

QIU

QUEST INTERNATIONAL UNIVERSITY

**ARTIFICIAL  
INTELLIGENCE  
IN HIGHER  
EDUCATION  
PLAYBOOK**

Second Edition  
July 2026



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# FOREWORD

## A MESSAGE FROM THE VICE CHANCELLOR QUEST INTERNATIONAL UNIVERSITY

Greetings!

I have the pleasure of writing my thoughts in this updated version of Quest International University's AI in Higher Education Playbook.

It has been almost a year since the playbook was first launched as an open educational resource, with the aim of providing a practical, forward-thinking roadmap for navigating the rapidly evolving landscape of education. We wanted to empower educators, creators, and leaders with the tools to thrive in a world being reshaped by technology.

But if there is one thing the digital age has taught us, it is that change waits for no one. The AI momentum has increased and does not look as though it will waver anytime soon. The university has since progressed in terms of academic staff capacity building in the use of Gen AI tools for teaching and learning as well as sharing of actual practices in the classroom, student training and moving on, awareness sessions for non-academic staff.

To ensure our community remains at the forefront of this technological evolution, this updated edition introduces two crucial new chapters that bridge macro-industry trends with day-to-day academic excellence:

- **Gen AI in Action:** We move from theory to practice. This chapter features concrete, real-world examples of our own teaching staff actively integrating GenAI tools into their pedagogy - demonstrating how to design dynamic lessons, streamline administrative tasks, and foster deeper student engagement.
- **AI Applications Across Disciplines:** We expand our lens beyond campus walls to analyse how AI is fundamentally reshaping diverse professional industries. By understanding how these fields are evolving, we can better align our curricula to graduate future-ready professionals.

As we embrace these new dimensions, we must continue to navigate this future with care. We must ensure that our use of Gen AI remains ethical, transparent, and equitable.

This playbook remains a living document. QIU has always been a place of innovation; let us use it to spark conversations, share best practices, and build a teaching-learning environment where AI serves as a powerful tool to augment human potential. As you explore these new chapters, we invite you to view AI not as a replacement for human ingenuity, but as a catalyst for it.



PROFESSOR ZITA MOHD FAHMI

# INTRODUCTION

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**“The future of AI is not about replacing humans, it’s about augmenting human capabilities.”**

*Sundar Pichai*

AI is rapidly transforming higher education, from what we teach to the way we teach and how we assess student learning. This AI in Higher Education Playbook is a toolkit designed to help academic staff in higher education institutions navigate this change. It provides practical guidance, examples, and resources to help you integrate AI and its sub-set, the Generative AI (Gen AI), effectively and responsibly into your work.

At Quest International University, we believe that by embracing AI and Gen AI with a thoughtful and ethical approach, we can unlock new opportunities for innovation, personalise the student learning experience, and better prepare students for a future where AI is an integral part of their lives and careers.

This Playbook is not just about the "what" and the "how," but also the "why." It's an invitation to engage in a continual effort of improving the outcomes of education, ensuring that Generative AI is used by students and academic staff to foster higher order thinking, creativity, and lifelong learning.

This document is a living document; the university is committed to conducting periodic reviews to this Playbook and to continually update as necessary, to address emerging trends and challenges in a timely manner. This ongoing commitment ensures that QIU remains at the forefront of educational innovation, adapting its policies and practices to leverage Generative AI's benefits while mitigating potential risks, thereby fostering an environment of continuous learning and responsible technological integration among academic staff and students.

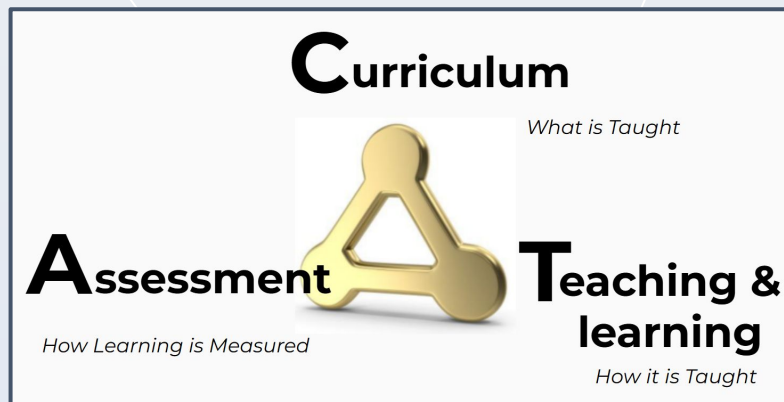
# THE THREE KEY PILLARS *The Iron Triangle*

As educators shaping the next generation, we cannot, and should not, turn away from AI. It is no longer a matter of if we engage with it, but how.

