

Adaptiv

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# Impact of Large Language Models on Education

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# Introduction

What you can expect to learn in this paper

As artificial intelligence (AI) and machine learning continue to advance, content creators and even educators have started exploring large language models, in particular, and their potential to revolutionize the way we learn and teach.

Large language models allow educators to offer personalized and adaptive learning experiences and automate content creation and assessment. There are many potential benefits to incorporating language models in education. By carefully considering the use of this technology, educators can effectively leverage the unique capabilities of language models to enhance the learning experience for their students.

In this paper, we will explore the impact of large language models on education, and how educators can leverage this technology to become the superhumans in this brave new world.

# Teachers : super humans in a brave new world

Teachers have always been the heroes of the classroom, but imagine a world where they are enabled to go beyond their current responsibilities of planning and delivering lessons. In a world where language models are increasingly able to perform a wide range of tasks with high accuracy, it is easy to fall prey to the idea of the death of the educator. But it is important to remember that language models are not capable of the same level of critical thinking, creativity and emotional intelligence of a skilled teacher.

With language models working as their assistants, teachers will be able to focus on making lessons more relatable by multiplying interactions with students. Instead of fading away into oblivion, the opportunity to exercise their unique skills of knowledge transfer and empathy will allow teachers to become superhumans. To understand how this can be achieved, let's delve into the world of large language models and their impact on education.

# What are large language models?

Large language models are computer programs that are trained to predict the likelihood of a sequence of words. They are typically trained on large datasets of text and use statistical techniques to identify patterns in the data and generate text responses based on prompts.

Language models have been widely used in natural language processing tasks such as language translation, text generation, and text summarization. With the advances in machine learning and the availability of large amounts of data, language models have become increasingly powerful and are now being used to create educational materials.

# How do large language models work?

Large language models are based on the idea that certain words are more likely to follow other words in a given language, and that the likelihood of a particular word can be predicted based on the context of the words that come before it.

There are several different types of language models, but the basic idea is the same across all of them. First, the model is trained on a large dataset of text, which could be anything from a collection of news articles to a database of books. The model analyzes this data to learn the statistical patterns and relationships between words.

Once the model has been trained, it can then be used to generate text by predicting the likelihood of each word in a sequence based on the words that come before it. For example, if the model has been trained on a dataset of news articles, it might predict that the word "president" is more likely to appear after the word "the" than the word "unicorn."

To generate text, the model typically starts with a seed word or phrase and then uses its prediction capabilities to generate a sequence of words that follow. The generated text can then be fine-tuned by adjusting the input parameters or by providing additional constraints to guide the output. Language models can be trained on a large dataset of text and can learn the patterns and structure of the language. This allows them to generate text that is similar in style and content to the training data.

# Examples of large language models

One of the most well-known large language models is **GPT (Generative Pre-training Transformer)**, developed by OpenAI.

**Here's how GPT introduces itself:**

GPT stands for "Generative Pre-trained Transformer." It is a type of language model developed by OpenAI that is trained to generate human-like text. It uses a transformer neural network architecture to process input and generate output, and it is pre-trained on a large dataset of text in order to make it more effective at generating natural language. GPT can be fine-tuned for a variety of language tasks, including language translation, question answering, and text generation.

Screenshot from [chat.openai.com](https://chat.openai.com)

There are several other large language models, like Cohere which use technology to generate new content that is similar to existing content or data. Among its various services, Cohere is also developing a multilingual text understanding model that will empower content creators to break language barriers and reach a much wider audience.



# Impact of large language models on education

ChatGPT has been in the news recently for the impressive outputs based on prompts entered by users. Everyone from professional content creators to students is generating essays on the platform. Ethical concerns about student submissions are increasing and educators are sounding the alarm about the impact of this technology on student essays, with worries about attribution oversights, factual inaccuracies, and bias in assignments. But like any technology in its early stage, this will also resolve as the technology matures. Solutions that check for plagiarism and detect content generated by OpenAI already exist, and will only improve in their efficiency.

