

AI in Education

Mr. André Bugeja



**DDL
TS**



GOVERNMENT OF MALTA
MINISTRY FOR EDUCATION, SPORT, YOUTH
RESEARCH AND INNOVATION

digitalliteracy.skola.edu.mt

Agenda

- Defining AI, Examples and History
- Potential of AI in Education
- Emerging AI Technologies
- Chatbots, Prompt Engineering, Limitations
- Prompt Examples
- Teaching with AI



What is AI?

- AI stands for Artificial Intelligence.
- AI is the simulation of human intelligence processes by machines, especially computer systems.
- AI programs can be trained on large amounts of data to recognise patterns and make predictions.



What is AI?

- AI can be used to automate tasks that typically require human intelligence.
- AI has the potential to transform a wide range of industries and improve our lives in many ways.



Data Sets

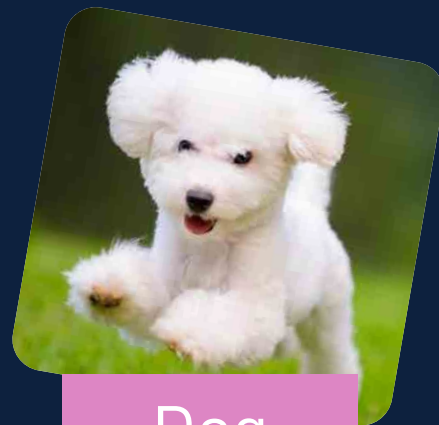
Data sets is a collection of data meticulously curated to enable AI systems to learn, make predictions, and gain valuable insights.

Example: An AI system can learn to distinguish between cats and dogs by analysing many photos (data set) of cats and dogs.

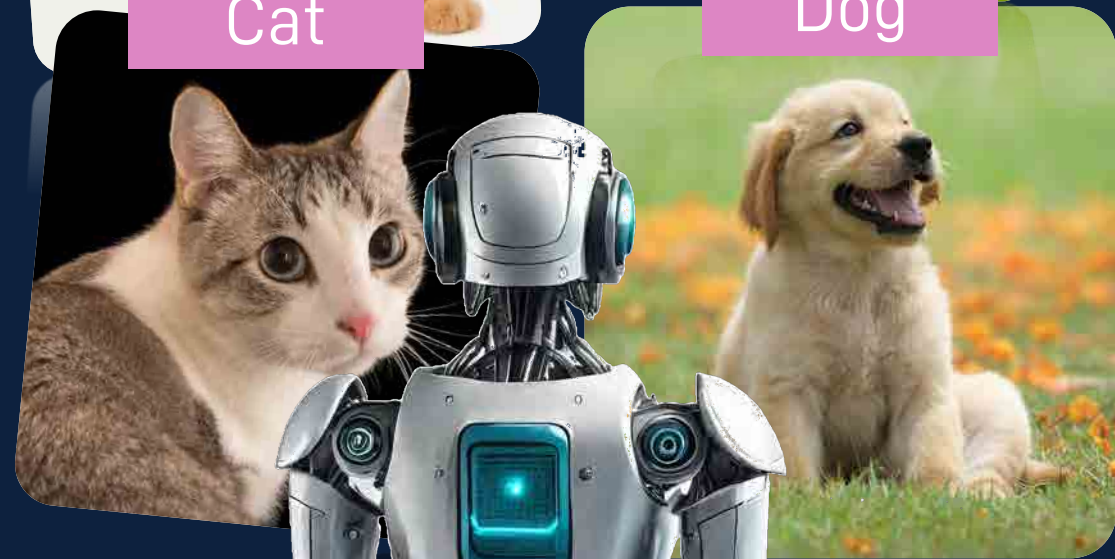
The AI can then accurately classify new, unseen photos as either cat or dog.