## How do we redesign education in a world where AI is no longer optional, but essential?

Transformation in education won't happen overnight — Rome wasn't built in a day. But every transformation begins with a **first step**.

To integrate Generative AI (Gen AI) meaningfully and strategically, we must revisit and reimagine the three key pillars of education:



## 1. CURRICULUM

To be workforce-ready, students must be empowered to use AI not only as consumers, but also as co-creators of knowledge. Curriculum must be rethought and redesigned to ensure the relevance and future-readiness of our programmes.

### 🔑 Key Questions:

- Are our programmes preparing students for an AI-driven world?
- Do our learning outcomes foster digital and AI literacy, ethical reasoning, adaptability, and creativity?
- Are students empowered to use AI not only as consumers but as co-creators of knowledge?

### 💡 Practical Strategies:

- Embed AI-related competencies across all disciplines, not only in technology courses.
- Introduce AI use-cases, prompt engineering, evaluation of AI outputs, and ethics.
- Align curriculum with AI literacy and responsible innovation.



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## 2. ASSESSMENT

Traditional exams and assignments risk becoming outdated in an age where Gen AI can generate essays, solve equations, and even write code.

### Key Questions:

- Are our assessments measuring thinking or typing?
- Do rubrics reward originality, critical analysis, and AI-augmented insights?
- Should students be allowed—or even required—to use AI?

### Practical Strategies:

- Shift to authentic, process-oriented, and AI-literate assessments.
- Require students to document how they used AI, reflect on its limitations, or critique AI-generated outputs.
- Move towards tasks that highlight creativity, problem-solving, and ethical judgment.

## 3. TEACHING AND LEARNING

Teaching is no longer about delivering content, and learning is no longer about memorising facts. AI enables more personalised, interactive, and inquiry-driven learning.

### Key Questions:

- Are our pedagogies evolving to include co-learning with AI?
- Do we give students agency in how they engage with AI tools?
- Are we modeling responsible, ethical AI usage in the classroom?

### Practical Strategies:

- Use Gen AI to support differentiated learning, simulate real-world scenarios, and enhance feedback.
- Encourage students to co-create content with AI while reflecting critically on the process.
- Promote self-regulated learning and inquiry-based approaches, supported by AI tools.

# AI IN THE CURRICULUM

Artificial Intelligence is influencing every discipline in unique ways—from streamlining processes to creating entirely new opportunities.








## How is AI Changing Your Field?

From healthcare and food technology to finance and business, AI is revolutionising the way we work, solve problems, and deliver value. The following part showcases real-world examples of AI applications, highlighting how AI streamlines processes, enhances decision-making, and creates innovative solutions. However, it is important to note that human judgement is essential when using AI in professional context.

### 1. AI IN FINANCE: EXPENSIFY






[Expensify](#) is an AI-powered expense management tool that helps individuals and organisations manage their finances more efficiently.

-  **Automated receipt capture** – Snap a photo, AI extracts and records details.
-  **Smart categorisation** – Automatically assigns categories based on policies and past behaviour.
-  **Policy checks** – Instantly flags non-compliant expenses.
-  **Anomaly detection** – Identifies unusual or suspicious purchases.
-  **Fraud prevention** – Detects fake receipts in real time.
-  **Report automation** – Prepares and submits expense reports automatically.
-  **Concierge chatbot** – Uses Generative AI to answer questions, suggest actions, and guide users.

