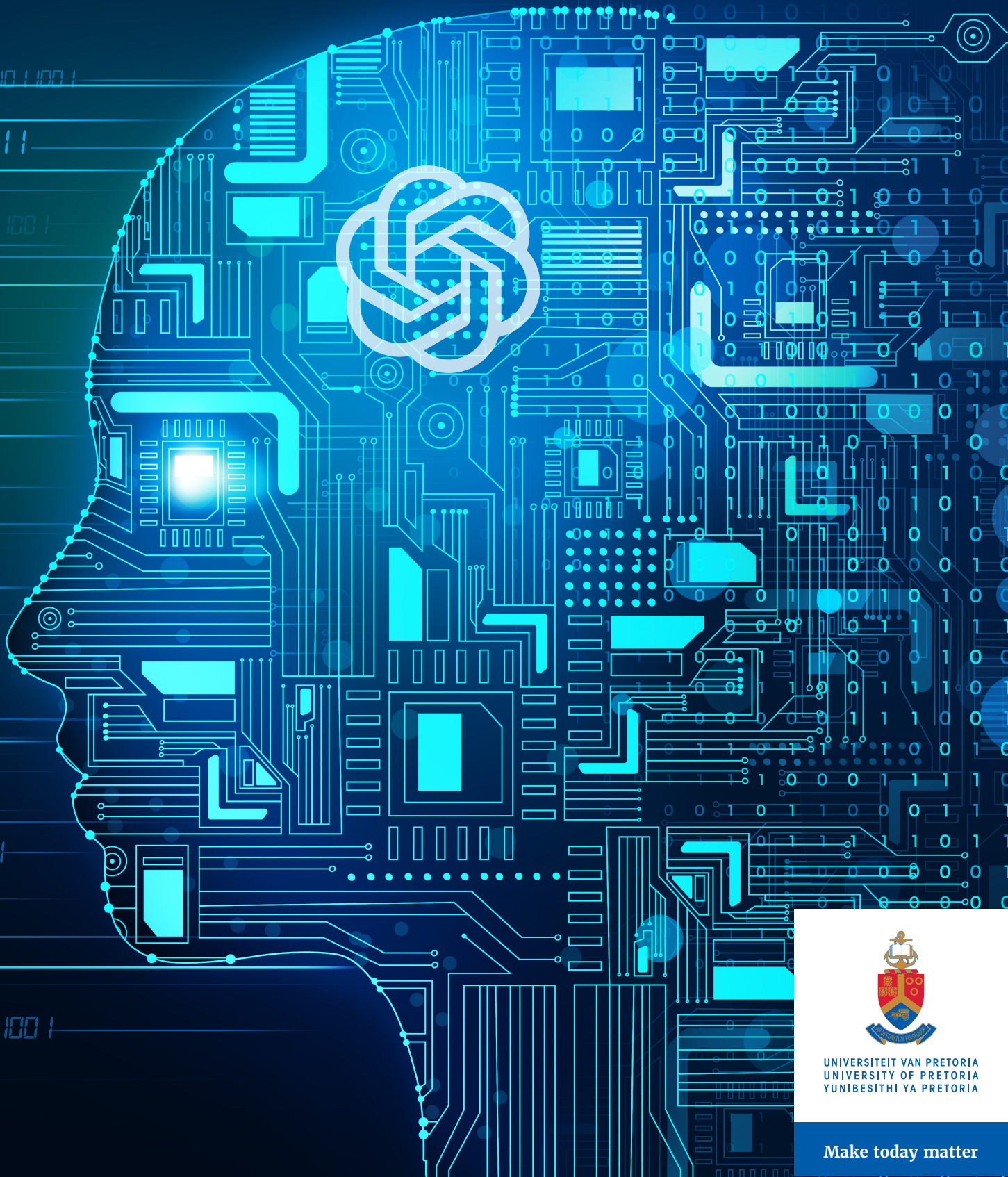
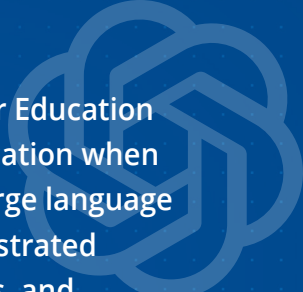