Cat



Dog



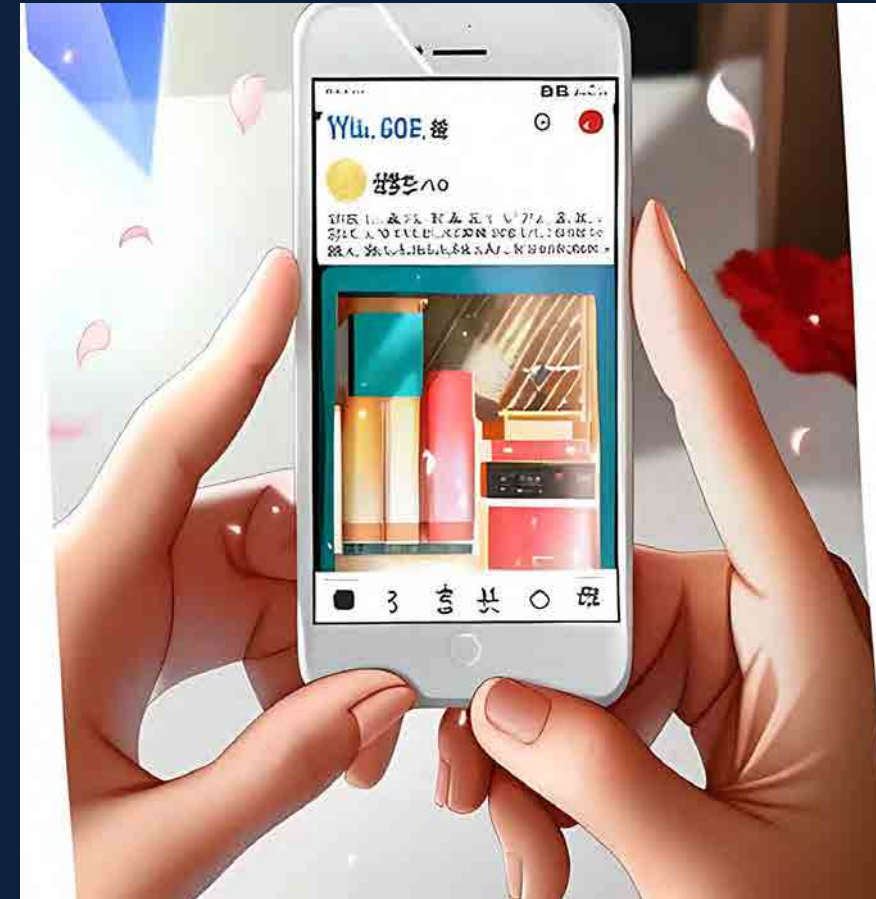
Examples of AI

- **Personal Assistants:** Voice assistants like Google Assistant, Siri and Alexa.
- **Smart Home Devices:** AI-powered devices like smart security cameras and lighting system.
- **Healthcare:** AI can be used in healthcare to diagnose and treat diseases.
- **Self-driving Cars:** Semi or fully autonomous vehicles such as those by Google and Tesla.



Examples of AI

- **Content Recommendation:** Online platforms like Facebook, Google, Spotify, Netflix and YouTube use AI to recommend content.
- **Natural Language Processing:** AI-powered chatbots like Chat GPT can understand and respond to natural language queries.
- **Image and Video Recognition:** AI can be used to recognize and analyse images and videos.



History of AI

The concept of artificial intelligence began to take shape as a formal academic discipline in the mid-20th century:

- 1956: The Dartmouth Conference, marks the birth of AI.
- 1960s-1970s: AI researchers develop rule-based expert systems.
- 1990s: Renewed interest in AI research after an AI winter in the 80s, particularly in the areas of machine learning and natural language processing.
- 2000s-present: Advances in deep learning, big data, and cloud computing have led to breakthroughs in areas such as image and speech recognition, autonomous vehicles, and game-playing AI.



1997: IBM's Deep Blue became the first computer to beat a chess champion when it defeated Russian grandmaster Garry Kasparov.

Potential of AI in Education

- **AI Tutors:** AI can help create personalized learning experiences for students by adapting to their learning style, pace, and needs. This can improve student engagement, motivation, and achievement.
- **Curriculum Development:** AI can analyse data on student performance and feedback to help educators develop more effective curriculum and teaching strategies.
- **Assessment and Grading:** AI can be used to grade assignments and assessments, saving time for teachers and providing more accurate and objective evaluations.
- **Accessibility:** AI can provide support for students with disabilities by offering real-time captioning, sign language translation, and other assistive technologies.

Emerging AI Technologies

- **Text to Image: Generative fill** – Add and/or remove parts of existing images.
 - Adobe Firefly - firefly.adobe.com
 - DALL.E 3 in Microsoft Copilot
- **Text to Video** – Generate a video from a prompt
 - klimgai.com
 - runwayml.com
 - invideo.io – Generates videos using stock images.
 - Firefly Video Generator (Coming Soon)
 - openai.com/sora



Emerging AI Technologies



Chatbots - Newest LLM can now reason across audio, vision and text in real time. Can solve increasingly complex problems.

- <https://aistudio.google.com/live>

Text to Music – Generate music from a prompt

- suno.ai
- ud.io

• **Speech Synthesis** – Generate speech from text or speech from speech.