### 2. AI IN RADIOLOGY: AIDOC BRAIN ANEURYSM AI SOLUTION

[AIDOC](#) is an AI radiology platform revolutionizes healthcare by empowering radiologists to play a central role, fostering deeper connections throughout the patient's journey and enabling multi-disciplinary teams to deliver more impactful care.













-  Automatically analyse all head CTAs
-  Flag both suspected and unexpected findings
-  Triage suspected brain aneurysms within radiologists' worklists



### 3. AI IN BUSINESS


AI in Business is transforming the way small businesses grow, compete, and connect with their customers.








 This [video](#) highlights how AI is revolutionizing the world of business.

-  **Marketing automation** – Streamlines campaigns and nurtures leads.
-  **Competitor insights** – Tracks and analyses competitors' moves to stay ahead.
-  **Local SEO mastery** – Boosts visibility and attracts nearby customers.
-  **AI-powered chatbots** – Engages customers 24/7 & answering questions
-  **Visitor conversion** – Turns website visitors into loyal, repeat customers.
-  **Content creation with ChatGPT** – Produces blogs, social media posts, and emails.
-  **Personalised email marketing** – Tailors communication to individual customers.
-  **Smarter decisions** – Leverages data-driven insights to optimise operations.
-  **High Level platform** – Provides an all-in-one AI-powered CRM and marketing suite.

### 4. AI IN FOOD TECHNOLOGY

With machine learning and automation, the industry is moving far beyond manual labor, unlocking smarter farming, safer production, and personalised nutrition.

 This [video](#) shows how AI and machine learning are transforming farming and food technology.

-  **Smart agriculture** – Monitor soil, weather, and crops for higher yields.
-  **Precision farming** – Optimises irrigation, fertilization, and pest control
-  **Food processing automation** – Enhances quality control, safety, and efficiency in production lines.
-  **Supply chain optimization** – Predicts demand, reduces waste, and streamlines distribution.
-  **Personalised nutrition** – Creates custom meal plans and products based on individual health data.
-  **Robotics in food service** – Automated cooking, packaging, and customer service.
-  **Market insights** – Analyses consumer trends to guide product development and innovation.

## AI in My Field: Research & Reflect

Conduct a quick exploration of how AI is shaping your field and consider opportunities to integrate AI into the curriculum.

### Guiding Questions

1. How is AI currently being applied in your field?
2. What potential benefits or challenges does AI bring to your discipline?
3. In what ways can AI be meaningfully embedded into teaching and learning?

Next, identify opportunities to embed AI into the curriculum.

To do so, the **[TEMPLATE] AI in Curriculum** ([Appendix 1](#)) can be used, which includes:

- Discipline
- Application of AI (How AI enhances or automates work in the field)
- Specific AI Tool(s)
- Related Course(s)

	<b>Discipline</b>	<b>Application of AI</b> <i>Describe how AI enhances or automates work in the given discipline.</i>	<b>Name of Specific AI Tool</b>	<b>Related Course(s)</b>
E.g. 1	Business Analytics and Technology	Decision Support and Data Insights - Leverages AI to analyze large datasets and recommend data-driven business strategies.	IBM watsonx	Managing Digital Business
E.g. 2	Professional Cooking Skills Training	AI-powered virtual cooking assistants provide step-by-step instructions, suggest adjustments during cooking, and use image recognition to assess technique.	Chef Watson by IBM	International Cuisine
E.g. 3	Artificial Intelligence (AI) & Machine Learning (ML)	Natural language processing for chatbots and translation. Core discipline developing intelligent systems, neural networks, deep learning models, and algorithm optimization for various applications	TensorFlow, PyTorch	Introduction to IT Programming in C++



# GEN AI IN TEACHING AND LEARNING:

“AI is a tool.

The choice about how it gets deployed is ours. ”

Oren Etzioni


## 3.1 Practical Examples


Generative AI tools empower lecturers to transform didactic classrooms into engaging, interactive learning. Refer to [Appendix 2](#) for the templates for the examples shown below.

### A. CONCEPT MAPPING WITH [NAPKIN AI](#)

Converts text to visual so that students can grasp at a glance.