One of the key considerations when integrating GPT in education is determining how it will be used. Will it be used to supplement traditional teaching methods, or will it play a more central role in the learning process? How will it be incorporated into existing lesson plans and curriculum? How will educators deal with its limitations and potential dangers?

Answering these questions will help educators identify the best ways to leverage the unique capabilities of language models.

Large language models have great potential to make the task of lessons creation easier and more efficient, and improve access to education:

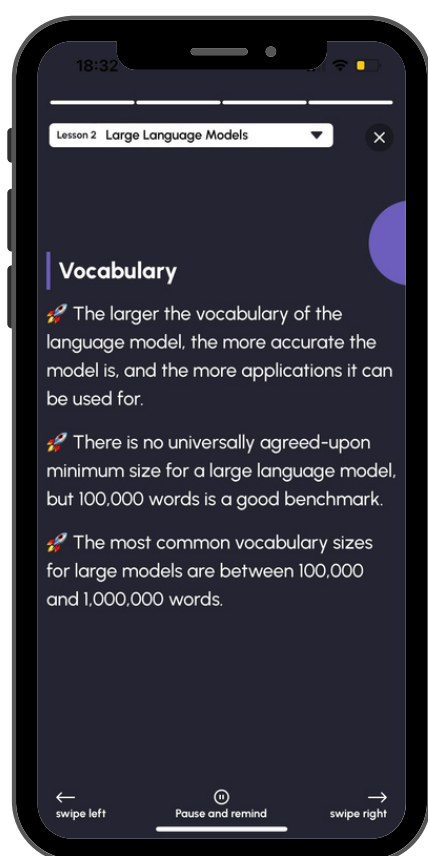
## 1. Automating creation of learning material

Language models like GPT can be trained to generate pedagogical materials, allowing teachers to save time and effort, and focus on more high-level tasks such as curriculum development and student support.

While this would require significant amounts of training data and would likely be a long-term project, the potential benefits are significant. By using GPT to generate educational materials, it may be possible to significantly reduce the cost of learning material, making education more affordable and accessible for students.

## 2. Summarizing complex concepts / textbooks:

With the increasing importance of micro-learning in L&D, large language models can play a very important role in generating summaries of complex concepts, and could help students who are struggling to grasp a concept or who need a refresher on a topic.



Screenshot from  
[adaptiv.me](https://adaptiv.me)

Automated generation of summaries could also be useful for GenZ learners, who have a limited attention span and prefer more casual and informal content. By enabling educators to quickly generate concise, easy-to-understand summaries of key concepts, large language models could help students improve their understanding and increase retention of complex concepts.

G

I'm new to NLP and GPT. Can you break down the concepts for me so I understand how this works?



Sure! Here is a high-level overview of some of the key concepts in natural language processing (NLP) and how they relate to GPT:

- NLP is a field of artificial intelligence (AI) that focuses on enabling computers to understand, interpret, and generate human language. It has a wide range of applications, including language translation, chatbots, and text analysis.
- One of the main challenges in NLP is that human language is highly complex and varied, with a large number of rules, nuances, and exceptions. To handle this complexity, NLP algorithms often rely on machine learning techniques, which enable them to learn from examples and improve their performance over time.
- GPT (Generative Pre-trained Transformer) is a type of language model developed by OpenAI that is trained to generate human-like text. It uses a transformer neural network architecture, which is a type of deep learning model that has been successful in a variety of NLP tasks.
- To train the GPT model, OpenAI fed it a large dataset of text and used an optimization process called "pre-training" to adjust the model's internal parameters. The goal of pre-training is to give the model a strong foundation of knowledge about language and how it is used, so that it can generate coherent and natural-sounding text when it is fine-tuned for a specific task.

I hope this helps! Let me know if you have any questions or if you'd like more information on any of these topics.

