

## ChatGPT in Education – Let's Think Step by Step

Michael Schwarz / 2141622 / Dec. 5, 2023

Large Language Models (=LLM) like Generative Pre-trained Transformer 4 (=GPT-4) have the potential to significantly impact education as we know today. With the introduction of ChatGPT, which was offered by OpenAI for free, many people who had not interacted with conversational agents before could get first-hand experience with an advanced conversational agent. This development led to extensive discussions about the possible applications of ChatGPT in educational institutions, from primary schools to universities.

I investigate whether *the prerequisites for the use of ChatGPT in the field of education are fulfilled and which restrictions must be followed* [Q1]. In particular, *how ChatGPT can be practically integrated in educational settings for learners and lecturers* [Q2]. Furthermore, given the challenges in distinguishing between human-written and AI-generated content, the question arises *how effective current detection mechanisms are in academic writing* [Q3]. This research does not collect any new data and therefore relies on data from studies conducted by others, focusing on information that is as up-to-date as possible (until November 2023). Furthermore, I use DeepL and ChatGPT, two popular AI-tools, in this work. For transparent use of ChatGPT, the full conversation log with ChatGPT can be found at the following Zenodo repository: <https://doi.org/10.5281/zenodo.10252663>.

Results show that the use of ChatGPT in educational institutions is possible. Since the release of business accounts by OpenAI, the usage via API or ChatGPT Enterprise compliance with prerequisite like GDPR and DPA.[5] But, in schools and universities are still a number of hurdles that need to be overcome before teachers and students have equal access and receive information on consistent rules for AI tools. Likewise, the development of digital competencies among teachers is important, as their current knowledge gap can hinder students digital competence development.[6] Fortunately, there are already great training opportunities. [Q1]

Prompt competence is an important future skill, which students can practice by using ChatGPT.[1] School students require learning foundational skills and ethical awareness, which can be learned in a hands-on experience like "amazing persons" and "group puzzle" during class.[4] University students should reflect how to integrate ChatGPT into their education as a supplement.[2] Most importantly, students must inform themselves how to integrate ChatGPT in their academic work properly, to comply with guidelines and rules for AI tools. As ChatGPT excels in writing and offloads work for students, lecturers are able to ask more complex questions, which raises the general level of learning.[7] New possibilities to learn new learning materials at home with AI, will change teaching as we know it today. One idea is the concept of "flipped classroom" which focuses on an interactive application in the classroom instead of traditional frontal teaching. ChatGPT can help lectures by creating exercises and developing lecture ideas and lesson plans. Finally, assessments should be expanded by requesting students to reflect on their learning in writing or orally.[3] [Q2]

In academia, concerns arise regarding copyright and the risk of plagiarism. Text generated by ChatGPT are difficult for humans to recognize as well as current detector tools are still at an early stage or simply not reliable enough. However, projects like CheckGPT demonstrate in benchmark tests with an average recognition rate of 98%-99% accuracy that the problem is manageable but also that more research is needed in that domain.[8] [Q3]

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