#### **Guide in using Napkin AI for Concept Mapping**

 Scenario: Concept Mapping at the End of a Unit/ Topic

 Goal : Summarise key ideas from the unit through collaborative visualisation.

<b>Step 1</b> Preparation	Ask students to list key points from the lesson/unit in bullet form. Encourage the use of keywords or short phrases.
<b>Step 2</b> Paste into Napkin AI	Direct students to paste their bullet points into Napkin AI. Instruct them to use bulleted formatting for best results.
<b>Step 3</b> Refine the Map Collaboratively	Guide students to work in groups to refine the AI-generated map: <ul style="list-style-type: none"> <li>• Edit node labels to improve clarity.</li> <li>• Add missing concepts or connections.</li> <li>• Group related items using colours or positioning.</li> </ul>
<b>Step 4</b> Facilitate Peer Explanation	Have students explain their maps in pairs or small groups. Encourage them to: <ul style="list-style-type: none"> <li>• Explain different sections of the map.</li> <li>• Ask clarifying questions.</li> <li>• Compare maps to spot gaps or misconceptions.</li> </ul>
<b>Step 5</b> Export or Present	Instruct students to export the final map (image or PDF). Have them present it in class, upload it to the LMS, or submit it for review.

**Note:** For other use cases of concept mapping, refer to [this](#) and adapt the above accordingly.



## B. Reciprocal Teaching with [NotebookLM](#)

AI serves as a thinking *partner*, not a *crutch*. Students engage *first*, then consult AI (NotebookLM) to deepen, question, or test their interpretations.

### Guide to Apply Reciprocal Teaching with NotebookLM


Implementation Details				
Media Example	Video			
Step	Role			
<b>Step 1</b> <b>Assign Reciprocal Teaching Roles</b>	<b>Predictor</b>	<b>Questioner</b>	<b>Clarifier</b>	<b>Summariser</b>
<b>Step 2</b> <b>Independent Work Without AI</b>	Watch the video clip and make your own prediction in writing first	Form 2–3 of your own questions first, based on what you watched/heard	Highlight confusing parts of a visual or transcript and explain in your own words first	Summarise the media content <i>without any AI</i> , then compare it with the AI summary
<b>Step 3</b> <b>AI as a Peer Reviewer</b>	Use AI to suggest possible next scenes/events (based on transcript or visual content)	Use AI to generate deeper inquiry questions about a multimedia source	Use AI to explain a visual, timeline, or data chart in plain language	Use AI to summarise a transcript or podcast in 3 bullet points
<b>Step 4</b> <b>Metacognitive Discussion</b>	Compare: <i>How did your prediction differ from AI's? Whose reasoning was stronger? Why?</i>	Use AI to <i>add or refine</i> , then decide: <i>Which questions best promote discussion?</i>	<i>Did AI help you clarify or oversimplify? What nuance did it miss?</i>	<i>What did AI leave out or misrepresent? How can you improve your own summary?</i>

**Note:** For other forms of media, refer to [this](#) and adapt the above accordingly.



## C. Jigsaw Activity With Perplexity

A collaborative learning strategy where students use Perplexity AI to research different subtopics in groups, then come together to share and piece together their findings for a complete understanding of the main topic.