# Guide for ChatGPT usage in teaching and learning



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ChatGPT escalated the conversation on the impact of Artificial Intelligence in Higher Education when it was activated in November 2022. It disrupted the status quo in Higher Education when students started using it to write their essay submissions. ChatGPT is a powerful large language model (LLM) that mimics human conversation. Large language models have demonstrated impressive results in identifying language patterns and predicting contextual words, and ChatGPT excels at generating coherent and relevant textual responses with minimal input from the user. By leveraging its extensive database of trained language patterns, ChatGPT can provide generated textual responses that accurately reflect the context of the user's input. These generative Artificial Intelligence (AI) technologies can be helpful for academics and students, providing personalised and adaptive learning experiences, improving student engagement, and reducing the burden on educators and administrators. However, these disruptions have also prompted educators to reconsider their teaching, curriculum, and assessment. It is essential to assess the benefits and limitations of these AI technologies carefully, including potential ethical concerns, and to adapt teaching strategies to ensure they align with the changing landscape of educational technology.

ChatGPT is an easy-to-use AI tool that can assist with writing poems, coding, essays, and solving mathematical equations. Best of all, it is currently available for free.

AI holds immense promise in enhancing our productivity and learning. Nonetheless, it's important to note that ChatGPT cannot understand the meaning of text, but rather generates text based on the relations between words it has latched onto during the training of its model. Thus ChatGPT should only assist learning and not act as a substitute for human creativity and critical thinking.

This guide which was developed with the help of ChatGPT and aimed to offer practical tips for lecturers and students to maximise the benefits and the ethical use of ChatGPT. To get started, it's important to familiarise yourself with ChatGPT and other AI tools. The URL for accessing ChatGPT is: <https://chat.openai.com/auth/login>. The free access to ChatGPT is sometimes unavailable due to high demand. However, Microsoft has launched a new version of its Bing search engine with built-in support for OpenAI's ChatGPT, which provides citations and uses updated data sources.



## General guidelines principles

When using generative AI like ChatGPT for teaching and learning at universities, it is important to follow some guiding principles to ensure that the technology is being used effectively and ethically. Here are some guiding principles that could be considered:

- **Clarify the purpose:** The use of generative AI like ChatGPT should be aligned with the goals of teaching and learning, and the purpose should be clearly defined. It should be used to enhance learning outcomes and provide additional support to students, not to replace human interaction.
- **Emphasize critical thinking:** While generative AI like ChatGPT can provide helpful information, it should not replace critical thinking. It is important to encourage students to evaluate the information they receive and to develop their own ideas and perspectives.
- **Provide guidance and communicate rules:** Students should be guided on how to use generative AI like ChatGPT effectively. This includes understanding how to interpret the results, how to use the

technology to enhance their learning, and how to avoid potential pitfalls. Communicate your rules regarding using ChatGPT in your study guide and explain how to properly acknowledge its use.

- **Ensure transparency:** It is important to be transparent about using generative AI like ChatGPT with students. This includes explaining how the technology works, what data is being collected, and how it will be used.
- **Respect privacy:** Using generative AI like ChatGPT should respect the privacy of students. Any data collected should be stored securely and only used for the intended purpose.
- **Openly discuss the ethical implications:** Discuss the ethical implications of ChatGPT openly and encourage discussions about its limitations and potential biases, implications on copyright, concerns about labour, environmental impacts, data rights, etc. It is important to critically evaluate the quality of results and to use it in accordance with academic integrity policies.
- **Avoid using personal or confidential data:** To ensure compliance with data privacy laws, it is important to avoid using ChatGPT for personal or confidential data. The model learns from its interactions, which may include sensitive information, and treats it as public domain data.
- **Explain how ChatGPT works:** Explain to your students that ChatGPT generates statistically likely word sequences based on a database and that ChatGPT does not understand, think or reason. ChatGPT is a tool to support learning and not a replacement for their own creativity and thinking.
- **Cross-check information:** Look for other sources and check for the accuracy and credibility of Chat GPT answers. Use Chat GPT as a supplement to other credible sources of information and not as your only source.

