

VIA AFRIKA DIGITAL EDUCATION ACADEMY

Getting to the Fourth Industrial Revolution (4IR)

SESSION 11

Taking Generative AI and ChatGPT into education

CLASS NOTES



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Course 10 content

Teaching for the Fourth Industrial Revolution (4IR)

- Session 1: Getting to the Fourth Industrial Revolution
- Session 2: Augmented Reality (AR)
- Session 3: Virtual Reality (VR)
- Session 4: Big Data
- Session 5: Artificial Intelligence (AI)
- Session 6: Coding
- Session 7: Robotics
- Session 8: Genready for the 4IR
- Session 9: Other 4IR Technologies and Applications
- Session 10: An Introduction to Generative AI and ChatGPT
- Session 11: Taking Generative AI and ChatGPT into education

Getting to the Fourth Industrial Revolution (4IR)

Session 11: Taking Generative AI and ChatGPT into education

Class Notes



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Abbreviations and terms

Bloom's Revised Taxonomy: A pedagogical framework for eLearning. [See pedagogy, See eLearning]

eLearning: Learning that is supported by, enhanced by, or facilitated through Information Communication Technologies (ICTs), and that is supported by reconsiderations of content, and a relevant pedagogy. [see ICT]

ICT: Information and communication technologies.

PD Points: Professional Development Points [See SACE]

Pedagogy: The how and why of what we do in the classroom. The method and practice of teaching, especially as an academic subject or theoretical concept.

PedTech: Pedagogical Technology for what happens when we want to use technology in the classroom

RAT: Replace, Amplify, Transform. A pedagogical framework for eLearning. [See pedagogy, See eLearning]

SACE: South African Council for Educators. Awards Continuous Professional Development Points (CPDP) to teachers.

SAMR: Substitution, Augmentation, Modification, Redefinition. A pedagogical framework for eLearning. [See pedagogy, See eLearning]

TPACK: Technological, Pedagogical and Content Knowledge. A pedagogical framework for eLearning. [See pedagogy, See eLearning]

Contents

Outcomes and content	vi
Overview	viii
Using AI in education	1
Is using AI cheating?	1
Creating an AI use policy	3
Bloom's Taxonomy Revised (Reviewed for AI)	4
AI Rules!	8
Using AI to personalise learners' education	8
Using AI to create effective explanations, examples and analogies	14
Using AI for planning	19
Developing content with AI	21
Using AI to create assessment tools	22
About the Final Assessment	26
Final Assessment	27
Acknowledgements	30

Outcomes and content

Outcomes of the session

By the end of the session, the participant will be able to:

- appreciate the use of AI in education as not necessarily cheating
- develop an acceptable and unacceptable use of AI policy
- appreciate how to use Bloom's Taxonomy Revised (Reviewed for AI)
- use AI to personalise learners' education: interactive tutor, reading aid
- use AI to create effective explanations, examples, analogies
- appreciate the use of MagicSchool.ai as an application of generative AI
- use AI for planning: lesson planning
- use AI for content development: conceptual understanding generator, common misconception generator
- use AI to create assessment tools: multiple choice quizzes, rubrics
- use AI to create a simple animation

Content of the session

- Effectively using AI in education: acceptable and unacceptable use of AI policy; Bloom's Taxonomy Revised (Reviewed for AI); interactive tutor; reading aid; creating effective explanations, examples, analogies; for lesson planning; conceptual understanding generator, common misconception generator; multiple choice quizzes, rubrics
- MagicSchool.ai as an application of generative AI
- Animated Drawings as an AI application

For your information, here is detail about the introductory session.

Outcomes of the session *An introduction to Generative AI and ChatGPT*

By the end of the session, the participant will be able to:

- explain what AI, Generative AI and ChatGPT are
- discuss the similarities and differences between Generative AI applications: Google Bard, Microsoft Copilot
- talk about the pros and cons of using generative AI
- access ChatGPT on the web and apps
- create a basic prompt and understand how output is created
- understand the importance of verifying information from generative AI
- understand what prompt engineering is and why it is important to do skilfully
- create various prompts

Content of the session *An introduction to Generative AI and ChatGPT*

- AI, Generative AI and ChatGPT
- Generative AI applications: Google Bard, Microsoft Copilot
- The pros and cons of using Generative AI
- ChatGPT: how to access it, how to use it
- Prompt engineering

Overview

Welcome to Taking Generative AI and ChatGPT into education. This session should only be completed after doing An introduction to Generative AI and ChatGPT as the foundational knowledge and skills developed there are required to make the most of this session.

This session is about using Generative AI, and ChatGPT in particular, in ways that make an educator's life easier.