 <b>Steps to Design Jigsaw Activity with Perplexity</b>	
<p><b>Step 1</b> Clarify Your Purpose</p>	<ul style="list-style-type: none"> <li>• What's your instructional goal? (e.g. content coverage, critical thinking, collaborative skills)</li> <li>• Do you have specific materials?</li> <li>• Do you want the AI to suggest content, refine a design, or both?</li> </ul> <p><b>Prompt AI:</b> "You're an expert in designing active learning for university students. I want to use the jigsaw method to teach [TOPIC] in my [PROGRAMME] [COURSE] class. Generate a step-by-step guide including how to divide the topic, form groups, structure time, and ensure accountability. Ask one question at a time, max 5 questions, to refine the design."</p>
<p><b>Step 2</b> Gather Materials for Input</p>	<p><b>Upload or summarise for the AI:</b></p> <ul style="list-style-type: none"> <li>• Learning outcomes</li> <li>• Syllabus outline or lesson plan</li> <li>• Readings (or ask AI to recommend)</li> <li>• Assessment rubrics (if any)</li> </ul> <p><b>AI Prompt Ideas:</b></p> <ul style="list-style-type: none"> <li>• "Suggest 4 short readings (under 1 hour each) for students to prepare for a jigsaw activity on [TOPIC]."</li> <li>• "Recommend free and accessible online materials for a jigsaw on [TOPIC]."</li> </ul>
<p><b>Step 3</b> Design with AI Assistance</p>	<p><b>Once AI gives a draft activity:</b></p> <ul style="list-style-type: none"> <li>• Check for group size, content division, and accountability strategies</li> <li>• Tweak the prompt if needed:               <ul style="list-style-type: none"> <li>○ "Make groups smaller, 3-4 per group."</li> <li>○ "Include guiding questions for each expert group."</li> <li>○ "Add a short reflection prompt for the end of the activity."</li> <li>○ "Give me 3 sample MCQs for the assessment you suggested."</li> </ul> </li> </ul>

<b>Step 4</b> Facilitate, Reflect, Assess	<b>Component</b>	<b>AI Can Help You...</b>
	Expert Groups	Define subtopics and assign clear roles and outputs
	Sharing Groups	Suggest synthesis tasks that promote discussion and debate
	Time Management	Propose a timing breakdown (e.g. 15–20–15 mins)
	Accountability	Include prompts, peer checks, or short quizzes
<b>Step 5</b> Structure the Jigsaw Components	<b>AI Prompt Ideas:</b> <ul style="list-style-type: none"> <li>• “Suggest a whole-class debrief activity after the jigsaw.”</li> <li>• “Give me a reflective question for students to summarise key insights.”</li> <li>• “Design a 5-minute formative quiz on [TOPIC] after the jigsaw.”</li> </ul>	

### Tips for Success

- **Iterate:** Run your prompt several times for varied ideas
- **Embed Interdependence:** Each group’s input must matter
- **Clarify Roles:** Give guiding questions for every group
- **Assess Thoughtfully:** Use AI to generate self/ peer reflection prompts or short assessments
- **Support Materials:** Use AI to find open-access or scaffolded content tailored to different reading levels


### Example of an AI-Supported Activity

Phase	Description
<b>Pre-class</b>	Perplexity generates 4 short texts on climate policy
<b>Expert Groups</b>	Each group explores 1 text, guided by 3 AI-generated Qs
<b>Sharing Groups</b>	Regrouped members teach their topic to peers
<b>Whole-class Wrap</b>	Use AI-generated discussion prompts for synthesis
<b>Assessment</b>	AI-designed short quiz + reflective prompt



## D. Think-AI-Pair-Share


An enhanced version of the classic Think-Pair-Share strategy, leveraging AI to deepen individual reflection and support inclusive, thoughtful dialogue.

 <b>Steps to Implement Think-AI-Pair-Share</b>	
<b>Step 1</b> Think	Students reflect independently on a guiding question related to the lesson.  <i>Example: "What ethical dilemmas arise in using generative AI in education?"</i>
<b>Step 2</b> AI	Each student engages with an AI tool (e.g., ChatGPT, NotebookLM) to: <ul style="list-style-type: none"><li>• Explore multiple perspectives</li><li>• Clarify understanding</li><li>• Generate supporting points or counterarguments</li><li>• Ask follow-up questions to refine thinking</li></ul> Alternative - School AI has its own <a href="#">Think-AI-Pair-Share</a> Chatbot
<b>Step 3</b> Pair	Students discuss their ideas and AI-augmented insights with a partner. They may compare, contrast, and consolidate their views.
<b>Step 4</b> Share	Pairs (or selected students) share their key takeaways with the whole class. <ul style="list-style-type: none"><li>• <i>Use a collaborative tool (e.g., Padlet, Jamboard, Google Slides) to post collective insights.</i></li></ul>



## E. Role-Play with AI

Helps to deepen students' understanding by **applying, analysing, and evaluating** course content through **AI-assisted role-play**, simulating real-world tasks, dialogues, or professional practices.

