What is artificial intelligence and what is it not?

Debunking misconceptions

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Learning goal

On 30 November 2022, OpenAI, an American artificial intelligence research company, introduced ChatGPT, which quickly became the world's best-known generative artificial intelligence (AI) application. Trying it out required only a simple registration, and the service's popularity grew at an unprecedented pace: it reached one million users in just five days.

Questions asked in users' own languages received fast and surprisingly relevant answers, as if the "conversation" were taking place not with a machine, but with another human being.

In this learning material, we trace the historical origins of the term "artificial intelligence" and examine how early media hype contributed to the emergence of misconceptions that persist to this day, such as the idea that if a machine responds in a human-like way, it must also think in a human-like way.

The learning material encourages educators to use these tools critically and responsibly in their pedagogical work, while being aware of both their possibilities and their limitations.

Why is the term "artificial intelligence" misleading?

Artificial intelligence as a new scientific discipline

In 1955, prominent scientists prepared a proposal to introduce a new field of research focused on simulating human cognitive abilities using computers.

> „Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." (McCarthy, J., Minsky, M., Rochester, N., & Shannon, C. (1955). A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence.

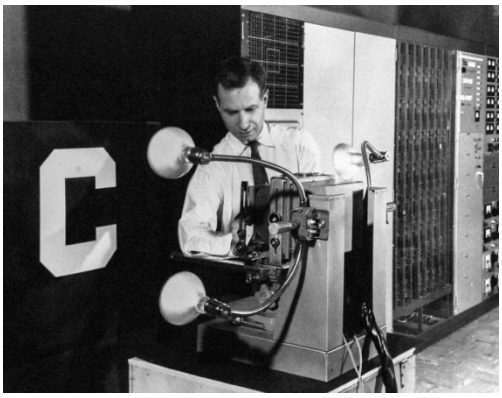
The research officially began in 1956 at a conference held at Dartmouth College (USA), and the new discipline was named "Artificial Intelligence" at the suggestion of John McCarthy[1].

[1] John McCarthy, American computer scientist and cognitive scientist (1927–2011)



Dartmouth College (Source: Wikipedia)

The choice of name was already accompanied by controversy at that time. **Many believed that the term was scientifically inaccurate, exaggerated, and attributed too many human characteristics to machines.** At the same time, the English name (Artificial Intelligence) proved to be effective and easy to remember. Its abbreviation, "AI", spread at lightning speed, and soon new research projects were launched under this name at several universities and research institutes with state funding.



Rosenblatt and the perceptron (Wikimedia Commons)

Frank Rosenblatt, a professor at Cornell University, presented a system called the perceptron, which could recognize different letters. Rosenblatt claimed that its operation could, in some sense, be compared to that of the human brain, and he believed that one day the system might even display signs of intelligence.

The next morning, The New York Times reported that in the future the "perceptron" would be able to walk, talk, see, write, reproduce itself, and even be conscious of its own existence. The journalist was not aware of the long-term impact his article would have on misconceptions about the nature of artificial intelligence.

Common misconceptions

When we talk about artificial intelligence, we often use the same action verbs that we use to describe human actions: we say that AI is thinking, writing, or responding. This personifying use of language, known as anthropomorphism, stems partly from science fiction films and partly from everyday speech, rather than from how AI systems actually work. Anthropomorphism is still reinforced today by Hollywood films that depict artificial intelligence as self-aware beings.



Humans are thinking. AI calculates. (Source: ChatGPT 5.5)

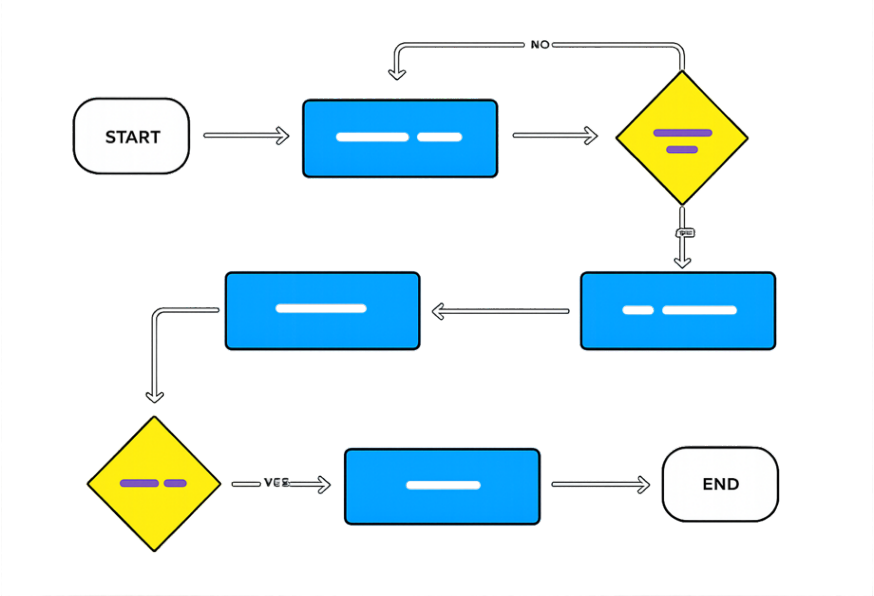
In everyday language, it has become common to say that AI learns, reads, or even creates, which gives the false impression that AI technologies are far more capable than they are currently designed to be. We can avoid common misconceptions by being aware of the limitations that AI certainly still has today:

- Today's AI systems do not possess human intelligence.
- AI does not understand the meaning of words in the human sense; it works based on patterns and relationships.
- AI has no intentions, emotions, or consciousness of its own.
- AI does not think in the human sense and does not have independent beliefs or goals.
- AI cannot reliably and independently determine whether something is true or false; its responses need to be verified.
- AI does not learn in the same way humans do: it does not live through experiences, but builds models from data, examples, and patterns.

The most frequently and widely used AI tool today is ChatGPT, and many people mistakenly think that ChatGPT is "AI itself." It is true that it was the first of its kind and is still one of the most popular, but it is only one of many thousands of AI applications, originally developed by OpenAI mainly for language tasks.

Artificial intelligence and traditional software: key differences

Traditional software operates in a strictly rule-based manner: every action and response is explicitly coded by program instructions. Such software consistently gives the same output for a given input.



How traditional software works (Source: ChatGPT 5.5)

This can be seen in everyday tools such as accounting software that applies fixed tax rules, or navigation systems that calculate routes based on predefined algorithms. Traditional software always works predictably; its functionality is limited to executing the instructions defined by the programmer.

AI systems work differently. They are built on special mathematical statistical algorithms, identify patterns in data and generate responses based on probabilities. These systems are more flexible than traditional software, but their outputs are inherently less predictable. AI can assist with complex tasks such as analysing large volumes of data; however, its results are probabilistic, meaning they may vary even when given the same input.

What is artificial intelligence?

There is no single, universally accepted definition of artificial intelligence.

Seventy years after the term was coined, we can say that the original vision of early researchers has largely become reality. Today, artificial intelligence is an umbrella term for computer systems that can imitate certain human cognitive abilities, such as recognising patterns, classifying objects, or generating text.

Their spread is unstoppable: AI systems have become embedded in everyday life – in cars, smartphones, applications, games, and online platforms – often operating invisibly, without users even being aware of their presence.

What has changed over the past seven decades?

Although many of the theoretical foundations and mathematical algorithms of today's AI systems had already been developed by the 1980s, the technological conditions needed for their practical application were not yet in place. The main obstacle was the lack of adequate computing infrastructure: there were no systems capable of storing and processing huge volumes of data, nor processors providing the necessary computing power. Only recent advances in hardware and data availability have enabled these early ideas to be fully realised.



High-performance data centre (Source: ChatGPT)

In the first decades of the 21st century, artificial intelligence is rapidly transforming economic sectors by enhancing efficiency and supporting decision-making in industries such as healthcare, finance, manufacturing, and agriculture.

- Healthcare: diagnostic imaging, patient monitoring
- Manufacturing: predictive maintenance, quality control
- Logistics: route optimization, warehouse automation
- Finance: fraud detection, algorithmic trading
- Marketing: targeted advertising, consumer analytics
- Agriculture: precision farming