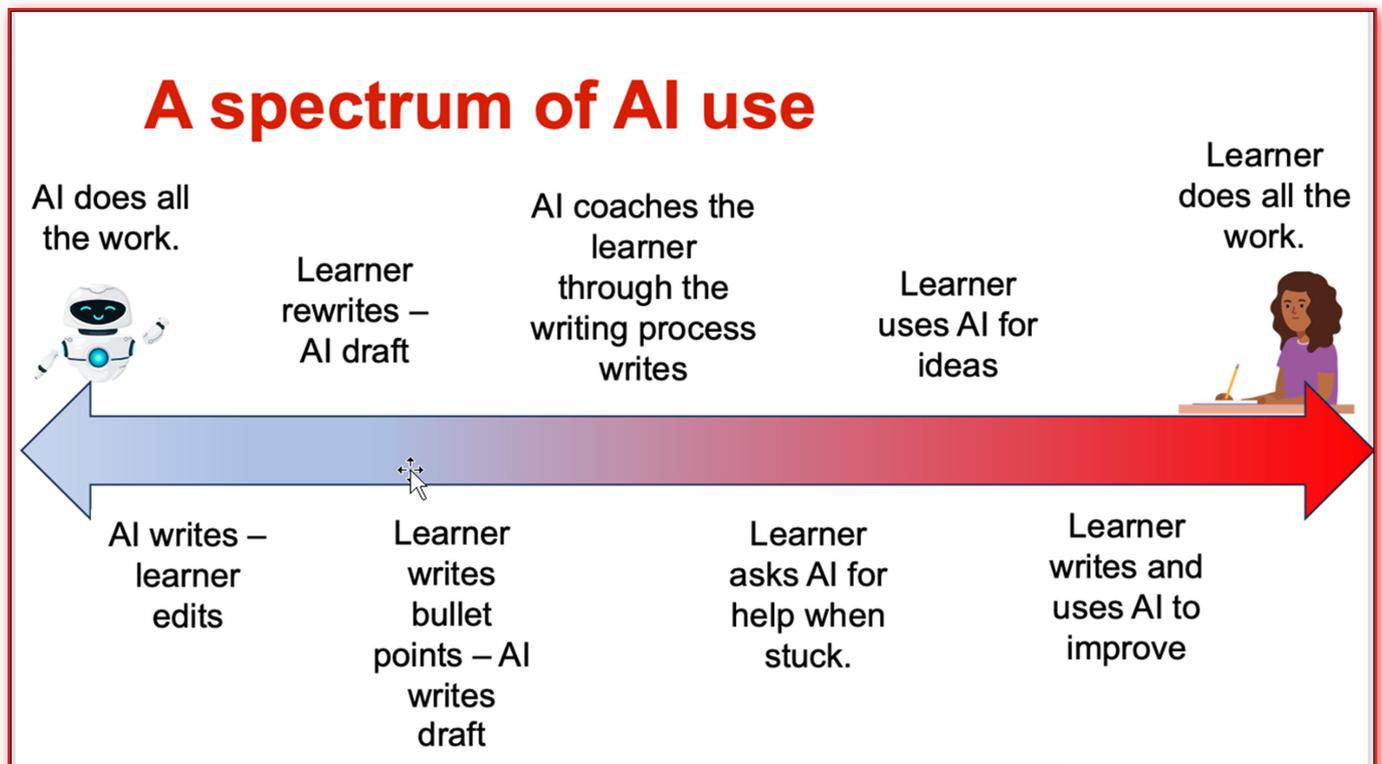
Please be aware that this session was written in October and November of 2023. The field of AI is changing just about all the time. This session will give you enough knowledge to go about finding out about the latest developments by yourself.

Using AI in education

AI is becoming ubiquitous in educational institutions through tools like ChatGPT. This raises important questions around academic integrity, learner skills, and preparing for an AI future.

Is using AI cheating?

According to Matt Miller, an educational blogger, there is a spectrum of AI use, from AI doing all the work to learners doing all work by themselves. Where to draw the line depends on the learning goals and assignment.



On the far left, AI does all the work, and there is no learner thought other than where must I type in my prompt. This is definitely not acceptable. The fact is, this type of working doesn't develop the learner's skills at all. This approach should be discouraged.

On the far right, the learner does all work by themselves and there is no use of the technological world. While this is what we expect of our learners in an exam situation, this is not necessarily the ideal though because it is disconnected from the real world.

Surely the aim of a teacher is to prepare learners for the real world?

So, what lies between these two extremes?

What if the AI writes and the learner makes small edits? This is acceptable, if, and I stress if, the goal is to evaluate AI writing. This is not the case though.

Moving closer to the right, the learner rewrites what the AI has written as a draft. Yes, this does develop the learner voice and ownership but is it enough?

What if the learner provides bullet points, and the AI writes a draft? This prepares learners for real world AI use where the human leads, and the AI assists. But this is still too reliant on AI.

Closer to the right, the AI coaches the learner through the writing process. Later on, we will talk more about using ChatGPT as a tutor for a learner, and this is similar. In an ideal world, all teachers would love to be able to do this sort of one-on-one work, but they cannot. Using AI in this way supports the learner.

Perhaps the learner could ask the AI for help when stuck? The learner is encouraged to work alone, but also learns that there are times that help can and should be sought. The teacher is not overloaded with assisting.

Another option is that the learner consults AI for ideas. This is like using the internet for inspiration so perhaps AI is not being used to its fullest.

The learner writes and uses AI to improve. This does seem a good option, but it is possible that the AI's suggestions and the teacher's goals may not be in alignment causing confusion for the learner.

As you can see, Matt Miller sees AI as a tool that can be used responsibly. But that means that there has to be transparency in its use. Teachers need to say what their expectations are, and learners must be taught to use AI responsibly for their own growth.

Professor Tanja Bosch from the University of Cape Town led research into South African university students' use of AI-powered tools for engaged learning in late 2023.

Among some interesting insights, the researchers note that there is a nuanced approach to the use of Generative AI among the students they surveyed. The students see Generative AI as a useful tool to help them in their work, not a genie from a lamp to do all their work for them.

The researchers call for AI literacy interventions in schools to prepare learners for life with Generative AI. An AI policy is a good place to start.

Read more:

https://www.researchgate.net/publication/374795074_South_African_University_Students'_Use_of_AI-Powered_Tools_for_Engaged_Learning

Creating an AI use policy

Artificial intelligence offers many benefits as a supplemental educational tool. However, we must establish clear expectations and boundaries to ensure it is used appropriately by learners. Let's explore a 5-step process for drawing up school-wide guidelines.

Step 1. Educate yourself on AI capabilities.

This is important for all the teachers in the school, even those who do not wish to use AI, or let learners use AI, although hopefully they will change their minds. Test tools like ChatGPT to understand their strengths and limitations. Become familiar with the technology so you can guide learners effectively.

Step 2. The whole staff must align on core educational goals.

What skills and competencies do you all want learners to develop at school? How can AI support or hinder this? Clarify priorities for human-driven learning.

Step 3. Define acceptable and unacceptable AI use cases.

Outline appropriate supplemental uses that enhance skills and self-directed learning. But also identify unethical uses like plagiarism, substitution, and bypassing learning processes. Here are some examples.

Acceptable	Unacceptable
Using AI to clarify confusing concepts or provide explanations.	Asking AI for direct answers to an assignment without trying to understand the material.
Getting suggestions from AI on resources to expand on a topic.	Asking AI to summarize a book instead of reading it.
Using AI to help brainstorm ideas for an essay.	Asking AI to write a complete essay without doing research/writing.
Asking AI for feedback to improve writing style and technique.	Submitting AI-generated content as one's own without acknowledging it.
Getting guidance from AI on how to structure an argument.	Asking AI to provide a ready-made statement with no original thought.
Using AI to better understand historical context of texts.	Asking AI for responses to discussion questions without reflection.
Using AI to strengthen research skills for projects.	Asking AI for pre-made bibliography/sources without research.