 <b>Steps to Design Role-Play with AI</b>		
<b>Step 1</b>	<b>Description</b>	<b>Lecturer's Role</b>
Prepare	Define the learning outcome. Choose a real-life scenario where students need to apply their learning.	Identify student and AI roles relevant to the discipline.
<b>Step 2</b> Prompt	Students initiate interaction using the AI prompt template (see below).	Provide scaffolding and sample prompts. Demonstrate how to role-play responsibly.
<b>Step 3</b> Role-Play	Student engages in back-and-forth dialogue with AI, staying in character.	Observe, support, and ensure students critically reflect on the dialogue.
<b>Step 4</b> Reflect	Students summarise what they learned, how they applied their knowledge, and any misconceptions.	Guide whole-class reflection or ask students to submit a reflection log.

### AI Prompt Idea:

The goal of this interaction is for us to role-play with each other. You will play the role of a [INSERT AI ROLE] engaging in [INSERT AI ACTION]. I will play the role of a [INSERT STUDENT ROLE] engaging in [INSERT STUDENT ACTION].

Suggest [3 DIFFERENT SCENARIO TOPICS] for us to choose from. I will pick one. Only play your role. Do not play my role. Wait for me to respond after your turn.

# GEN AI IN TEACHING AND LEARNING:

## 3.2 Virtual Teaching Assistant

Generative AI can act as a powerful Virtual Teaching Assistant (VTA), supporting lecturers and students across teaching, learning, and assessment.

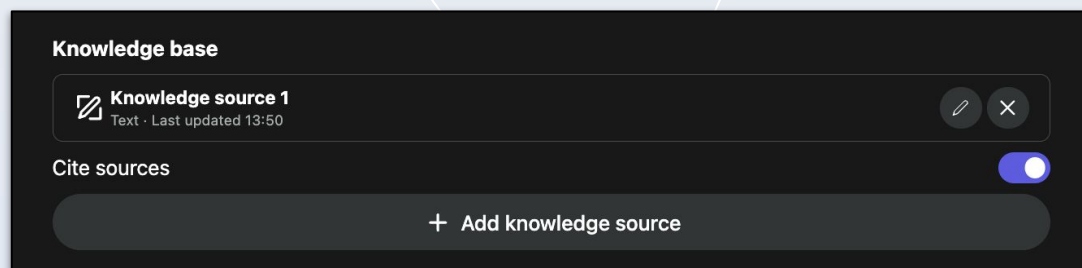
Unlike traditional tools, VTAs are interactive, adaptive, and available on demand - extending the classroom beyond fixed schedules.

They deliver real-time explanations, personalised feedback, and guided practice, while reducing lecturers' administrative tasks and empowering students with self-directed learning.

### A. POE - Prompt Bot

Create a course companion that answers student questions, explains concepts, and points to the right resources 24/7. The bot is trained only on what you feed it (course outline, slides, reading materials).

- It supports formats like .txt, .pdf, .docx, and .html. The total size limit is 5GB or 30 million characters.



### Practical Strategies:

- Use it as a **course FAQ** (deadlines, rubrics, submission rules) and **content explainer** (key concepts, examples).
- Restrict answers to **uploaded materials only**; ask the bot to cite the specific file/section when possible.
- Add a **disclaimer**: e.g. "This bot summarises course materials; for special cases, ask your lecturer."



## How to create a prompt bot:

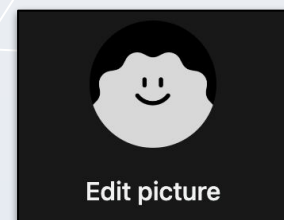
### i. Open the create bot page.

If you are using a web browser, go to [poe.com](https://poe.com) and click on the "Create a bot" button in the left sidebar. Alternatively you can navigate directly to [poe.com/create\\_bot](https://poe.com/create_bot).

If you are using the Poe mobile app, tap the ☰ icon the top-left to open the sidebar and then tap on the "Create a bot" button at the top of the menu.

### ii. Customise how your bot will look

Upload a picture (Optional), this helps give your bot a distinctive appearance.