By following these guiding principles, the use of generative AI like ChatGPT can be a valuable tool for teaching and learning at universities.



### Hints on how to improve your prompt (input) and receive the desired result

If you are new to using ChatGPT, it may be helpful to have some hints on how to improve your prompt (input) and receive the desired result:

Hint	Examples of ChatGPT prompt (input)
Be clear, concise and specific	Explain the concept of blockchain technology in simple terms?
Provide context	What are some effective study techniques for someone preparing to take a biology exam
Ask follow-up questions	Explain more about how they work?
Specify the language output	Respond in UK English
Specify the length of the response	I would like a brief/detailed/300 words response (the maximum is about 3000 words)
Specify the response format	Present your response in bullet points/table/paragraph
Specify the level of output	Respond suitable for a second-year university student” or “an A-rated student,” or “I would like an in-depth analysis.
Specify the tone/style of the output	Write my text in the style of Shakespeare.

Here is an example of a possible prompt: *"Write a one-page essay about the supernatural role in Macbeth and to what extent it motivated Macbeth's actions in UK English for a second-year university student."*



## Use ChatGPT to improve teaching and learning by lecturers

There are several ways in which ChatGPT can be utilised to enhance teaching, learning, assessment, and student support. When lecturers use ChatGPT effectively, it can enhance students' comprehension, foster critical thinking skills, and aid them in their own planning.

### **Enhance students' critical thinking abilities**

Below are some recommendations on how lecturers can utilise ChatGPT to enhance students' critical thinking abilities:

- Actively teach students what critical thinking entails in your discipline at the appropriate NQF level of the module.
- Requiring students to submit a ChatGPT version of the assignment, including the prompts, and their reflection/critique on the ChatGPT version based on the course material provided and their own final assignment in track changes.
- Use ChatGPT to generate varied viewpoints and prompt students to compare and critically evaluate them by:
  - Identifying the assumptions
  - Evaluating the soundness of arguments
  - Evaluating the reliability of sources and evidence presented
  - Identifying common logical fallacies that can weaken an argument
- Use ChatGPT to generate questions that challenge assumptions.
- Encourage students to develop assessment criteria/rubrics for evaluating the ChatGPT responses.
- Use ChatGPT to create multiple versions of an essay or research paper and identify areas for further development. Have students work in groups to compare, discuss, rate, and debate their ChatGPT prompts/responses and rank them from best to worst.
- Provide a mind map for each assignment or have students explain their thought processes.
- Prompt students to reflect on their learning about the topic using ChatGPT.
- Emphasise problem-solving in the assignments.

### **Use ChatGPT to improve your teaching**

Below are some suggestions for how lecturers can utilise ChatGPT to enhance their teaching:

Task	Examples of ChatGPT prompt (input)
Create lesson plans	Design a comprehensive lesson plan for a first-year philosophy class focusing on the contrasting views of Kant and Plato on reality. The plan should include an assessment task and a memorandum for students, a challenging group assignment that requires higher-order thinking, and a clear rubric to evaluate the assignment.

Write lesson outcomes	I am a first-year university lecturer and I need to write clear and measurable outcomes for my upcoming lesson on genetics. Write specific outcomes in the following format: 'By the end of this unit, students will be able to describe the scientific methods and provide examples of its application'.
Develop a worksheet	I am a university lecturer teaching second-year French, and must create a worksheet for my students to practice their vocabulary. Create a worksheet with some exercises, activities, problems, and a group-work activity.
Create PowerPoint slides	I am a third-year history lecturer and must create a PowerPoint presentation for my upcoming lesson on World War II. Create ten engaging and informative slides to enhance my student's learning experience.
Improve students' understanding	I am a grade 9 mathematics teacher and my students struggle with linear equations. Give me some tips on how to help improve their understanding of this concept.
Identify the big ideas of a course, unit, or lesson	I am a grade 12 high school English teacher creating a new unit on Shakespeare's Hamlet. Identify the big ideas for this unit.
Evaluate the output for correctness and completeness	Evaluate the correctness and completeness of the output.
Consider the student's perspective	Consider what your own reaction as a student would have been to being subjected to the content or assignment.