The key distinction is using AI to enhance learning versus substituting human effort and skill development.

Appropriate use entails utilizing AI for supplemental support, while upholding academic integrity. Unacceptable use is leaning on AI to perform critical thinking tasks or bypass learning processes. Setting clear guidelines will help learners use AI productively.

Step 4. Draft initial guidelines and get feedback.

Circulate proposed acceptable use policies among teachers, parents, and depending on their age, learners. Refine the policy based on diverse perspectives and consensus building.

Step 5. Share the guidelines across the school.

Educate all staff on expectations. Equip them to have open discussions with learners. Reinforce that AI is a learning tool requiring responsible use. And then implement them consistently.

This 5-step process will lead to a policy that supports learning while upholding academic integrity.

Task

- Develop your own first draft of an acceptable and unacceptable use of AI for your educational institution policy.
- Share it and get feedback from colleagues, and if possible, learners.

Bloom's Taxonomy Revised (Reviewed for AI)

Bloom's Taxonomy Revised is a model that classifies different types of cognitive processes into six levels: remember, understand, apply, analyse, evaluate and create. Each level requires a higher degree of cognitive involvement and complexity than the previous one. However, with the rapid development of generative AI, some of these levels can be easily achieved by AI tools that can generate text, images, code, music and more. Therefore, we need to review how we can design tasks that require unique human skills that AI cannot replicate or imitate. Oregon State University ECampus has done useful work in exploring Bloom's Taxonomy Revised for use in education as Generative AI, and this work is based on their thinking.

It's important for educators to design tasks that not only align with the specific cognitive skills of each Bloom's Taxonomy level but also incorporate elements that challenge the unique capabilities of AI. Tasks should emphasize the development of skills that are distinctly human, such as creativity, critical thinking, and ethical judgment, making it less feasible for AI to entirely replace the learner's engagement and effort. This means that an educator who chooses not to allow the use of AI in their classroom can rework their lessons and assessments in ways that will make it difficult, if not impossible, to use AI to achieve the desired outcome.

Bloom's Level	AI capabilities	Unique human skills	Task design strategies to avoid reliance on Generative AI
<p>Remembering</p> <p>Learners are asked to retrieve relevant knowledge from long-term memory.</p>	<p>AI can remember facts, terms, definitions, dates, etc. by accessing large databases.</p>	<p>Humans can remember information in a meaningful way by connecting it to prior knowledge, personal experiences or emotions based on context.</p>	<p>Design tasks requiring learners to recall information in a specific context or situation that relates to their own lives or interests rather than just stating the facts.</p>
<p>Understanding</p> <p>Learners are asked to comprehend the meaning of information, including interpreting, summarizing, or paraphrasing.</p>	<p>AI can understand the meaning of words, sentences, paragraphs or texts by using natural language processing techniques such as parsing, semantic analysis or sentiment analysis.</p>	<p>Humans can understand the meaning of texts and discern subtleties and nuances beyond the literal level by using inference, interpretation or critical thinking skills.</p>	<p>Create tasks that demand critical thinking, personal insights, or real-world application beyond factual understanding. Ask students to demonstrate their understanding of texts by asking them to paraphrase, summarize, compare, contrast or explain them in their own words.</p>
<p>Applying</p> <p>Learners are asked to use acquired knowledge in new situations, applying it to solve problems or complete tasks.</p>	<p>AI can apply rules, formulas, algorithms or procedures to solve problems or perform tasks by using logic, computation or optimization techniques.</p>	<p>Humans can apply knowledge or skills to new situations or complex problems or tasks that require creativity, intuition or judgment.</p>	<p>Develop tasks that require context-specific application or hands-on skills. Ask learners to apply their knowledge or skills to real-world scenarios or challenges that are relevant, authentic and meaningful.</p>

<p>Analyzing</p> <p>Learners are asked to break down information into parts to understand its organizational structure, identifying motives or causes.</p>	<p>AI can analyse data, information or texts by using methods such as classification, clustering, regression or sentiment analysis.</p>	<p>Humans can analyse data, information or texts by using methods such as synthesis, evaluation, argumentation – in other words, through critical thinking.</p>	<p>Construct tasks that involve nuanced interpretation, synthesis, or evaluation, requiring human judgment and interpretation.</p> <p>Ask learners to analyse data, information or texts by asking them to identify patterns, trends, relationships, causes, effects or implications.</p>
<p>Evaluating</p> <p>Learners are asked to make judgments about the value of ideas, information, or methods. Critique, appraise, or judge the worth based on specific criteria.</p>	<p>AI can evaluate the quality, validity or reliability of data, information or texts by using metrics such as accuracy, precision, recall or F1-score, a measure of accuracy in machine learning.</p>	<p>Humans can evaluate the quality, validity or reliability of data, information or texts by using criteria such as relevance, credibility, bias, perspective and ethics.</p>	<p>Design tasks with subjective elements, personal opinions, or ethical considerations.</p> <p>Ask students to evaluate data, information or texts by asking them to justify their opinions, decisions or choices based on evidence and reasoning.</p>
<p>Creating</p> <p>Learners are asked to generate new ideas, products, or ways of viewing things. Synthesize information from various sources to produce a unique and original outcome.</p>	<p>AI can create new data, information or texts by using methods such as generation, transformation or augmentation.</p>	<p>Humans can create new data, information or texts by using methods such as innovation, invention or originality.</p>	<p>Emphasize tasks involving open-ended problems, complex projects, or creative expressions that require human ingenuity and imagination.</p> <p>Ask learners to create new data, information or texts by asking them to produce something that is novel, useful and meaningful.</p>

In essence, if the goal is to prevent learners from relying on AI to complete tasks, emphasise the use of uniquely human skills like contextual discernment, social/cultural awareness, and ingenuity that AI cannot replicate. The key strategies include using:

- Open-ended tasks that require subjective judgment.
- Tasks that draw on personal experiences.
- Problems which have multiple valid solution paths.
- Tasks that need ethical/social reasoning.
- Creative work that needs the individual to express themselves and their individuality.

Task

Evaluate the extent to which these tasks are structured to encourage the development of skills that are less susceptible to being replaced or duplicated by current AI capabilities.