### iii. Select a bot name

Choose a unique identifier (4–20 characters; letters, numbers, dashes, periods, underscores). Symbols are treated the same (e.g., Bot\_A = BotA = Bot-A). A random name will be prefilled, which you can keep or update anytime.

**Name\***  
Should be unique and use 4-20 characters, including letters, numbers, dashes, periods and underscores.

### iv. Write a bot description (Optional)

A piece of text that describes your bot. This will be shown to people who land on the bot page.

**Bot profile**

**Bio**

Describe what your bot does and what people can expect from it.

0 / 4000



## v. **Define your bot's behavior**

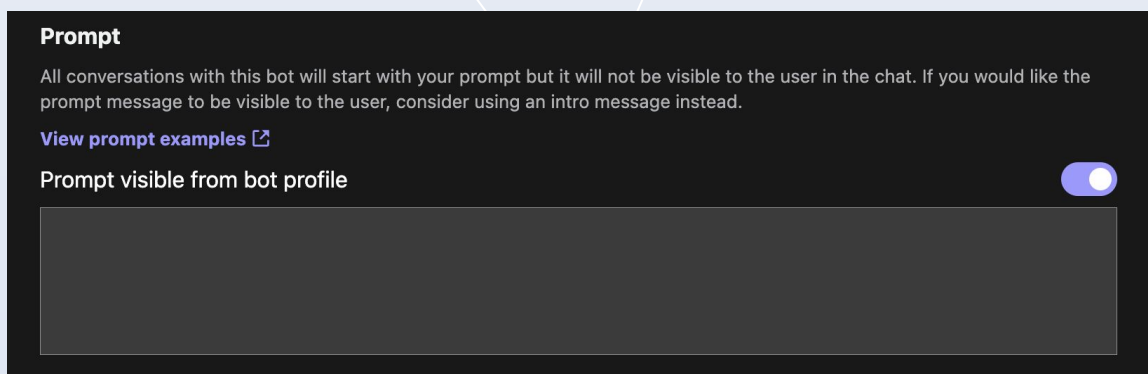
### Select a base bot

This is the underlying bot that your prompt bot is powered by.



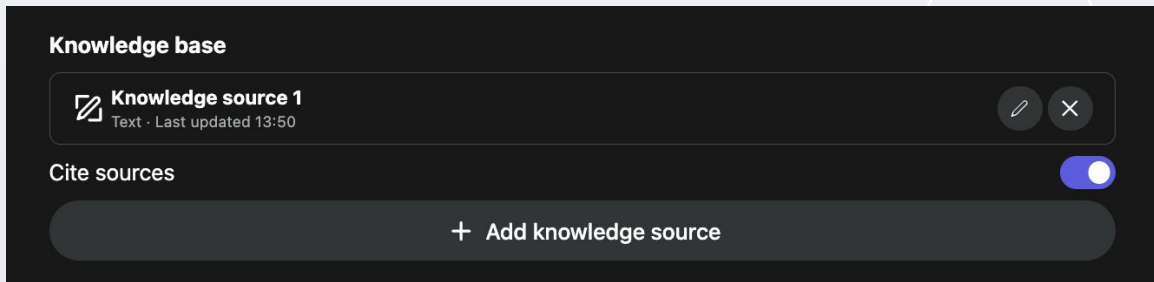
### Provide a prompt

Describe what your bot should do or how it should behave. For more information on how to write a good prompt, check out [prompts best practices](#) guide. You can also use the "Prompt visible from bot profile" option to decide whether your prompt should be visible to the public.



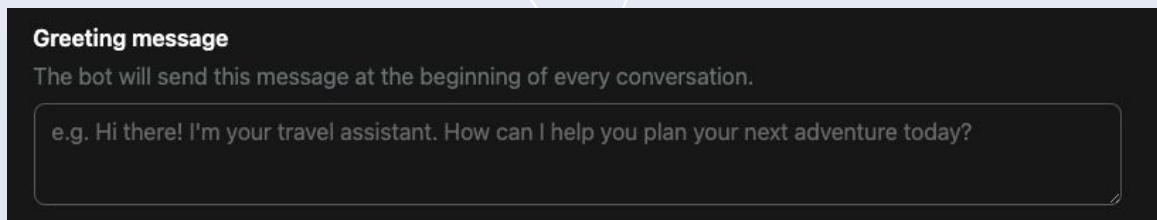
## Provide a knowledge base

Add files (.txt, .pdf, .docx, .html) or text (up to 5GB/30M characters) for your bot to reference when generating responses. You can also enable “Cite sources” to show in-line citations and references.