### ***Use ChatGPT to enhance planning activities related to teaching and learning***

Here are some recommendations on how ChatGPT can enhance planning activities related to teaching and learning:

Task	Examples of ChatGPT prompt (input)
Proofread written work and check for grammar, punctuation, and spelling errors	Proofread the following text: ...
Create PowerPoint slides for presentations	Create a ten-slide PowerPoint presentation on the topic of renewable energy
Summarise and theme your information	Provide a 300 words overview/summary/essay about the role of central banks in addressing macroeconomic challenges
Create an Excel formula to automate calculations	Create an Excel formula to calculate the average of a range of cells

Solve mathematical equations and explain the steps	Solve the following quadratic equation: $x^2 + 5x + 6 = 0$ and explain the steps
Provide an overview of complex lengthy concepts	Can you provide an overview of the concept of quantum mechanics?
Generate code for various programming languages and applications, from simple scripts to complex algorithms	Write a Python program that calculates the Fibonacci sequence
Summarise and theme information	Summarise the main themes in this set of student feedback for me. What are the key takeaways from these data points?
Create guidelines	Create a set of guidelines for effective project management based on these criteria ... What are the key elements that should be included in a social media policy?
Assisting in replying to emails	What is an appropriate response to this email from a colleague asking for feedback on a project?
Translate written work into different languages	Translate this report from English into Spanish. What is the French equivalent of this key term in my document? (Note that machine translation may not always be perfect, so it's important to double-check the output to ensure accuracy).



## Assessment and the impact of ChatGPT

Assessment is a critical component of higher education, as it makes students' learning visible and evaluates their progress towards specific learning outcomes. To enhance the integrity of assessments, a balance of formative and summative assessments over time, collected from multiple sources, is essential. Various tools and approaches, including technology-enhanced and online assessments, can provide new opportunities for assessing student learning. However, it is important to ensure that students use these tools in a way that enhances academic integrity and does not undermine it. The University of Pretoria's plagiarism declaration states "*I declare that this essay, report, project, assignment, dissertation, thesis, etc. is my own original work. Where other people's work has been used (either from a printed source, the internet or any other source), this has been properly acknowledged and referenced in accordance with the requirements as stated in the University's plagiarism prevention policy.*" ChatGPT has released a text classifier for AI-generated text (<https://platform.openai.com/ai-text-classifier>), while Turnitin is currently in the process of developing its own AI text classifier which will be available in the near future.

With the advancement of technology, particularly with ChatGPT, assessments should focus on higher-order levels such as applications, analyses, and problem-solving. Lecturers should design assignments that pose issues with no straightforward correct answer to encourage students to think critically and creatively. Incorporating authentic assessments as part of a module's assessment strategy will provide students with the opportunity to provide direct evidence that they can apply module content to solve

real-life problems through the execution of tasks. By adopting a more holistic approach to assessments and encouraging deeper learning, lecturers can create an environment that supports students' academic success and prepares them for future challenges.