1. Compare and contrast two historical events, emphasizing their impact on society. Provide a written analysis that not only highlights the key differences and similarities but also explores the broader implications of each event.
2. Imagine you are a consultant for a fictional business facing specific challenges. Apply relevant business concepts you've learned to propose practical solutions. Create a presentation outlining your recommendations, considering the context and potential consequences of each suggestion.
3. Develop a multimedia project (e.g., a video, podcast, or interactive presentation) that explores photosynthesis. Include visualizations, real-world examples, and your own explanations to convey the topic in an engaging and educational manner.

AI Rules!

A company called MagicSchool (at magicschool.ai) has an important pop-up message when you first register. In addition to the important points about bias, accuracy, limits and privacy, they point out two things that should be rules for using AI.

1. The 80-20 Approach: Use AI for initial work, but make sure to add your final touch, review for bias and accuracy, and contextualize appropriately for the last 20%.
2. Your Judgement Matters: See AI-generated content as a starting point, not a final solution.

Using AI to personalise learners' education

It is possible to use AI's instant feedback and neutrality to provide learners with the right challenges, resources, and opportunities that they need. AI can adapt to where individuals are academically, creatively, and passion-wise. Setting clear guidelines will prevent over-reliance as AI supports personalized growth.

This will take some effort to set up and to get the learners up to speed on how to use the AI, but this time spent will reap rewards in the long term. Let's look at some ways teachers can use AI to personalize each learner's education.

Adaptive Learning Support

The aim here is to use AI as a virtual tutor that gives tailored explanations, examples, and practice based on an individuals' strengths, weaknesses, and pace.

There are some steps a teacher needs to take to set up using AI for adaptive learning support.

1. Get a picture of each learner's current skills and knowledge in the subject area through formal and informal assessments. Identify strengths and gaps. Now before you think this is a non-starter because of how much work it is remember that you have AI on your side. You can use something like Google Forms to automatically mark some of the assessments and gather information. You can then analyse the information you need.
2. Based on the information you have about each learner, draw up a learner profile. Develop prompts the learners can use to request practise questions tailored to their needs. (Please see below where we talk about suitable prompts.)

3. Have learners work individually when using the AI. Make sure they know how to ask the AI for assistance for anything they do not understand. You are always around to assist.
4. Monitor the learners and adjust the prompts over time to increase difficulty in line with learner mastery.

The key is leveraging AI to provide targeted practice while continuing to monitor learner progress and understanding. AI allows responsive adjustments and remediation at scale. But human oversight ensures support stays personalized and focused on real skill development.

AI as interactive tutor

You will develop a prompt for each learner to use based on their profile. Here is a template you could use.

Sample Prompt

You are an expert Grade [INSERT the grade] [insert your SUBJECT] teacher. Please generate one question at a time on [INSERT TOPIC that you have identified as a weakness for the learner]. If I get it wrong give me the correct answer and an explanation. Then give me a similar question to check my understanding. If I get that right, move on to another question. Slowly build up the level of difficulty. After I get ten questions right in a row, generate a quick assessment for me to do.

The learner will input this prompt, and off they will go. This process will continue and you can monitor progress.

Using a prompt

At some point in the future, we will be able to create a data set of all our learners and our teaching that the AI will be able to access with a simple instruction like: Please tutor Jim. But until then, each learner will need to work with the conversational AI using prompts like the sample prompt above.

There are some basic steps to follow in using a prompt with your learners.

1. Write the prompt.
2. Test it.
3. Give each learner the prompt to copy and paste into the AI.
4. Watch the magic happen.

AI as inquisitive tutor

It is possible to achieve similar results to the interactive tutor we just looked at without the additional work to set up the learner profile. You can let the AI do this job for you. Let's look at a prompt you could use to achieve this.

Sample Prompt

Please tutor me using the following script.

Hello! I'm your friendly AI tutor. I'm excited to help you learn new things today! To start, what subject or topic would you like me to tutor you on?

Now I'd like to get a sense of your current knowledge level. Are you a high school student, university student, or a professional learning this topic?

Okay, and what do you already know about this topic? Please share a bit so I can understand where to start.

Fantastic, thank you for explaining your prior knowledge. I'll make sure to build on that foundation as I explain concepts to you. As we go through this, I'll adjust my explanations based on your responses, provide examples relevant to your knowledge level, and check frequently that you're understanding by asking questions. Please feel free to ask me questions too!

To explain a new concept, I'll break it down into smaller pieces first. Then I'll give examples and analogies to make it more concrete. I'll ask you questions to check your understanding and have you explain parts back to me. Learning something new often takes going through the material multiple times, so let me know if you need me to re-explain anything.

My goal is to guide you to generate your own understanding, not just give you answers. If you struggle with a concept, I'll give hints to put you on the right path. When you demonstrate full understanding by explaining ideas back to me, then we can move on. I'm here as your supportive tutor - let's get started learning!

Task

- Use the 'less structured tutor' prompt in your Class Notes to test how it works for you. Make any changes you think you need before giving it to your learners. Remember, you can also ask the AI to improve the prompt if you wish.

AI as reading aid

You can take a text and have the AI adjust the reading level of it to meet the different reading levels of learners in your class.

Sample Prompt

Please adjust the reading level of the text to [insert specific reading level or grade]. Make the content more accessible or advanced accordingly.

Compare the reading levels

This text from a United States of America College Level textbook on Geology from opengeology.org. It is an open educational resource. (Original text from <https://opengeology.org/textbook/11-water/>)

This is the original.

The water cycle

The water cycle is the continuous circulation of water in the Earth's atmosphere. During circulation, water changes between solid, liquid, and gas (water vapor) and changes location. The processes involved in the water cycle are evaporation, transpiration, condensation, precipitation, and runoff.

Evaporation is the process by which a liquid is converted to a gas. Water evaporates when solar energy warms the water sufficiently to excite the water molecules to the point of vaporization. Evaporation occurs from oceans, lakes, and streams and the land surface. Plants contribute significant amounts of water vapor as a byproduct of photosynthesis called transpiration that occurs through the minute pores of plant leaves. The term **evapotranspiration** refers to these two sources of water entering the atmosphere and is commonly used by geologists.

Water vapor is invisible. Condensation is the process of water vapor transitioning to a liquid. Winds carry water vapor in the atmosphere long distances. When water vapor cools or when air masses of different temperatures mix, water vapor may condense back into droplets of liquid water. These water droplets usually form around a microscopic piece of dust or salt called condensation nuclei. These small droplets of liquid water suspended in the atmosphere become visible as in a cloud.