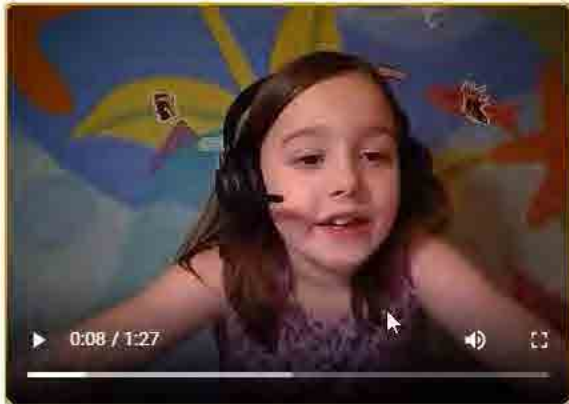

- elevenlabs.io
- ttsmaker.com
- SeamlessM4T by Meta - ai.meta.com/blog/seamless-m4t/

AI Features in Education Software

- **PowerPoint** – Home tab - Design Ideas
- **PowerPoint Online** – Slide Show tab - Rehearse with Coach
- **Teams Assignment** – AI Suggestions for Instructions, Learning Accelerators: Reading Progress, Speaker Progress & Maths Progress.
- **Word Online** – Review – Word Count – Editor Score
- **Word** – Review – Language - Translate
- **Immersive Reader** - Office Tools Such as Word Online View – Immersive Reader
- **OneNote – Insert** – Maths Assistant

Geography

Close

Auto-Detect PREVIEW Pronunciation sensitivity
 Medium

Attempts: 7 Level: J Words: 126 Insights

82

Correct words per minute

92%

Accuracy rate

2

Mispronunciations

4

Repetitions

5

Omissions

1

Self-corrections

3



Insertions

The study of Earth's landforms is called **physical** geography. Landforms can be mountains and valleys. They can also be glaciers or rivers. Landforms are sometimes called physical **physical** features.

It is important for students to know about the physical geography of Earth. The seasons, **the** **that** atmosphere **atmosphere** and all the natural processes of Earth affect where people are able to live. Geography is one of a combination **combination** of factors that people use to decide where they want to live.

The **history** **is** physical features **features** of a **region** are often rich in resources. Within a nation, mountain ranges become natural borders **for** **settlement** **areas**.

Fresh water sources **sources** also influence where people settle. People need water to drink. They also need it for washing. Throughout history, people have settled near fresh water.

 Darrow, Alex 

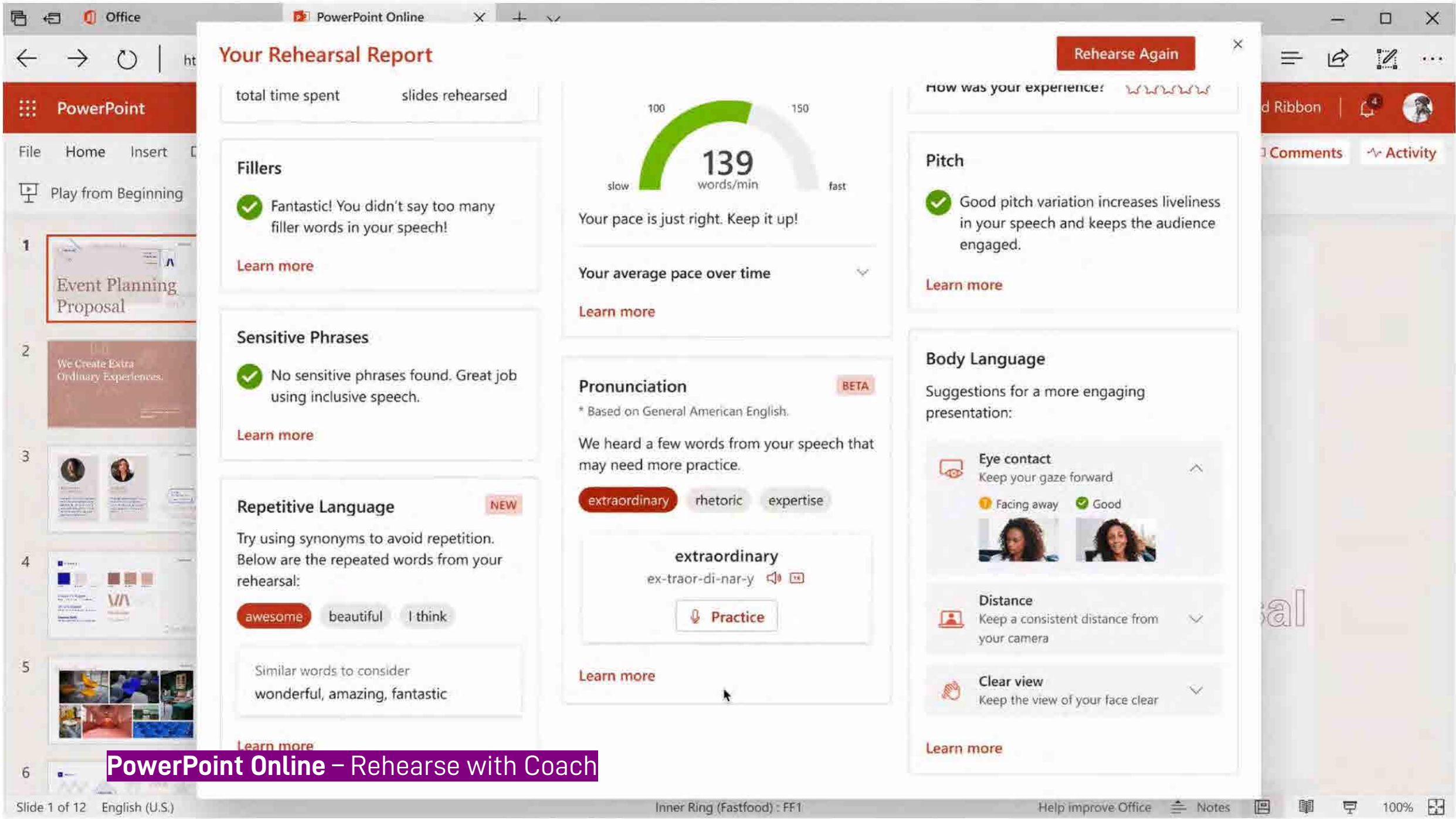
Student Work
Turned in February 10, 2023 at 9:38 PM
Late 
[View History](#)