There are various ways in which lecturers can use ChatGPT for various assessment-related purposes:

Task	Examples
Create quizzes and assessments	Prompt: "Create six multiple-choice questions to assess the students' understanding of integration from first principles in a first-year university mathematics course. Each question should be categorised according to Bloom's taxonomy, and the correct answer should be provided".
Essay marking	ChatGPT can provide an objective and consistent evaluation of students' essays, allowing lecturers to focus on providing more detailed feedback on content rather than grading. This saves lecturers time and enables them to use AI to give more personalised feedback to students.
Generate a summary of the problem areas of the assessment	After marking all essays with ChatGPT, ask it to generate a summary of the problem areas of the assessment so that you can improve your teaching.
Automated short-answer marking	ChatGPT can grade short-answer questions and provide instant feedback to students, allowing lecturers to focus on providing more in-depth feedback on more complex questions. This also saves lecturers time, allowing them to provide more timely feedback to students.
Personalised feedback	ChatGPT can analyse each student's work to identify individual strengths and weaknesses, allowing lecturers to provide targeted feedback for each student. This helps to improve students' learning outcomes and saves time in having to provide feedback for each student.
Language proficiency assessment	ChatGPT can assess each student's language proficiency level in a specific language, allowing lecturers to provide individualised language instruction and support. This saves time in having to evaluate each student's language proficiency manually.
Grade an essay based on a marking scheme	Generate a marking scheme for an essay for second-year university students; follow-up prompt: "Grade the following essay using the marking scheme: ...".



## Benefits of ChatGPT for students

Using ChatGPT can be a valuable tool for students who aim to enhance their learning experience at the University of Pretoria. As students progress through their studies, they are expected to develop various skills that are required in the workplace, such as self-motivation, professional communication, ethical practice, teamwork, and problem-solving abilities. It is important for students to utilise every assignment and assessment to learn their discipline and to develop these skills, as they are essential to the student in standing out as the best candidate during a job interview. ChatGPT can offer personalised recommendations and answer complex questions, making it a useful resource for students.

To make the most of ChatGPT, students can use it to gain a deeper understanding of various subjects. By exploring the features of ChatGPT, students can effectively utilise the tool to improve their academic performance. However, it is important for students to note the University of Pretoria's plagiarism declaration and to ensure that they use ChatGPT ethically and appropriately:

*"I declare that this essay, report, project, assignment, dissertation, thesis, etc. is my own original work. Where other people's work has been used (either from a printed source, the internet or any other source), this has been properly acknowledged and referenced in accordance with the requirements as stated in the University's plagiarism prevention policy."*

As responsible users of ChatGPT, students should prioritise ethical considerations, such as respecting privacy, avoiding discrimination, acknowledging sources of information, and critically evaluating the advice provided to ensure that their use of the technology benefits themselves and society as a whole.

### Uses of ChatGPT for students to enhance learning:

Task	Examples of ChatGPT prompt (input)
Summarise and theme your information	Provide a 300 words overview/summary/essay about the role of central banks in addressing macroeconomic challenges or use your own text.
Solve mathematical equations and explain the steps	Solve the following quadratic equation: $x^2 + 5x + 6 = 0$ and explain the steps. Then use these steps to solve equations with different values to practice solving these equations yourself.
Provide an overview of complex lengthy concepts	Can you provide an overview of the concept of quantum mechanics?
Generate writing prompts for creative writing assignments	Suggest a creative writing prompt for a short story involving time travel. Evaluate the suggestions and use one or a combination of these to write your own creative piece.
Get alternative phrasing for difficult-to-express ideas	I am having trouble expressing my argument for ... Rephrase my main points
Help with language learning and practising grammar and sentence structures	Give me an example of a complex sentence using the word 'notwithstanding'



Generate outlines for writing assignments	I have to write an essay about the causes of World War II. Can you help me create an outline to organise my ideas? Evaluate the output against the assignment requirements to make sure you address the main points.
Get feedback on written work	Provide feedback on my essay about climate change and suggest areas where I could improve.
Get formative assessment feedback on the quality of the language	Provide feedback on grammar and vocabulary usage of the following ...
Test preparation	Create six multiple-choice questions to assess my understanding of integration from first principles in a first-year university mathematics course. Remember that your lecturer might set different questions than these.
Write a computer code or Excel formula and ask ChatGPT to explain how it works	Explain how the 'for' loop works in Python, and provide an example code
Use ChatGPT to plan projects and essays	What main topics need to be covered on this topic: African indigenous plants? Evaluate the output against the assignment requirements and the module content to make sure you address the main points.