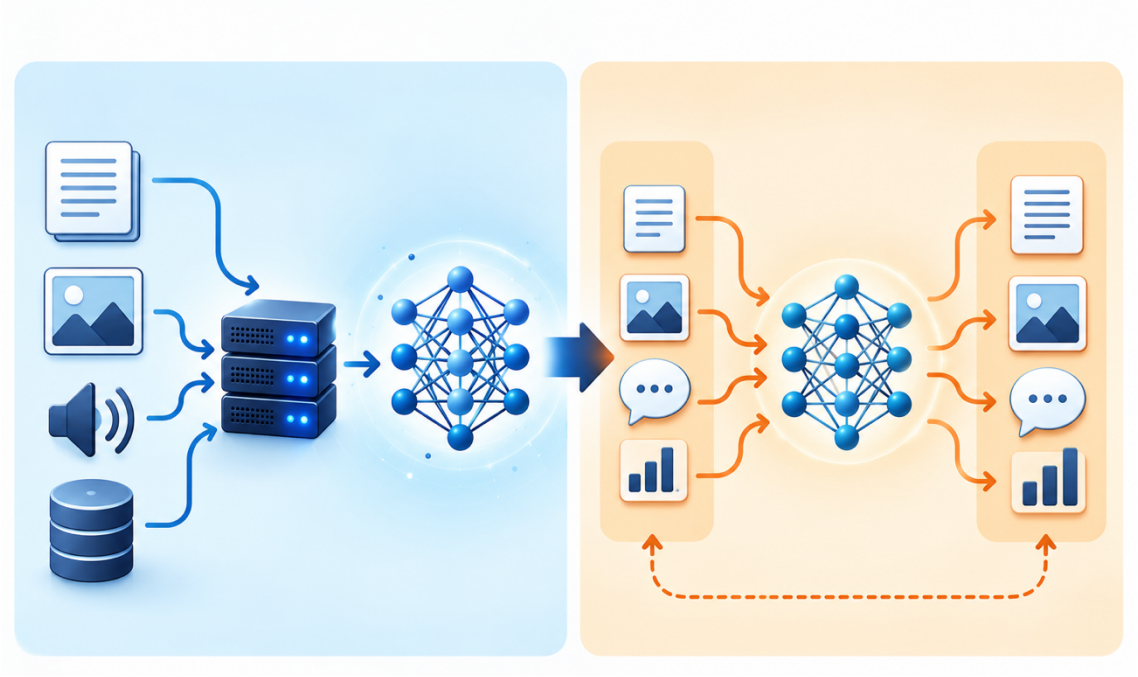


AI in different economic sectors (Source: ChatGPT 5.2)

The OECD first published its AI Principles on the development and use of artificial intelligence in 2019. The document was updated in May 2024 to reflect developments in AI technology and their social, economic, and policy impacts. It is not primarily a scientific document: it invites AI actors to develop and use the technology in a trustworthy and responsible way, while also guiding policymakers in creating appropriate AI strategies. The document also includes a general definition of artificial intelligence, which is broad enough to cover the diversity of AI systems known today (in 2026).

> An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment.

The figure attached to the definition divides the operation of AI systems into two crucial stages: the **build** phase and the **use** phase.



The build phase and the use phase of AI systems (Source: ChatGPT)

The left side of the figure illustrates the build (learning) phase: the AI system takes data from the environment, processes it according to the given objectives, and uses it to build and train the AI model.

The right side of the figure shows the use phase: the trained model receives new input, based on which it generates predictions, content, recommendations, or decisions. These outputs can influence the physical or virtual environment.

Short takeaway for teachers

Attributing human characteristics to artificial intelligence, i.e. **anthropomorphising** it, continues to this day. This is reinforced by Hollywood films, which often depict AI as beings becoming self-aware. In everyday language, it has also become natural to say that AI "learns", "reads", "thinks", or even "creates". However, these expressions can be misleading, as they may give the impression that AI understands what it is doing in the way humans do, and that it has abilities it does not actually possess.

A key responsibility of teachers is to recognise and help dispel common misconceptions about AI. They can support students in distinguishing between myth and reality and in developing a critical, well-informed understanding of the nature and capabilities of artificial intelligence.

For teachers, the most effective strategy is to adopt a balanced perspective: not to place unrealistic expectations on AI, but not to underestimate its potential either. AI does not think like a human; however, when used with a critical and responsible mindset, it can become a valuable assistant that supports both teaching and learning.

What matters most for effective AI use is not a high level of digital expertise and skills, but the willingness and ability to ask meaningful questions, critically assess AI-generated answers, understand the limitations of these systems, and harness their potential for learning, pedagogical, and other purposes.

References

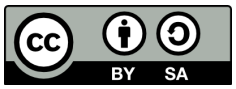
- McCarthy, J., Minsky, M., Rochester, N., & Shannon, C. (1955). A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence.
- Karen Hao (2025): Empire of AI – Dreams and Nightmares in Sam Altman's OpenAI, Penguin Press, New York

Useful links

OECD AI Principles overview, https://oecd.ai/en/ai-principles

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