 **Geography** 

Feedback

Great job!

Points
No points[Return](#) **Teams Assignment – Reading Progress**



Your Rehearsal Report

total time spent slides rehearsed

Fillers

✓ Fantastic! You didn't say too many filler words in your speech!

[Learn more](#)

Sensitive Phrases

✓ No sensitive phrases found. Great job using inclusive speech.

[Learn more](#)

Repetitive Language NEW

Try using synonyms to avoid repetition. Below are the repeated words from your rehearsal:

awesome beautiful I think

Similar words to consider
wonderful, amazing, fantastic

[Learn more](#)



Your pace is just right. Keep it up!

Your average pace over time

[Learn more](#)

Pronunciation BETA

* Based on General American English.

We heard a few words from your speech that may need more practice.

extraordinary rhetoric expertise

extraordinary
ex-traor-di-nar-y

[Practice](#)

[Learn more](#)

[Rehearse Again](#)

How was your experience:

Pitch

✓ Good pitch variation increases liveliness in your speech and keeps the audience engaged.

[Learn more](#)

Body Language

Suggestions for a more engaging presentation:

Eye contact
Keep your gaze forward

Facing away Good

Distance
Keep a consistent distance from your camera

Clear view
Keep the view of your face clear

[Learn more](#)

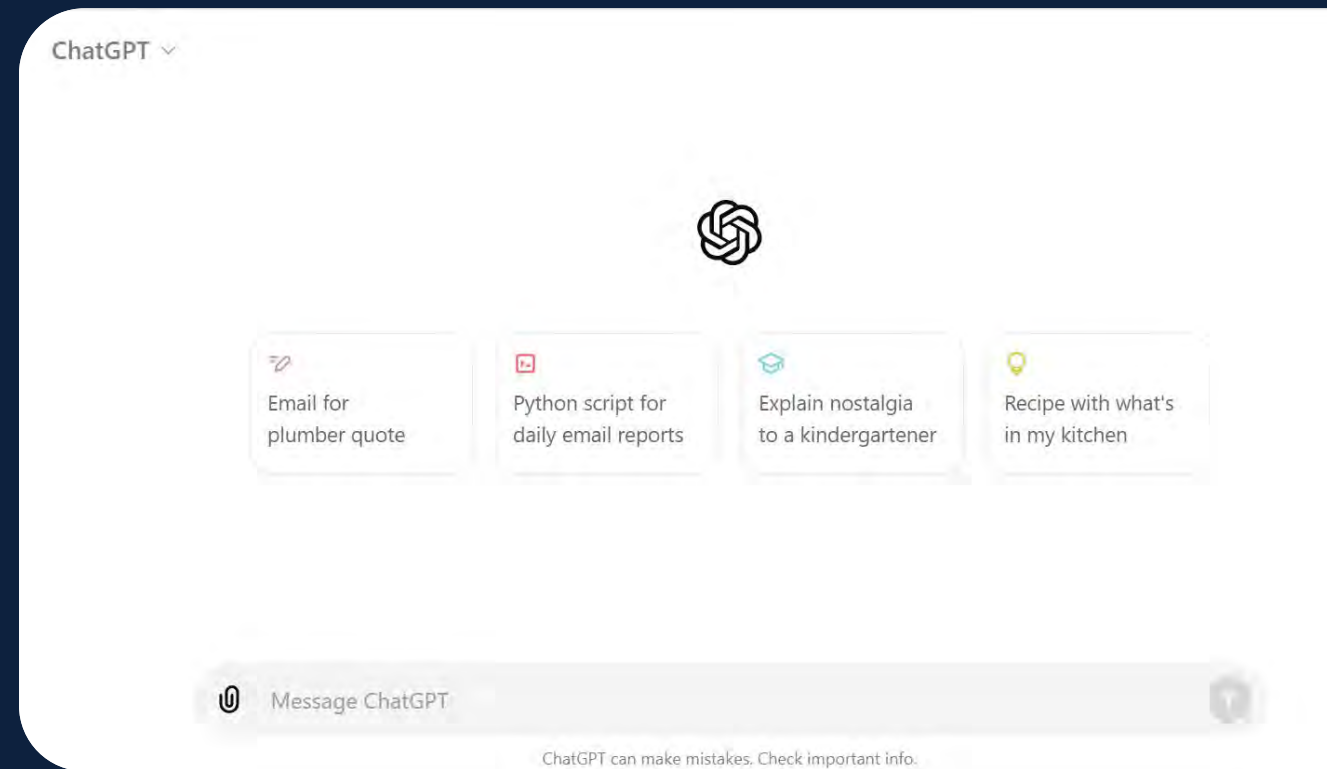
PowerPoint Online - Rehearse with Coach

Hands On Activity

- Use Microsoft Copilot to create your own AI image using the theme of “Teachers and Summer Holidays”.

AI Generated Text

- ChatGPT, Copilot and Gemini are examples of AI-powered Large Language Models (LLM).
- AI-powered language models are capable of writing essays, solving science and math problems and producing working computer code.



AI Chatbots



Chat GPT

chat.openai.com



Microsoft Copilot

copilot.microsoft.com



Gemini

gemini.google.com

GEMINI

These AI Chatbots use large language models (LLMs) trained to communicate and generate human-like text.

Uses of AI Powered Language Models in Education

Teacher Assistant

- Helps the teacher generate lesson plans and ideas.
- Generates lesson content, examples, questions, success criteria.
- Suggests activities and educational tools to enhance learning.



Uses of AI Powered Language Models in Education

Personal Teacher

- Research Assistant – Research information about a particular topic. Students can also ask questions about a particular problem and get step by step explanations about how to solve it.
- Generate self-study questions about any topic.