Screenshot from [chat.openai.com](https://chat.openai.com)

### 3. Teaching programming and other subjects with repetitive tasks

Zero-shot learning is a machine learning technique which allows a model to classify objects, or predict outcomes for which it hasn't been trained already.

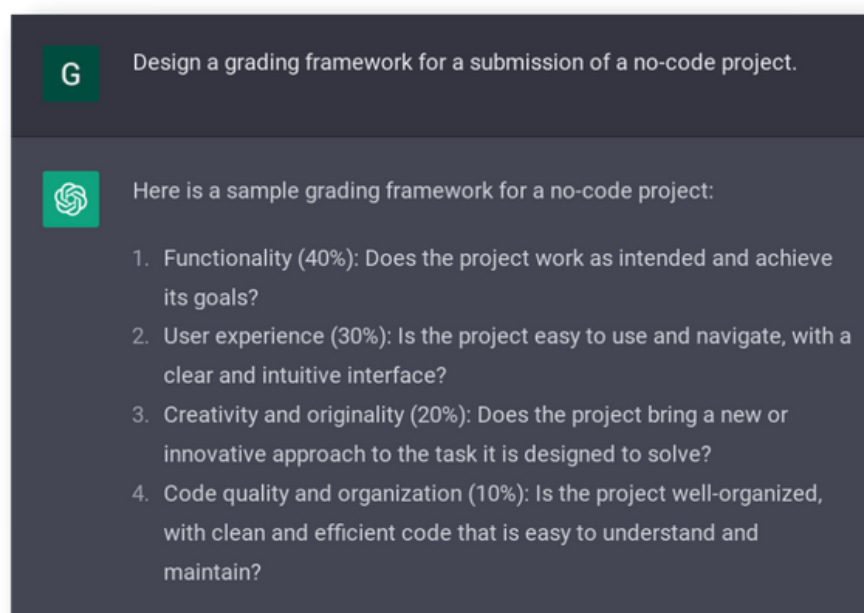
While teaching programming, this can be used to automatically generate code examples or exercises for students, based on their previous knowledge and learning goals. For example, a zero-shot learning model could be trained to analyse a previous exercises completed by a student, in order to generate a new set of exercises customized to the student's skill level.

### 4. Generating assignments and grading frameworks

Another potential use for zero-shot learning is to use it to generate assignments and give feedback to students based on a framework.

The model could analyze the student submission and compare it to a framework associated with a set of correct, or incorrect solutions, and accordingly provide feedback to the student.

While this could potentially liberate educators from the onerous tasks of creating and correcting assignments, it would not completely replace the teacher, since human review will still be needed to ensure accuracy of the assignment and its evaluation.



Screenshot from [chat.openai.com](https://chat.openai.com)

It is important to note that zero-shot learning is still in its early stages of research and development, and still needs a lot of training to mature fully.

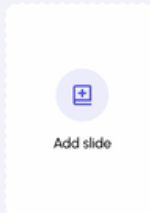
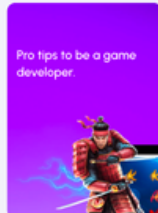
## 5. Generating personalized lesson plans

By using natural language processing and machine learning algorithms, GPT can understand and respond to the unique needs and abilities of each student, providing tailored learning experiences that are more effective and engaging. A teacher could input a list of learning goals and GPT could generate a customized lesson plan with accompanying materials such as readings and activities.

Automating the creation of personalized lesson plans will reduce the burden of teacher workloads, and allow them to focus on student mentoring. When you take this to scale, you can see how it could potentially open the doors to a new era of democratized access to 1:1 mentoring, which was denied to so many students before.

## Find Content

Lesson 1 : Introduction to SOC2 for Companies



Quickly find AI generated content

how to develop a SOC2 Compliance plan

AI Content ▾

**how to develop a SOC 2 compliance**

Develop a specific set of policies and procedures that need to be followed.