### ***Uses of ChatGPT for students to enhance students' productivity:***

<b>Task</b>	<b>Examples of ChatGPT prompt (input)</b>
Proofread written work and check for grammar, punctuation, and spelling errors	Proofread the following text: ...
Create an Excel formula to automate calculations	Create an Excel formula to calculate the average of a range of cells.
Create PowerPoint slides for presentations	Create ten slide PowerPoint presentation on the topic of renewable energy or use your own text. Then personalise it to your style.
Generate code for various programming languages and applications	Write a Python program that calculates the Fibonacci sequence
Edit your CV, write a cover letter, and prepare for an interview	Write a CV based on the following information ...; follow-up prompt: Use my CV to write a cover letter based on the following key requirements in the job description – paste job description; follow-up prompt: Give me ten possible interview questions and the appropriate reply to them based on my CV and the job description.

**Uses of ChatGPT for students for personalised 24/7 free Tutor support:**

Task	Examples of ChatGPT prompt (input)
Explain and teach a topic like a tutor	Teach me how to solve cubic equations and include a quiz at the end. Allow me to answer, and if it is wrong, explain the steps.
Summarise long or complex readings to make it easier to understand and retain critical concepts	Write a half-page summary about the main ideas of "...". Evaluate the output against the assignment requirements and the module content to make sure you address the main points.
Assist with homework  E.g., Calculate	Solve the following quadratic equation: $x^2 + 5x + 6 = 0$ and explain the steps.  Follow-up prompt: Give an example of a real-world problem that could be solved using this formula. Then use these steps to solve equations with different values to practice solving these equations yourself.
Generate alternative phrasing or synonyms to improve the quality and clarity of written work	Provide an alternative phrasing for the sentence: 'The research findings were inconclusive'.
Identify prior knowledge required to understand a topic	What prior knowledge do I need to understand the principles of supply and demand in economics?
Translate into home languages	Translate the following passage from English into isiXhosa: 'The internet has revolutionised how people communicate and share information. If you are unsure if the output is correct, check it with another person who knows both languages'.
Provide scaffolding support	Break down the steps involved in solving a quadratic equation and explain each step in simple terms.
Ask ChatGPT for examples	Provide an example of a deductive argument and an inductive argument, and explain the difference between the two.
Provide coding support and explanations for different programming languages	Explain how to use a 'for' loop in Python to iterate over a list of numbers.
Give study tips or ideas to improve marks or time management tips	What are some effective study strategies for preparing for exams?
Create a glossary of terms for a topic in different languages	Create a glossary of terms for an introduction to psychology course in English and isiZulu.

Generate questions and answers for studying or test preparation	Generate ten multiple-choice questions and answers on the topic of organic chemistry.
Get feedback on written work	Review my essay on climate change and provide feedback on its clarity and organisation.

## Summary

ChatGPT is a valuable tool for higher education due to its many strengths. One of its key strengths is its automation and 24/7 availability, which provides instant support for students and educators. It also offers personalised assistance, helping students better understand complex topics. Additionally, ChatGPT's scalability allows it to handle multiple inquiries simultaneously, making it an efficient support system. It is also cost-effective compared to traditional educational support systems. ChatGPT's ability to summarise information in an easy-to-understand way promotes self-directed learning, and its speedy answers save time for both students and educators. Its multilingual capability ensures accessibility for a broader range of users, while its quick accessibility and availability mean that support is always available whenever needed.

While ChatGPT has many strengths, it also has some weaknesses when used in higher education. One of its main limitations is its limited contextual understanding, which can lead to incorrect or irrelevant answers. Its dependence on data quality and quantity can also lead to biases or limitations, and the lack of references makes it difficult to verify the accuracy of the information provided. Therefore, it is essential to carefully evaluate the limitations of ChatGPT and use it in conjunction with other educational resources, and never to replace practising and learning critical human reflection.