- Can help students understand complex topics by giving alternative explanations.
- Writing Assistant – Can generate ideas for students to help them write essays.
- Language Learning Assistant – Provides translations and explanations of meaning of words or phrases.



Prompt Engineering

- Prompt engineering is the art of asking the right question to get the best output from an AI system.
- Selecting the right words, phrases and formats to guide the AI system to produce the desired result.
- Prompt engineering requires understanding the capabilities and limitations of the AI system, as well as the goals and expectations of the user.

Prompt Engineering Checklist



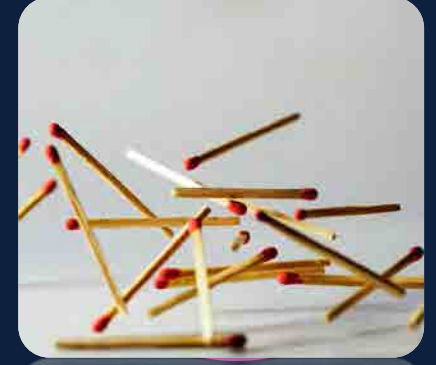
Set the Scene



Be Specific



Simplify Your
Language



Structure the
Output



1. Set the Scene

Provide the AI chatbot with context on the role, expertise and environment it should use to guide the output.

- *I am an English language teacher teaching Middle School Students.*
- *I am a Physics teacher teaching Secondary school students .*



2. Be Specific

Clearly define the task and provide details about what you want to include.

- *Create a 40-minute lesson plan about the following learning outcomes...*
- *Create a multiple-choice quiz about the Coastal Towers of Malta. Generate 10 questions with 4 choices for each question.*



3. Simplify Your Language

Use a conversational approach with simplified language that avoids jargon. Breaking down complex tasks into a sequence of simpler prompts

- *Generate a list of engaging class activities about Input and Output Devices in the Computing Subject.*



4. Structure and Output

Tell the chatbot how to structure the output with specifics on format, audience and or sections.

- *Present the data in a table.*
- *Display the main points in a bulleted list.*
- *Adapt the questions for 12-year-old students.*
- *Mark the correct answer.*



5. Provide Feedback

Converse with the chatbot to fine tune the output with specifics of what needs to be revised to meet your needs.

- *Make the email more formal.*
- *Simplify the explanation.*
- *Provide me with 5 multiple choice questions to assess the student's knowledge about the topic.*



Chatbot Limitations

Refining the output may be needed:

- AI systems are not perfect and may produce outputs that are incomplete or inaccurate.
- Educators and students need to be able to refine the prompts and evaluate the outputs of AI systems, and to adapt them to their specific educational contexts and goals.