Water droplets inside clouds collide and stick together, growing into larger droplets. Once the water droplets become big enough, they fall to Earth as rain, snow, hail, or sleet.

Once precipitation has reached the Earth's surface, it can evaporate or flow as **runoff** into streams, lakes, and eventually back to the oceans. Water in streams and lakes is called surface water.

Or water can also **infiltrate** into the soil and fill the pore spaces in the rock or sediment underground to become **groundwater**. Groundwater slowly moves through rock and unconsolidated materials. Some groundwater may reach the surface again, where it discharges as springs, streams, lakes, and the ocean. Also, surface water in streams and lakes can infiltrate again to recharge groundwater. Therefore, the surface water and groundwater systems are connected.

Adjusted for grade 6 learners.

The water cycle

The water cycle, also known as the hydrologic cycle, is the continuous movement of water in the Earth's atmosphere. It involves water changing between solid (ice), liquid (water), and gas (water vapor) forms and moving from one place to another. There are several key processes in the water cycle:

1. **Evaporation:** This is when a liquid, such as water, turns into a gas. It happens when the sun's energy heats the water, causing its molecules to become excited and change into water vapor. Evaporation takes place from oceans, lakes, streams, and the Earth's surface. Plants also release water vapor through tiny openings in their leaves, a process known as transpiration. When considering both evaporation and transpiration, geologists use the term "evapotranspiration" to describe the total amount of water entering the atmosphere.
2. **Condensation:** Water vapor, which is normally invisible, can change back into a liquid through condensation. This occurs when water vapor cools down or when air masses with different temperatures meet. Condensation often takes place around tiny particles like dust or salt, called condensation nuclei. These small liquid water droplets can come together to form visible clouds. Within clouds, water droplets collide and merge, growing into larger droplets.
3. **Precipitation:** When water droplets in clouds become large enough, they fall to the Earth's surface as various forms of precipitation, including rain, snow, hail, or sleet. These different forms of water return to the ground.
4. **Runoff:** Once precipitation reaches the Earth's surface, it can take two paths. It may either evaporate back into the atmosphere or flow into streams, lakes, and eventually return to the oceans. Water that flows on the Earth's surface, like in streams and lakes, is referred to as surface water. It can also soak into the ground, filling the spaces between rocks and sediments to become groundwater. Groundwater moves slowly through the Earth's subsurface materials. Some of it may resurface through springs, streams, lakes, or return to the ocean. There is a connection between surface water and groundwater, as water from streams and lakes can seep into the ground, replenishing groundwater.

Understanding the water cycle is crucial for studying Earth's weather, climate, and the availability of freshwater resources. If you have any questions or need further clarification, feel free to ask!

Adjusted for grade 4 learners who do not speak English as a first language.

The Water Cycle - Water's Amazing Journey

Water is incredible! It goes on an adventure all around the Earth. Sometimes, it's a solid like ice, other times it's a liquid like the water we drink, and sometimes it turns into invisible water vapor, like steam.

Here's how it works:

1. **Evaporation:** Imagine the sun shining on a puddle of water, a river, or even the sea. The sun makes the water get really warm, and then something magical happens. The water starts turning into tiny, invisible pieces called water vapor. It's like water disappearing into the air.
2. **Condensation:** Water vapor, which is like invisible water, likes to gather together. When it gets cold, it comes back together and turns into little drops of water. These tiny drops can form clouds. So, clouds are like a big bunch of these little water drops hanging in the sky.
3. **Precipitation:** Sometimes, these drops in the clouds get heavy and fall down as rain, snow, or hail. That's when we need our umbrellas! It's like the sky is sharing water with the Earth.
4. **Runoff:** The water that falls on the ground can do different things. It might soak into the ground, like when you water plants, or it can flow in rivers and streams. This water eventually goes back to the big oceans.

So, water is always on the move. It can be in the sky as clouds, on the ground as rivers and lakes, or even hiding underground as groundwater. The Earth's water is always going on this amazing journey, and we need it for many things, like drinking, growing plants, and making our world a wonderful place!

If you have any questions or want to know more, just ask! Water is fascinating, isn't it?

Reflection

- Do you feel that AI could assist you in personalising your learners' journey using this technology? If not, what do you need more information on?
- If yes, try one or both of the prompts provided to see what results you get. Use what you have already learned to enhance the prompt to meet your needs

Using AI to create effective explanations, examples and analogies

As teachers we often have to introduce a new topic to a class that they have little or no pre-knowledge of. It can be quite tricky sometimes to come up with a suitable explanation, example or analogy that will make the process of understanding easier for them.

A prompt to create explanations, examples and analogies

You can use generative AI to create explanations, examples and analogies.

1. Open ChatGPT.
2. Paste Prompt 1 (below) into the Send a message box.
3. Answer the questions.
4. Copy and paste the output into a document.
5. Evaluate and use when you are satisfied.

Prompt 1

Introduction:

You are an education expert. Please help me develop effective explanations, examples and analogies for my class.

Questions:

Ask the following questions one at a time to get details about what I need .

1. What grade/age are the learners? What prior knowledge do they have about this topic?
2. What specific concept or topic do you want me to explain?
3. How does this concept fit into the broader curriculum?
4. What can you share with me about your learners that will help me tailor and contextualize the explanation?

When providing assistance on explanations:

Structure the explanation clearly into 3 parts:

1. Introduction – Provide context, state what will be covered, and relate it to what learners already know.
2. Body – Focus on core concepts. Define terms before building on them. Use Plain language.
3. Conclusion – Recap major points and check for understanding.

When providing assistance with examples:

Provide 2–3 specific, concrete examples that relate to the learners' experiences. Explain how each example illustrates the key points.

When providing assistance with an analogy:

Select a simple, familiar domain and clearly explain the similarities that map to the target concept.

Follow up:

Ask if the teacher would like anything clarified or expanded on. Offer to address any common misconceptions.

Prompt 2 - An alternative prompt

I need assistance with my [insert topic]. Give me explanations of the terms, any examples and an analogy to explain the difficult concepts.

Task

- Compare the reply given to each of the two prompts.
- Which is better? Why do you say so?

