makes it difficult for scientists to fully understand how a particular result was obtained. This lack of interpretability can be problematic, as scientific research requires transparency and clear explanations of results.

However, the use of AI in universities also raises some concerns. Some teachers worry that students might rely too much on AI when writing essays or completing assignments. It is important to distinguish between AI as a helpful assistant and AI as a content creator. For example, using AI to search for sources or explain complex ideas can support learning, while using AI to generate full assignments may be considered a form of academic dishonesty or plagiarism. In addition, AI-generated information may sometimes contain mistakes or biased results. Because of this, many universities are developing rules and recommendations to ensure that AI is used responsibly in academic work [4].

Despite these challenges, artificial intelligence has the potential to improve higher education. It can make learning more accessible, interactive, and effective. When used properly, AI can support both students and researchers, helping universities adapt to the rapidly changing technological world.

In conclusion, artificial intelligence is transforming the scientific process by helping researchers work faster and analyze data more effectively. It allows scientists to work with complex information and opens new opportunities for scientific progress. Even though AI cannot replace human creativity and critical thinking, it is becoming a powerful tool that helps scientists make new discoveries in many fields.

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