Chatbot Limitations

Data quality and availability:

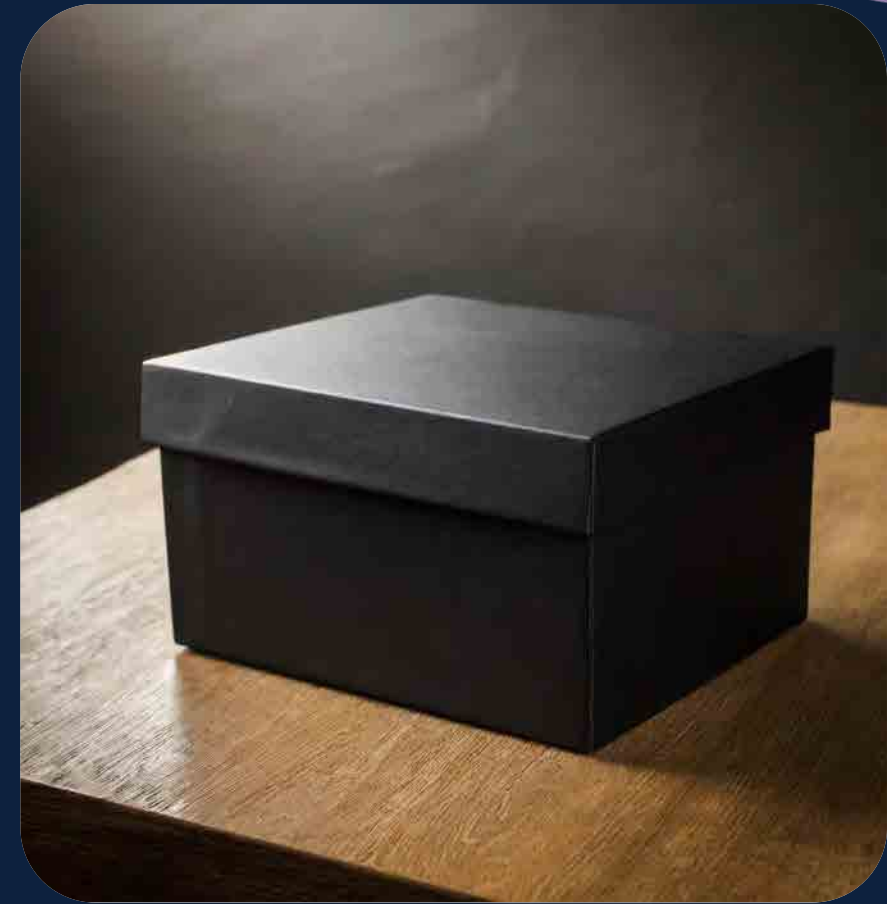
- AI systems rely on large amounts of data to learn and perform tasks, but not all data is reliable, relevant, or accessible.
- Chatbots sometimes hallucinate by writing plausible-sounding but incorrect or nonsensical answers.
- Educators need to ensure that the output produced by the AI chatbot is accurate.



Chatbot Limitations

Explainability and transparency:

- AI systems operate as black boxes. It is consequently difficult, if not impossible, to know why and how particular content has been created.
- Potential biases and errors may arise from using AI systems that are not transparent or accountable. Users may not be able to justify or verify the AI outputs.



Chatbot Limitations

Lack creativity and empathy:

- AI systems lack the human abilities of creativity and empathy that are essential for many educational activities.
- Educators need to recognize the limits of AI in generating original, diverse, and meaningful content, and in understanding and responding to the emotions and needs of learners.



Chatbot Limitations

Preventing Learning:

A worry is that young learners, because they are by definition less expert than teachers, might unknowingly and without critical engagement accept AI output that is superficial, inaccurate or even harmful.

Teachers should ensure that students are aware of the benefits and limitations of AI, and that they can critically evaluate the information and feedback they receive from AI.



Potential for Cheating

Students are using AI Powered Language Models to write assignments, passing off AI generated essays as their own.



Possible solutions:

Give AI Resistant Assignments.

Class Presentations (Powerpoint, Flip etc)

Flipped Classroom

Cheating is not a new problem: schools have survived calculators, Google, Wikipedia, essays-for-pay websites, and more!



Prompt Examples for Educators

Generate text for a comprehension test.

AN

- Write a 150-word story about a boy who lived in Rome in 1950's. He loved ice cream. The story should be appealing to young teenagers aged 13. The story should be written in Italian.



Generate quiz questions.



Write 6 questions about the passage. Questions should be in Italian.

|

Present questions
in a table format.



Write 6 true or false questions. Present them in a table allowing a column to mark true or false.



Generate lesson plans.

AN

Create a 40 minute lesson plan for the Computing subject aimed at year 9 students. The lesson topic is an introduction to Arduino using the onboard LED.


Introduction (5 minutes)

- Introduce the topic of Arduino by explaining that it is a microcontroller board used for building electronics projects.
- Explain that Arduino boards can be used to control a wide range of hardware components, such as LEDs, motors, and sensors.
- Show an Arduino UNO board and explain its key components.

