

ChatGPT & School

Assessments by the Chair of "Digitalisierung und Bildung" at the University of Teacher Education Schwyz

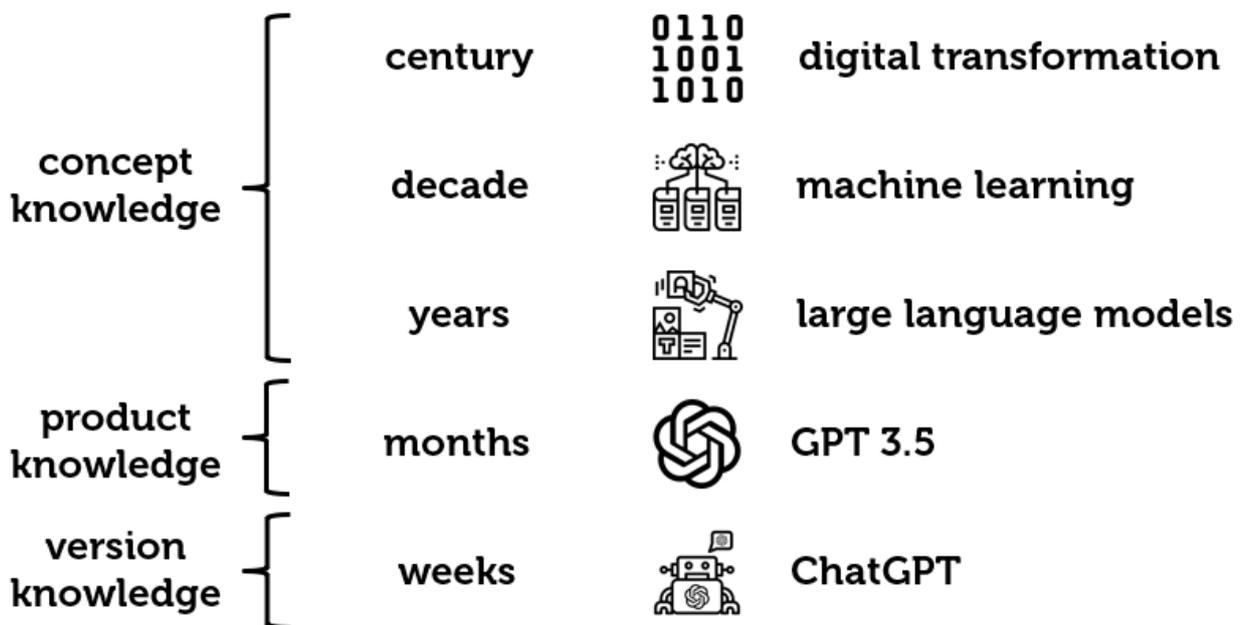
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1 What is it about?

The release of a test version of the AI chatbot ChatGPT in November 2022 has led to hype in social media and mass media. The question is also often asked what impact AI speech generators like ChatGPT will have on schools. This text provides PHSZ classifications on the topic.

2 General classification

The release of ChatGPT in November 2022 made a longer and larger development publicly visible. Comparable to the launch of the iPhone in 2007, ChatGPT did not come out of nowhere and does not have completely new and unexpected features. However, the iPhone, like ChatGPT, managed to unite and use existing or developing technologies in such a way that they became perceptible on a larger scale and are considered the beginning of a new era in each case.



Differentiation of concept, product and version knowledge in ChatGPT

When assessing ChatGPT, it is necessary to distinguish between different abstraction and associated time periods. Certain version-specific properties are valid for a few weeks, while certain fundamental aspects are not specific to ChatGPT but will be valid for years or even decades. Presumably, Roy Amara's statement that people tend to overestimate the short term and underestimate the long term also applies to ChatGPT (Biblionetz:w03364).