Output from Prompt 1

Thank you for specifying the topic, which is "The Nuclear Age and the Cold War (1945 – 1990)" in the field of social sciences and history. Given that your Grade 9 students are being introduced to this subject, I'll make sure to provide a clear and engaging explanation.

****Introduction:****

Today, we're going to embark on a fascinating journey back in time to explore a pivotal period in history - "The Nuclear Age and the Cold War," spanning from 1945 to 1990. This era was marked by significant global events, and our goal is to understand the context, key players, and the impact it had on the world. Your prior knowledge of history will serve as a great foundation for our exploration.

****Body:****

Let's start with some essential concepts:

- ****The Nuclear Age:**** This was a time when the world witnessed the development and use of atomic and nuclear weapons. We'll discuss the science behind these weapons and the profound effect they had on international relations.
- ****The Cold War:**** Imagine a period of intense political and military tension without direct warfare between major powers, such as the United States and the Soviet Union. This was the Cold War. We'll delve into the causes, strategies, and events that defined this era, including the arms race and the space race.

****Examples:****

1. To help you relate to the concept of the arms race, think of it as a competition between two countries, like a high-stakes game of chess, where each side tries to outdo the other in terms of military strength. This led to the stockpiling of nuclear weapons, which was a significant characteristic of the Cold War.
2. Picture the space race as a thrilling competition similar to a race between two athletes. The United States and the Soviet Union raced to achieve milestones in space exploration, such as sending the first human into space and landing on the moon. This competition had political and technological implications during the Cold War.

****Analogy:****

Think of the Cold War as a long, tense standoff between two groups, like two rival sports teams. While they never directly clashed on the field, the rivalry and competition between them were intense, affecting not only the teams but also the spectators and the world at large.

****Conclusion:****

To sum up, “The Nuclear Age and the Cold War” is a captivating chapter in history. By the end of this lesson, you will have a solid foundation for understanding the significant events and dynamics of this period. Remember, history is not just about dates and facts; it’s about understanding the stories and consequences behind those events.

Before we begin, do you have any specific questions or concerns, or is there anything else you’d like to add or emphasize in this lesson?

Prompt: I think the learners will need some explanation about what nuclear means, particularly in relation to the nuclear age.

Certainly, explaining the term “nuclear” is a fundamental step, especially for students who are being introduced to the topic of the Nuclear Age. Let’s add that clarification to our explanation:

****Body (Updated):****

Now, let’s start with an important definition:

- ****Nuclear:**** When we talk about the “nuclear” age, we’re referring to anything related to atomic nuclei. At the core of every atom, there is a nucleus, which contains protons and neutrons. In the context of the Nuclear Age, “nuclear” often refers to the use of the energy and destructive power that can be harnessed from changes within these atomic nuclei.
- This energy can be released in a controlled manner to generate electricity in nuclear power plants, or in an uncontrolled way in the form of nuclear weapons, which are capable of producing extremely powerful explosions.
- During the Nuclear Age, countries developed and tested nuclear weapons, which became a central element in the Cold War’s arms race. These weapons are incredibly powerful and have the potential to cause widespread destruction.

To make this concept more tangible, let’s consider a simple analogy:

****Analogy (Updated):****

Think of an atomic nucleus as the engine of an incredibly powerful vehicle. In the Nuclear Age, scientists learned how to harness the energy produced by this “engine.”

It's like learning to control the engine of a car, which can be used for both peaceful purposes, like driving safely to your destination (as in nuclear power plants), or for more destructive purposes, such as speeding dangerously (as in nuclear weapons).

This clarification should provide the students with a basic understanding of what "nuclear" means in the context of the Nuclear Age. Is there anything else you'd like to add or any questions you anticipate your students might have?

Prompt: How can I get the learners to understand that the Cold War was not actually a war like they would think with countries actually fighting.

Helping learners understand that the Cold War was not a conventional war with countries fighting on the battlefield is crucial for grasping this historical period. Here's an approach to clarify this concept:

Body (Updated):

Now, let's delve deeper into the concept of the Cold War, an essential aspect of our topic.

- **The Cold War:** This term might sound a bit misleading, as it suggests a conflict where nations are actively engaged in fighting. However, the Cold War was quite different from traditional wars. It was a period of intense rivalry, tension, and competition, but the key distinction is that there was no large-scale, direct military confrontation between the major powers involved.

- Instead of battlefield combat, the Cold War was characterized by diplomatic manoeuvring, espionage, propaganda, and a significant focus on building up military capabilities without using them in a full-scale war. This period saw a range of political, economic, and ideological conflicts between the United States and the Soviet Union, along with their respective allies.

To illustrate this concept and make it more relatable to the learners, consider this analogy:

Analogy (Updated):

Think of the Cold War as a high-stakes game of chess. In a chess match, two opponents are in intense competition, constantly strategizing, and making moves to outmanoeuvre each other. However, in this "chess game," neither side directly attacks the other's king, and there are no actual battles on the board. The players are in a constant state of tension, with the threat of potential moves, but without open warfare.

Conclusion:

By understanding this important distinction, your students will have a clearer picture of what the Cold War was and how it differed from traditional wars. It was a war of ideologies, influence, and competition, but it didn't involve the large-scale military conflicts we might associate with a typical war.

Before we proceed, is there anything else you'd like to add or any questions you anticipate from your students about the nature of the Cold War?

Output from Prompt 2

Of course, I'd be happy to assist with your Grade 9 history topic on "The Nuclear Age and the Cold War (1945 – 1990)" by providing explanations, examples, and analogies for key concepts.

1. Explanation of Terms:

- **The Nuclear Age:** This period is all about the discovery and use of nuclear energy. At the heart of every atom is a tiny, powerful part called the nucleus. During the Nuclear Age, people figured out how to use this nucleus to create energy, which can be used for peaceful things like making electricity or for destructive purposes like making very powerful bombs known as nuclear weapons.

- **The Cold War:** Despite its name, the Cold War wasn't a hot or shooting war like World War II. It was more like a long, intense, and often scary rivalry between two superpowers, the United States and the Soviet Union, along with their allies. Instead of fighting directly, they competed in other ways, like spying on each other, showing off their military power, and trying to influence other countries.