Demo (10 minutes)

- Show how to connect the Arduino board to a computer using a USB cable.
- Demonstrate how to download and install the Arduino IDE software on the computer.
- Show how to open the Arduino IDE software and set up a new project.
- Explain the basic structure of an Arduino sketch, including the setup and loop functions.

Activity 1 - Blinking LED (15 minutes)

- Provide each student with an Ar  Regenerate response able, and a computer with the




Activity 1 - Blinking LED (15 minutes)

- Provide each student with an Arduino UNO board, USB cable, and a computer with the Arduino IDE software installed.
- Instruct the students to connect the Arduino board to the computer and open the Arduino IDE software.
- Guide the students through the process of writing code to blink the onboard LED.
- Demonstrate how to upload the code to the Arduino board and test it.

Activity 2 - Modifying LED Blink (10 minutes)

- Instruct the students to modify the code to change the speed of the LED blink or to blink multiple LEDs at the same time.
- Encourage the students to experiment and make their own modifications to the code.
- Have the students share their modified code and demonstrate their results.

Conclusion (5 minutes)

 Regenerate response




Activity 2 - Modifying LED Blink (10 minutes)

- Instruct the students to modify the code to change the speed of the LED blink or to blink multiple LEDs at the same time.
- Encourage the students to experiment and make their own modifications to the code.
- Have the students share their modified code and demonstrate their results.

Conclusion (5 minutes)

- Recap the key concepts covered in the lesson, including the purpose of Arduino, how to write and upload code, and how to control the onboard LED.
- Encourage the students to continue experimenting with the Arduino board and to think about potential projects they could build using it.

 Regenerate response



Generate
homework ideas.

AN

What follow up homework can I assign to my students to they can practice what we covered during the lesson at home? Focus on the in built LED.



Generate quiz questions.

AN

Generate 10 multiple choice questions related to the lesson plan we discussed. Please mark the correct answer.

Generate lesson ideas.

AN

I am preparing a Computing lesson for Year 9 Students. The topic is about Input and Output devices. I would like to make the lesson more interesting what activities do you suggest?



Generate rubric for
assessment.

AN

Can you create a rubric in the form of a table for the Design Challenge task. Each student will be asked to present one device that they designed and mention its features.





Prompt Examples for Students

Ask any
question.

AN

I am studying physics at year 9 and I need to find the volume of an irregular rock using the displacement method. How can I go about it?

|



Simplify an explanation.



Can you explain in simpler terms?



Generate
example exam
questions on
any topic.

AN

Provide me with an example exam question related to finding the volume of an irregular shaped rock using the displacement method. Do not give me an answer.



Break down
problems in
steps.



Provide me with the method and answer for solving this problem.

|

A horizontal input field with a vertical cursor on the left. To the right of the cursor are several faint navigation icons (back, forward, search, etc.). On the far right of the field is a small grey triangle icon pointing to the right, likely a 'send' or 'submit' button.

Generate ideas
for essay
writing.



I am a student at year 10 and I need to write an English language essay of 400 words. The title of the essay is "The most influential person in my life". Can you give me some ideas in point form to help me write my essay?

Translate
text.

AI

I have the following text in Spanish can you translate it to English for me?

Familia pequeña

Mi familia no es muy grande, somos solo cuatro personas: mi padre, mi madre, mi hermana y yo. También tenemos un perro.

Yo soy mayor que mi hermana, pero ella es más alta. Yo tengo doce años y ella once. Mis padres se llaman Javier y María, mi hermana se llama Sara y yo Luis. Vivimos todos juntos en una casa muy bonita.

Mi padre es banquero y mi madre ama de casa. Por la mañana, desayunamos juntos en la cocina. Me gusta desayunar con mi familia. Además, por las mañanas siempre tengo hambre. Después del colegio, mi madre prepara una comida deliciosa. Por la tarde, mi madre queda con sus amigas, y mi padre juega al tenis. Mi hermana y yo hacemos los deberes, y después vemos la televisión. Los viernes por la tarde vamos los cuatro de compras.

Mi padre es alto y rubio, y mi madre es morena y delgada. A mi hermana le gusta quedar con sus amigas en el parque. Yo me c

Stop generating

|



Small Family




My family is not very big, we are only four people: my father, my mother, my sister, and me. We also have a dog.

I am older than my sister, but she is taller. I am twelve years old and she is eleven. My parents' names are Javier and Maria, my sister's name is Sara, and my name is Luis. We all live together in a very nice house.

My father is a banker and my mother is a homemaker. In the morning, we have breakfast together in the kitchen. I like having breakfast with my family. Also, in the mornings, I am always hungry. After school, my mother prepares a delicious meal. In the afternoon, my mother meets her friends, and my father plays tennis. My sister and I do our homework, and then we watch TV. On Fridays in the afternoon, the four of us go shopping.