3 Technical perspective

- **ChatGPT is only one step in a longer development**
- **The limit of the possible is not easy to name**
- **ChatGPT is a very generic tool that focuses more on breadth than depth**
ChatGPT is a generic tool designed for broad application. It is therefore less powerful in all aspects than existing and future specialised tools.
- **ChatGPT is primarily based on a language model and is not a logic machine.**
GPT3 and co. build their answers primarily on the basis of statistically expected words and sentences whose probabilities they have found in their text corpus. It therefore sometimes happens that they generate factual and/or logical errors.
- **In the discussion, it is important to distinguish short-lived version properties from medium-term product properties and, in particular, from long-term technology properties.**
 - **Version-specific:** The version of ChatGPT available since December 2022 is a test version to improve the service. The interactions of test users flow into the service automatically and/or manually, so that ChatGPT reacts completely differently to certain requests after just one week. Thus, even statements about the actual ChatGPT service are sometimes only valid for a very limited period of time.
 - **The following points are product-specific and therefore not relevant to the discussion in the long term:**
 - **ChatGPT is based on a text corpus from 2021 and does not take the current internet into account for responses.**
However, this is an operational limitation of the developers and not a fundamental obstacle.
 - **ChatGPT currently does not cite correctly (citation style) and sometimes invents sources.**
These are both features that can be easily corrected in other products, as both the correct citation style can be automated and automated checking for the existence of sources is easily feasible.
- **AI speech robot recognition software will trigger an arms race but will not bring reliable recognition**
The development of AI-generated text recognition programmes (such as GPT-Zero) will trigger an arms race between AI text generation and AI text recognition, as AI text generation programmes will use the available recognition programmes as an additional filter / training opportunity (GAN network with recognition algorithm as discriminator). It will thus probably not be possible in the long term to reliably recognise computer-generated texts automatically.
 - **The arms race has begun**
Turnitin has announced in a [YouTube video](#) the expansion of their service to include the recognition of generated text.

4 Social perspective

In the following, only social aspects are listed that are specific to AI text generators on the one hand, and on the other hand have consequences for the school that go beyond "This should be addressed in school":

- **ChatGPT & Co. are tools that are available in life from now on and will not disappear.**
Of course, it will take some time before these tools are generally and permanently available (ChatGPT is currently only a test version that could also disappear again). In the longer term, however, it can be assumed that such tools will be (freely) available to everyone from now on.
 - **It is conceivable that ChatGPT & Co. will replace search engines as tools to some extent.**
Many beta users of ChatGPT report that they have started to use ChatGPT as a substitute for a search engine. There are also growing voices that see AI chatbots as a threat to traditional search engines and the related business model of ads between search terms. Microsoft has already announced its intention to incorporate the technology into its Bing search engine). (Sources see [Biblionetz:a01506](#))
 - **ChatGPT & Co. will be integrated into other products and platforms.**
(Microsoft has already announced its intention to adopt the technology in Office programmes).
- **ChatGPT & Co. massively simplify and cheapen the creation of text.**
This will probably have at least the following consequences (which are relevant for general education):
 - **The flood of information will increase by another order of magnitude**
(For sources and criticism see [Biblionetz:a01490](#))
 - **The tide of fake news is likely to continue to rise**
(For sources see [Biblionetz:a01493](#))
 - **Detecting fake news based on linguistic errors is likely to become more difficult**
 - **Phishing attacks are likely to be linguistically flawless and possibly extremely personalised in future**
Up to now, one could assume that most phishing attempts were linguistically rather bumpy and incorrectly formulated and rather general in content. In the future, GPT3 & Co. will enable linguistically perfect and content-adapted requests. (17.01.23 [Report from heise.de](#))

We consider the following aspects as either not school-specific or not AI language generator-specific:

- **It is unclear whether AI speech generators infringe intellectual property rights**
AI speech generators work with data obtained by offsetting digitally available documents that are subject to copyright. Even if no text passages are taken over directly, there are voices that see this unasked-for use of these documents as an infringement of intellectual property.
Regardless of the legal assessment, we do not consider this to be a school-specific issue to be resolved. Not discussing or using AI speech generators in schools on the grounds of an unresolved legal situation does not seem to us to be an effective strategy. (More on this aspect e.g. at [netzpolitik.org](#))
- **The use of current AI language generators is not possible in a data protection-compliant manner.**
The current AI language generators are only accessible cloud-based and cannot currently be installed locally or on one's own servers. The providers currently often make the AI language generators available free of charge in order to collect statistical usage data. It can therefore be assumed that usage data is collected that is not compliant with the respective locally applicable data protection regulations. The phenomenon that attractive digital services are not compliant with data protection is common in the development of the digital transformation to date and is not limited to AI speech generators. Since this discussion has been going on very intensively for a long time and we are not aware of any aspects of this discussion specific to AI speech generators, we will refrain from reopening this discussion using the example of AI speech generators.