2. Examples:

- **The Nuclear Age:** Imagine nuclear power plants. They work like giant teapots, using the heat generated by splitting atomic nuclei to make steam and turn turbines, which creates electricity. It's just like heating water in a teapot to make steam that powers a machine.

- **The Cold War:** Think of it as a tense standoff, a bit like when two people are playing a game of chess, where they're constantly moving their pieces, making threats, and trying to outmaneuver each other. However, in this game, they never actually take each other's chess pieces, and there's no final showdown. They're just always on edge, making calculated moves.

3. Analogy:

- **The Cold War Analogy:** Picture a chessboard. In a regular chess game, the goal is to capture the opponent's king. But during the Cold War, it's like the players are so afraid of losing that they never actually capture each other's kings. They just keep moving pieces and making threats, without a real battle. It's a war where the players are too cautious to fight directly.

Understanding these concepts should give your Grade 9 students a clear foundation for learning about the Nuclear Age and the Cold War. If you have more specific questions or need further assistance, please feel free to ask.

Using AI for planning

Term and lesson planning is an important part of a teacher's work to ensure that learners receive an education that is well-structured and meets the needs of the curriculum. This can be a time-consuming process, but with generative AI you can do this a lot more quickly.

There's an AI for that

Using the advancements in deep learning that have made generative AI more accessible and powerful, developers have been able to build applications on top of the generative AI large language model.

What this means is that instead of having to create a prompt, we are able to input information into a pre-written prompt that the developer has created in an app. It is like filling in a form, and then the app works with the generative AI that it is based on to give us a response. This allows for very specialised AI apps to have been developed.

magicschool.ai

Magicschool.ai is a web-based app that at the time of writing is free. The app aims to assist teachers with the high admin demands placed on them.

Creating a lesson plan

You can create a lesson plan with AI.

1. If you have not done so already, create a MagicSchool account at magicschool.ai.
2. Log into MagicSchool.
3. In tools scroll down and look for lesson plan generator. (You can also type lesson plan generator in the search bar and it'll pop up.)
4. Click on lesson plan generator.
5. Enter the Grade.
6. Say what you are teaching.
7. Add any additional context, for example, what prior knowledge the learners have, how long the lesson should be, any particular headings you want in the lesson plan or any other information.
8. Ignore Standards Set to Align to as unfortunately it does not connect to CAPS yet.
9. Click generate.

10. If you want to add in anything else like a formative assessment quiz, you can click on Ask Raina. The AI will focus on the lesson plan you have just constructed.
11. Click the Copy icon and paste the lesson plan into a word processor document.
12. Evaluate the lesson plan.

Lesson plan from MagicSchool

Objective: Students will be able to understand the overall concept of economics and its significance in society.

Assessment:

Class discussion: Students will actively participate in a class discussion on the importance of economics, providing examples and explanations.

Written reflection: Students will write a reflection on the importance of economics in society, highlighting key concepts discussed in class.

Key Points:

- **Definition of economics:** Explain what economics is and its role in society.
- **Description and elements:** Discuss the components of economics, such as scarcity, resources, and decision-making.
- **Branches of economics:** Explore different branches of economics, such as microeconomics and macroeconomics, and their focus areas.
- **Approaches of economics:** Introduce different economic approaches, such as Keynesian economics and supply-side economics.
- **Examples and analogies:** Provide relevant examples and analogies to help students understand difficult concepts.

Opening:

Engage students by asking the question, “Why do you think money is important in our daily lives?” Discuss their responses and connect them to the broader concept of economics.

Introduction to New Material:

Present the key points of the lesson using visual aids, real-life examples, and engaging discussions. Anticipate the common misconception that economics is only about money and clarify that it encompasses broader concepts.

Guided Practice:

Set behavioral expectations for the work time and provide opportunities for students to practice with examples. Scaffold questioning from easy to hard, ensuring students grasp the key concepts. Monitor student performance through observation and providing feedback.

Independent Practice:

Set behavioral expectations for independent work time. Assign an activity aligned with the objective, such as analyzing a news article related to economics and writing a short summary highlighting its significance.

Closing:

Summarize the main points of the lesson through a quick closing activity. For example, ask students to create a concept map or complete a short quiz on the key concepts discussed.

Extension Activity:

For students who finish early, provide an extension activity such as researching and presenting on a specific branch of economics or analyzing the economic impact of a current event.

Homework:

Suggest a homework activity where students can research and find examples of economic principles in their local community or analyze the economic policies of a specific country.

Task

- Sign up for magicschool.ai.
- Experiment with the lesson planning feature.
- Will you keep using it? Why do you say this?

Developing content with AI

As you would expect, as long as you are not looking for information after September 2021, the generative AI solutions we have been speaking about are able to help you generate content.

It is possible to use the AI as if it were an internet search, and you can even get it to write the output at the right grade and language level for your learners within the curriculum's demands if your prompt is well-engineered.

However, we can use generative AI to improve content that we have, rather than generating new content. We are going to rely on MagicSchool for this assistance.

A conceptual understanding generator

You can get assistance from AI on how to develop conceptual understanding in a difficult topic.

1. Log into MagicSchool.
2. In tools click on the Intellectual Prep filter.
3. Scroll down and look for Conceptual Planning Generator.
4. Click on Conceptual Planning Generator.
5. Enter the Grade.

6. Say what you are teaching.
7. Add any additional context, for example, what prior knowledge the learners have, how long the lesson should be, etc.
8. Click generate.
9. Evaluate the information.
10. If you want to add in anything else like a formative assessment quiz, you can click on Ask Raina. The AI will focus on the output you have just generated.
11. Click the Copy icon and paste the output into a word processor document.

A misconception generator

You can get assistance from AI on how to assist learners with known misconceptions that arise when teaching particular topics.

1. Log into MagicSchool.
2. In tools scroll down and look for the misconception generator. (You can also type misconception generator in the search bar and it'll pop up.)
3. Click on misconception generator.
4. Enter the Grade.
5. Say what you are teaching.
6. Click generate.
7. Evaluate the information.
8. Click the Copy icon and paste the output into a word processor document.

Using AI to create assessment tools

Assessment is an important part of teaching, but creating assessments can take a lot of time.

Multiple Choice Assessment Generator

You can get assistance from AI to generate a quick set of multiple choice questions using a text that you have.

1. Copy your text and paste it into a document. This will keep the text in the clipboard of your laptop.
2. Log into MagicSchool.

