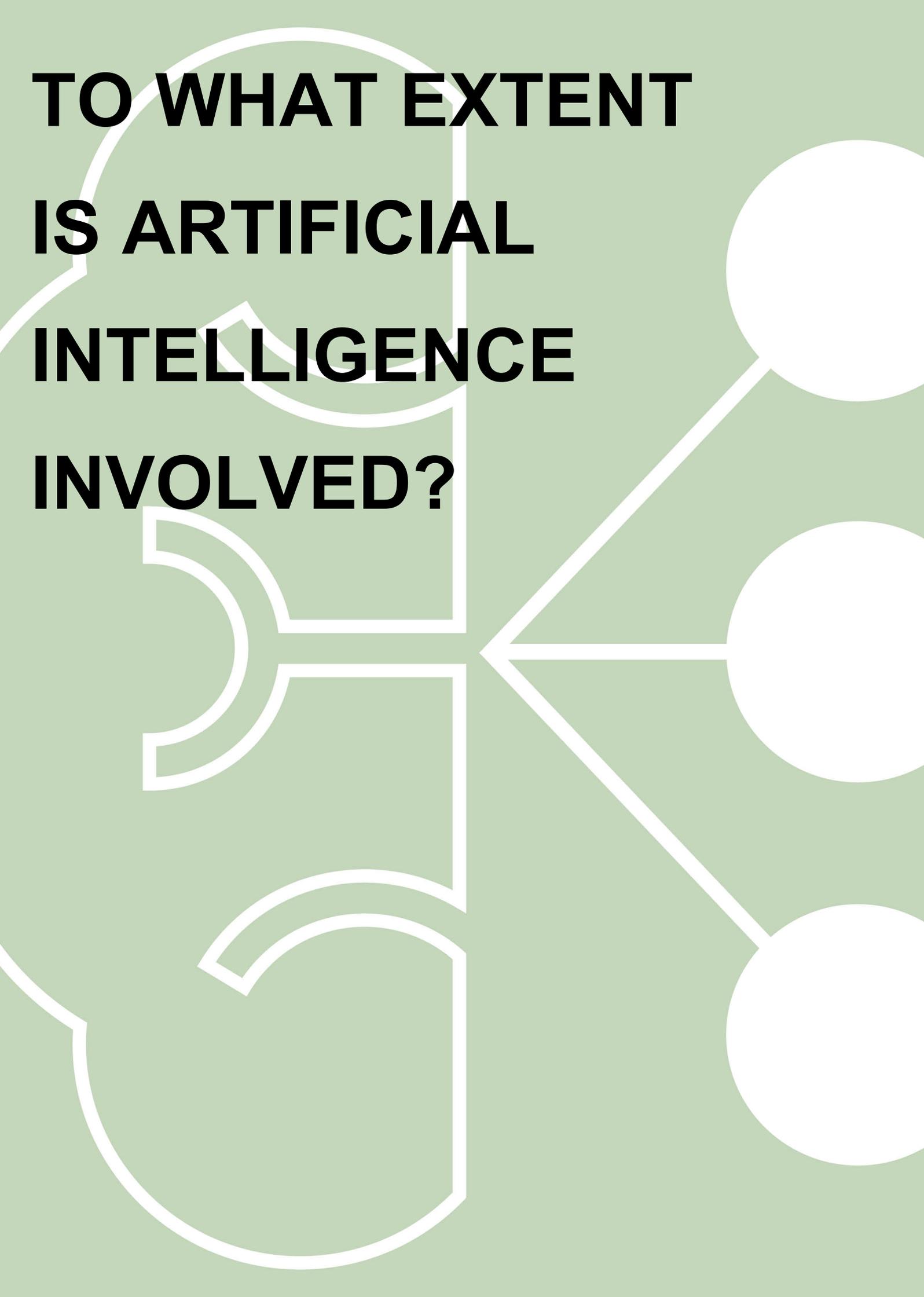


**TO WHAT EXTENT  
IS ARTIFICIAL  
INTELLIGENCE  
INVOLVED?**



# Artificial Intelligence Education

The term artificial intelligence (AI) has gained a lot of traction in recent years and is often associated with great hopes in relation to solving society's fundamental problems. Therefore, it is important to clarify a basic distinction: While the so-called "strong AI" – a machine that can think logically, make plans, learn independently and thus solve fundamental problems – is still pure fantasy, we are surrounded by "weak AI" in our daily lives. A weak AI uses complex algorithms in order to solve specific questions, for which it has priorly learned the correct solution paths. Examples include image and voice recognition, navigation systems and automatic translation. Furthermore, weak AI systems can independently learn from experience (machine learning): artificial "neural networks", for example, learn not only from data that is provided, but also from other algorithms.

## Artificial intelligence in our daily lives

The largest part of the content that we see online is based on algorithms that automatically select the "relevant" content out of the masses. This selection takes place on the basis of programmed specifications and is increasingly personalised – showing every internet user, for example, different search results and different prices online. Moreover, this process allows for the so-called micro-targeting: a type of marketing that enables advertisers to show each user individually personalised offers. This can lead to a problematic fragmentation of people's living environments (for example, when a job advertisement is only shown to white and childless men between 30 and 35 years, or when every user is shown different political advertising and potentially individually personalised fake news).

Also digital learning, teaching and administrative software increasingly use artificial intelligence. On the administrative level, for example, AI is used to predict the future demand for schools, supporting decisions on where schools are being built, extended or closed down. In the classroom, "learning analytics" constitutes a popular area of implementation for artificial intelligence. Here, AI is used to track students' learning processes and "optimise" them through automatically selected personalised assignments for each student. This goal of continuous optimisation, however, should be critically questioned, as what constitutes "good" education remains highly controversial. The concepts, ideas, tools of analysis and algorithms behind digital learning systems often originate from areas such as business intelligence, marketing or precision medicine, and are being repurposed in the education sector. This leads to an altered understanding of education or "good teaching" (for example, to a compartmentalised sequence of learning performance analysis, input, feedback and diagnosis). Moreover, data are never neutral but always represent reality in a biased manner, which calls into question the adequacy of automated recommendations. Apart from that, many learning analytics systems apply behaviourist principles and support learning on the basis of simplified reward mechanisms instead of strengthening intrinsic motivation and critical thinking.

## IBM's "cognitive classrooms"

IBM is working on a particularly extensive incorporation of AI into the classroom: the development of "cognitive classrooms" and "cognitive tutors". The goal is to develop neuro-technologies that function as "cerebral augmentations to the cognitive capacities of the learner". Similar to the concept of the "smart city" and with the use of similar technologies, the idea is to entirely infuse classrooms with "intelligent" technologies, which continuously measure and analyse the learners and produce "optimised" individual learning content. These developments are based on an understanding of the brain as a "computer" – as a "programmable organ with computable cognition that could be optimized through interaction with smart environments".

## Questions

- Which role does AI play in the education software? Which decisions are made by algorithms and how much human oversight is (still) possible?
- How are the recommendations of the software created? How does the algorithm weigh the different variables?
- Which theories are underlying the software? Does it follow behaviourist principles?
- Does the algorithm screen out more complex assignments with potential for confrontation or without immediate rewards? Are such assignments still allowed for?
- How does AI reconfigure the way we think about education and learning?
- Which understanding of education / learning / good teaching is underlying the system?

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UNBLACK THE BOX is a network initiative founded in 2019 by researchers from education science, sociology, information technology, media and health education, as well as teachers in schools, universities and pedagogical training. Our goal is to enable educational institutions and teachers to respond to the growing datafication and digitization of education with enlightened, critical and conscious decision-making, even without extensive IT knowledge.

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