5 Importance for schools

- **The importance of media competence increases once again**
If the general flood of information and, in particular, the scope and degree of perfection of fakenews increases by another order of magnitude due to AI text generators, then the importance of media competence also increases, which in future must also include recognising and dealing with computer-generated texts.
- ***Using AI text generators as part of information literacy***.
If AI text generators become an important tool for research and will to some extent replace or at least complement "traditional" search engines, then dealing with AI text robots must become part of general education.
- **AI text generators as a multi-perspective topic at school**
Understanding and competent use of AI text generators will be part of general education in the future. In this context - as with previous (digital) tools and media - mere application competence is not enough. Pupils should have considered the topic from the [three Dagstuhl perspectives](#):
 - **How do AI text generators work technically?**
In order to better assess the potentials and limitations of AI speech generators and to be able to use the systems effectively and efficiently, a basic understanding of how they work is necessary. It is a task of computer science didactics that has not yet been satisfactorily solved to develop and test appropriate models and teaching materials here.
 - **What is the social impact of AI text generators?**
AI text generators will affect the way we live and work. For this reason, it is necessary that students deal with social and cultural aspects of this technology.
 - **How can AI text generators be used in concrete terms?**
In order to be able to use AI text generators in everyday life, certain application skills are necessary - as with all (digital) tools and media. However, it is important not to limit the discussion of AI text generators in schools to these application skills.
- **Further increase in the level of cognitive demand**
With the availability of AI text generators, the cognitive demand level for professional and social life continues to rise. If routine mental activities can also be increasingly automated, people are confronted with the products of these automated processes on the one hand and have to deal with the resulting even more complex challenges on the other.
- **A widening skills gap?**
In the course of digitalisation so far, it has become apparent that good pupils are better able to use new (digital) tools and media for their own benefit than worse pupils. This has already led to a widening of the performance spectrum in the past. This should be no different with AI text generators. (More on the hypothesis of the digital scissors effect: [Biblionetz:w03389](#))
- **Motivation problems due to available automation?**
So far, it has not been clarified whether the availability of automated text creation and text translation results in motivational problems for pupils because they do not see any point in learning a competence that is already available in an automated way. (In a sense, this is a similar discussion to the one that has already taken place with mental arithmetic since the availability of calculators).
- **Detailed questions of integration versus prohibition of AI text generators in specific teaching situations**
Similar to the calculator, the question will also arise in the future for AI text generators in which teaching situations the use of AI text generators will be permitted or prohibited for which didactic reasons.
- **Potentials for material generation and feedback to pupils**
In principle, AI speech generators offer the potential to generate personalised teaching material and (individual) feedback for pupils. However, it is not yet clear how didactically appropriate such texts can be generated and what undesirable side effects may arise when computer systems take over certain tasks that were previously performed by teachers

(Relevant research and projects can often be found under the keywords Intelligent Tutoring System (ITS), learning analytics or adaptivity).

- **Certain examination formats will be vulnerable to cheating in the future**
Written tasks and examinations without appropriate supervision and/or countermeasures can in future be solved in part simply with AI language generators. Corresponding examples can already be found numerous on the internet.
 - **Individual questions no longer protect against possible fraud**
Before the advent of AI text generators, it was enough to formulate very individual questions instead of general ones ("Describe Napoleon's campaign from the point of view of a Russian peasant") because the answer to exactly this question was not yet available on the internet. Today's AI text generators, however, also provide answers to such questions.
 - **Plagiarism detection software massively loses importance**
Plagiarism detection software currently only recognises text passages that have been taken practically word-for-word from another source, but not texts that have been created with an AI text generator. If AI text generators are available, smart students will use them in such a way that plagiarism detection software will no longer be effective. This makes it less important.
 - **Oral exams are a possible measure against fraud with ChatGPT & Co. .**
 - **Closer supervision of pupils and students helps against the fraud of ChatGPT & Co.**
(For sources and citations see [Biblionetz:a01474](#))
 - **Process portfolios can help document the creation of works**
- **Currently available handouts are mostly only helpful in the short term**
Currently, numerous handouts are published for the use of ChatGPT in the classroom. These guides are likely to be of very short term validity due to the rapid changes in ChatGPT and the risk of termination of free availability of the service.

6 Concrete examples

- [Solution of a self-study task from the subject didactics master "Media and Computer Science \(in german\)](#)

7 Further information

- [List of AI writing tools in an open etherpad](#)
- Literature and citation lists on the subject area "computer-generated texts" in the Biblionetz by Beat Döbeli Hon-egger:
 - [Biblionetz:w02833](#) **Computer generated texts**
 - [Biblionetz:w03387](#) **ChatGPT**
 - [Biblionetz:w03164](#) **GPT-3**
 - [Biblionetz:w03388](#) **GPT-4**
 - [Biblionetz:a01483](#) **Use of text generators will soon become as commonplace as using a calculator**
 - [Biblionetz:a01490](#) **Computer-generated texts increase information overload**
 - [Biblionetz:a01493](#) **Text generators make the generation of fake news much easier**
 - [Biblionetz:a01494](#) **Text generators make it easier to generate bullshit**
 - [Biblionetz:a01495](#) **Text generators massively increase the validity of Brandolini's law**

8 Contact

This page (<https://mia.phsz.ch/MIA/ChatGPT>) was created in the environment of the professorship "Digitalisation and Education". Comments and suggestions are welcome: beat.doebeli@phsz.ch