3. In tools scroll down and look for the Multiple Choice Assessment Generator. (You can also type Multiple Choice Assessment Generator in the search bar and it'll pop up.)
4. Click on Multiple Choice Assessment Generator
5. Enter the Grade.
6. Say how many questions you want.
7. Paste the text into the box.
8. Click generate.
9. Evaluate the information.
10. Click the Copy icon and paste the output into a word processor document.

Multiple Choice Quiz using Chat GPT

You can paste this prompt into Chat GPT.

Sample Prompt

You are an expert in school assessment.
Please create a multiple-choice quiz for the following text.
Create five questions.
Each question must have three possible answers.
Do not include answers like 'all of the above'.
Provide an answer key.
[INSERT TEXT]

Rubric generator

You can get assistance from AI to generate a rubric.

1. Log into MagicSchool.
2. In tools scroll down and look for the rubric generator. (You can also type rubric generator in the search bar and it'll pop up.)
3. Click on rubric generator.
4. Enter the Grade.
5. State the Standard or Objective that the rubric is going to be based on.
6. Give the assignment a title.
7. Write a description of the assignment.
8. Select a point scale. This is most often 5 points.
9. Add in anything else that you specifically want evaluated.

10. Click generate.
11. Evaluate the information.
12. You can shorten the rubric by clicking the button below the rubric.
13. Click the Copy icon and paste the output into a word processor document

Task

- Use a rubric that you have created before as your base. Create a rubric with MagicSchool for the same topic.
- Compare your rubric to the AI's output.
- What are your thoughts about using the AI to create future rubrics for you?

Using AI to animate

AI has the ability to create animations from drawings. The AI in this section will be a useful tool to introduce younger learners to AI.

Animated Drawings

You can use AI to animate a drawing.

1. Draw a single character on a sheet of white paper. There should be no lines or writing on the page.
2. Take a photograph of the drawing making sure that it is clear and well-lit with no shadow.
3. Email the photograph to your computer and save it. You will need to upload it later.
4. Open your browser and go to <https://sketch.metademolab.com/>
5. Click Get Started
6. Click +Drawing
7. Click Upload Photo
8. Find it on your computer and click Open.
9. Click Next.
10. Decide if you would like to allow the company to access your drawings for research purposes or not. Click Agree or Disagree.
11. If necessary adjust the blue rectangle to include your whole drawing and click Next.

12. Use the tools to make any adjustments to the drawing. Click Next.
13. Check the points are at all parts of the image. Click Next.
14. Choose the different animations and choose your favourite.
15. Click Share and follow the prompts to share.

Task

- Create your own animation using Animated Drawings and share it with your class.

About the Final Assessment



At the end of this training session, you will be asked to complete the Final Assessment.

If you complete the Final Assessment successfully, you will qualify for your virtual badge and certificate. You can see a sample here.



Final Assessment

Indicate the **ONE** correct response for each question.

1	In Professor Tanja Bosch's research, how do South African university students view Generative AI?
a	As a tool for total substitution of their work.
b	As a supplement to enhance their work.
c	As a threat to academic integrity.
2	According to Bloom's Taxonomy Revised (Reviewed for AI), what is a task design strategy to avoid reliance on Generative AI for the Understanding level?
a	Ask students to recall information in a specific context.
b	Create tasks that demand critical thinking and personal insights.
c	Emphasize tasks involving open-ended problems.
3	Which statement about how AI is expected to impact the role of human educators is not true?
a	AI will easily replace human educators entirely.
b	AI will automate routine tasks and enhance human capabilities.
c	AI will not have any impact on the role of human educators.
4	What is the main concern regarding the use of AI in the classroom?
a	Learners use it to cheat.
b	It enhances learner skills.
c	It has no impact on education.
5	What is a key strategy mentioned for designing tasks that encourage the development of skills less susceptible to AI replacement?
a	Tasks with a single valid solution path.
b	Tasks requiring only factual understanding.
c	Open-ended tasks that require subjective judgment.

Final Assessment (continued)

Indicate the ONE correct response for each question.

6	Why is verifying information from AI sources important?
a	To be honest, it's not important.
b	AI sources never provide inaccurate information.
c	To empower students to be discerning consumers of information.
7	Which of the following is NOT a practical strategy for crafting educational prompts?
a	Being specific
b	Using guiding words
c	Avoiding any changes to the prompt
8	In the CEDO model for prompts, what does the CEDO acronym stand for?
a	Context, Expertise, Data, Output
b	Clarity, Expertise, Delivery, Output
c	Context, Expert Persona, Task, Output
9	According to Bloom's Taxonomy Revised (Reviewed for AI), what is an example of an AI capability at the "Creating" level?
a	Generating new ideas and products.
b	Analysing data to identify patterns.
c	Recalling relevant knowledge from long-term memory.
10	At the Analysing level of Bloom's Taxonomy, what is a task that AI can perform?
a	Break down information into parts using critical thinking.
b	Analyse data, identify patterns, and categorize outputs.
c	Evaluate the quality of ideas based on specific criteria.
11	What are the key elements of educational prompts?
a	Clarity, relevance, and context
b	Length, format, and style
c	Subject matter, colours, and shapes

Final Assessment (continued)

Indicate the ONE correct response for each question.

12	What is the purpose of the conceptual understanding generator tool in MagicSchool?
a	To generate ways in which an educator can assist learners in understanding new or difficult concepts.
b	To assist learners with common misconceptions.
c	To replace traditional assessment methods.
13	What is the purpose of the misconception generator tool in MagicSchool?
a	To generate multiple-choice questions.
b	To assist learners with common misconceptions.
c	To replace traditional assessment methods.
14	Which of these is the best reason to use AI in education?
a	To prepare learners for the real world.
b	To make learners pass the final exams.
c	To give educators a rest.
15	What is a unique human skill highlighted in the Creating level of Bloom's Taxonomy that AI cannot easily replicate?
a	Applying rules, formulas, and algorithms to solve problems.
b	Generating new ideas, products, or ways of viewing things.
c	Comprehending the meaning of information through interpretation.

Acknowledgements

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Alfmaler/freepik.com, Premium license (Unlimited use without attribution)	Vector cute white modern levitating robot waving hand and with happy face flat vector illustration isolated on
Author created animations with Animated Drawing	Via Afrika
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