Utilize available frameworks and resources to develop the program.

Hire an outside consultant to help with the process.

Research and review best practices to develop the program.

**how to develop a SOC 2 compliance**

process

- 1 Gather and document all policies & procedures
- 2 Develop and implement information security & risk management policies
- 3 Develop data security plans and process for data access control
- 4 Document training & awareness program for employees
- 5 Identify internal & external audit requirements
- 6 Monitor environmental security controls
- 7 Periodically test and validate risk assessment outcomes
- 8 Maintain and regularly review SOC 2 standards
- 9 Implement corrective & preventative measures for any areas of non-compliance 😊

Create documentation to support SOC 2 certification

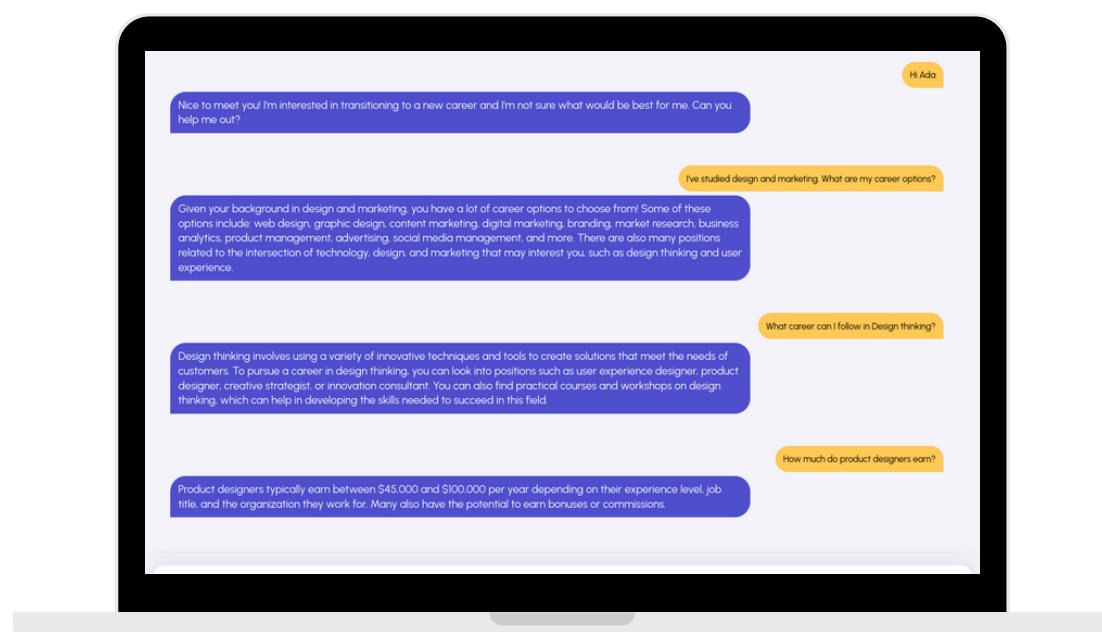
Try Again

Protyppte of personalised lesson creation on [adaptiv.me](https://adaptiv.me)



## 6. Providing additional support and mentoring outside classroom

Language models can be trained to provide students with additional support and guidance outside of traditional class time, and can be an effective way to reinforce learning and encourage engagement. Generative-AI powered mentors can answer students' questions about learning material, guide them to additional resources and provide career mentoring by providing information about career paths, important skill requirements and emerging trends in the job market.