My father is tall and blond, and my mother is brunette and slim. My sister likes to meet her friends in the park. I have much more fun playing video games at home.

 Regenerate response



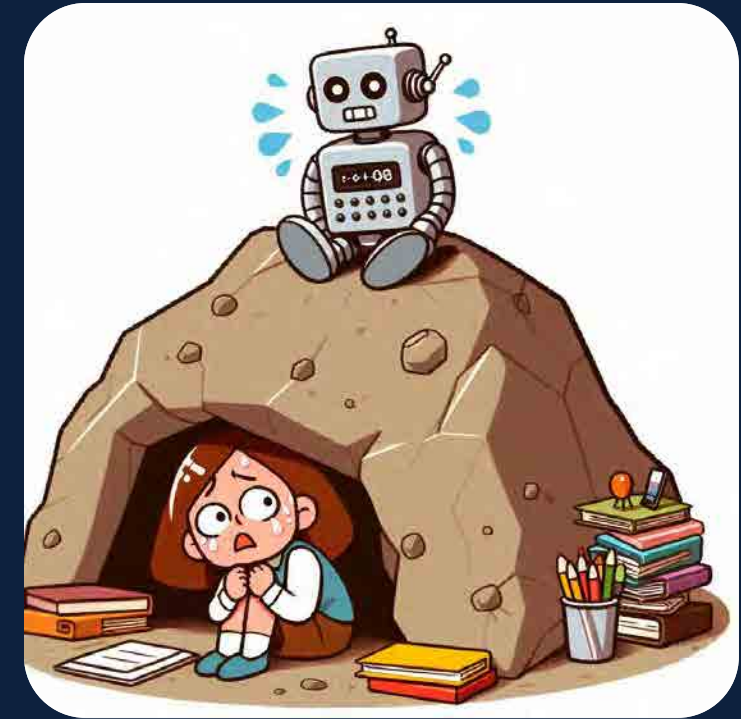
Hands On Activity

- Use Microsoft Copilot to create the following resources related to your subject:
 1. Create a lesson Plan.
 2. Create lesson notes related to the topic.
 3. Create a work sheet with multiple choice questions.
 4. Create an idea for a class project.

Why Teach with AI?

Teachers should consider teaching with AI whenever it complements their teaching goals and methods. Teaching with AI also provides students with:

- **Practical Experience:** Using AI in the classroom gives students first-hand experience with this technology.
- **Demystify AI:** By interacting with AI, students can move beyond abstract concepts and see AI as a tangible and accessible tool making it less intimidating.



Why Teach with AI?

- **Inspiring Curiosity:** Using AI in teaching can spark students' curiosity about how AI works, leading them to learn more about AI principles.
- **Skill Development:** As AI becomes increasingly prevalent in various fields, having a basic understanding of AI can be a valuable skill for students. It can prepare them for future careers and help them navigate a world where AI will play a significant role.



Teaching with AI: Example

Language Learning / Literature / History / Social Studies

Write a prompt to make the AI chatbot impersonate a character that students can practice conversation with. The AI could take the role of a native speaker to practice a language, it could impersonate a fictional character or a historical figure.

Students can chat with the AI to improve their language skills, get different insights about literature or gain different perspectives on historical events and personalities.

Teaching with AI: Example

History

Students can be given an assignment to generate different versions of a historical event from different points of view.

Example: Describe the French Revolution from the point of view of different social classes such as nobles and peasants.

Students can point out the differences from these versions to learn about bias in the way history is written.

Teaching with AI: Example

Science

The AI chatbot can be made to represent a scientific concept or phenomenon.

Students ask questions, conduct "experiments" (guided prompts), and receive feedback to deepen understanding.

Teaching with AI: Example

Science

The AI chatbot can be made to represent a scientific concept or phenomenon.

Students ask questions, conduct "experiments" (guided prompts), and receive feedback to deepen understanding.

Teaching with AI: Example

Languages / Creative Writing

Compose a short story or poem in collaboration with the chatbot.

Students use the chatbot to generate ideas, such as come up with a list of topics or how to better structure their writing.

Teaching with AI: Example

Literature

Students generate a sonnet using the AI Chatbot. Students then generate alternative versions of the sonnet to mimic the style of the authors they are studying.

This will help students better understand the concept of style in literary works.

Teaching with AI: Example

Critical Thinking & Communication Task

Students use the AI Chatbot to generate information about any topic. Students then have to verify the information, summarise it and present it to the class.



The implications of GenAI for assessment go far beyond the immediate concerns about learners cheating on written assignments...

...We therefore need to rethink what exactly should be learned and to what ends, and how learning is to be assessed and validated

Guidance for generative AI in education and research (UNESCO) 2023



Thank You