Career mentoring from Ada, the AI-powered mentor on [adaptiv.me](https://adaptiv.me)

# Future of Generative AI & Education

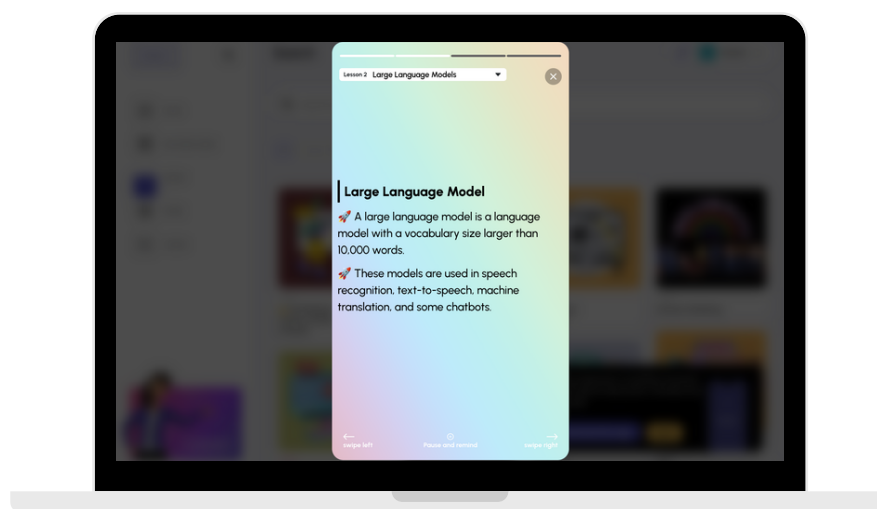
At the dawn of the Internet, education experts had fears about unhindered and uncensored access to information, rampant plagiarism, and the threats to the status of the teacher as the gate-holder of knowledge. Decades later, the world finds itself in a very similar situation with Artificial Intelligence and large language models threatening the role of educators.

With each passing month, large language models will improve in their efficiency with access to more training data, more computing power, and better models. Sequoia predicts that by 2023, generative AI will be able to put together scientific papers and visual design mock-ups; and by 2030, it will write, design, and code better than human professionals in the field. Instead of adopting the ostrich policy, educators should seize the opportunity to upskill and learn to leverage the powers of large language models to improve the future of education.

# Adaptiv and the future of education

Adaptiv is an AI-powered platform which helps educators and industry experts create pedagogical material suited to the content consumption patterns of GenZ. We believe that this will help us solve the skills gap that is leading to wide-scale unemployment, career disillusionment and billions of losses. This will not only help existing teachers, but also allow others to share their knowledge and participate in the upskilling of the future workforce.

By enabling automated lesson creation, Adaptiv will enable transfer of information from subject-matter experts, and allow people from the industry to guide students and young professionals about the emerging requirements of the new economy.



Example of pedagogical material created on [adaptiv.me](https://adaptiv.me)

# Conclusion

Large language models are not a panacea for the challenges facing education. While they have the potential to improve the quality of education and increase access to learning resources, they are only as good as the data they are trained on. If the data used to train the models is biased or lacks diversity, the generated materials may perpetuate these biases and reinforce existing inequities.

Overall, the potential benefits to incorporating language models in education outweigh its limitations and dangers, and the possibilities are constantly evolving as these technologies continue to advance. By carefully considering how these solutions will be used, providing the necessary support and training, and designing personalized and interactive learning experiences, educators can effectively leverage the unique capabilities of language models to enhance the learning experience for their students.

# Disclaimer

*The information shared in this whitepaper is not all-encompassing or comprehensive and does not in any way intend to promote any services of products. The primary purpose of this whitepaper is to explore the potential of this new technology and propose use-cases that will allow stakeholders to make an informed decision.*

*Prior to any decision regarding the use of large language models in education, we strongly advocate a careful study of this whitepaper and other documents on the subject.*

*Certain statements and information featured in this whitepaper are forward-looking statements that are based on and take into consideration certain known and unknown contingencies and risks which in eventuality may cause the estimated results or may differ factually and substantially from the featured estimates or results extrapolated or expressed in such forward-looking statements herewith.*

*For any information about the examples cited, or Adaptiv, please contact: [hello@adaptiv.me](mailto:hello@adaptiv.me)*