## Provide a greeting message

Set the opening message shown when users land on the bot page. Use it to explain the bot’s purpose or request initial information.

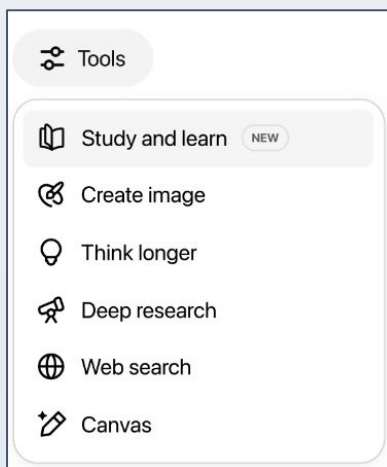


## B. ChatGPT - Study Mode

When students engage with study mode, they are met with guiding questions that calibrate responses to their objective and skill level to help them build deeper understanding. Study mode is designed to be engaging and interactive, and to help students learn something, not just finish something.

### To use Study Mode on ChatGPT:

- Select "Study and learn" from tools in ChatGPT and ask a question.



### Key Features

- **Interactive prompts:** Combines Socratic questioning, hints, and self-reflection prompts to guide understanding and promote active learning, instead of providing answers outright.
- **Scaffolded responses:** Information is organised into easy-to-follow sections that highlight the key connections between topics, keeping information engaging with just the right amount of context and reducing overwhelm for complex topics.
- **Personalised support:** Lessons are tailored to the right level for the user, based on questions that assess skill level and memory from previous chats.
- **Knowledge checks:** Quizzes and open-ended questions, along with personalised feedback to track progress, support knowledge retention and the ability to apply that knowledge in new contexts.
- **Flexibility:** Easily toggle study mode on and off during a conversation, giving you the flexibility to adapt to your learning goals in each conversation.



---

## C. Yoodli - Presentation Practice

Yoodli functions as an AI-powered presentation coach, providing students with a safe, judgment-free space to practise their speaking skills. By simulating real presentation contexts and offering instant, personalised feedback, it helps learners build confidence and improve delivery.

### Key Features

- **Audience Simulation:** Students can select the type of audience (e.g., peers, professionals), tailoring feedback to the intended context.
- **Flexible Practice Flow:** Options to rehearse live or by recording, allowing students to practise at their own pace.
- **Comprehensive Feedback Analytics:** After each session, students receive a detailed speaking report with metrics such as pacing, filler word usage, and clarity, alongside targeted suggestions for improvement.

### How to get started?

- Go to <https://app.yoodli.ai/practice/speech>
- Provide Yoodli access to your microphone and camera
- Press "Start" and, once the countdown finishes, start talking
- Once you've finished with your speech, either press "View Analysis" to save the recording and get feedback, or press "Ask me a follow up-question" to enter Q&A mode



# GEN AI IN TEACHING AND LEARNING:

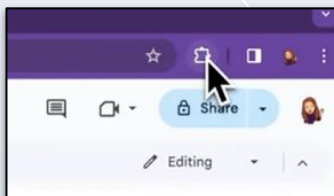
## 3.3 Differentiation in Learning

### A. Create Differentiated Materials with Brisk Teaching

A free AI-powered Chrome extension that functions as an AI co-teacher, helping educators create content and adapt materials for different learning levels.

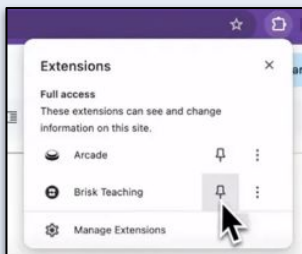
#### To get started:

- Install the Brisk extension in Google Chrome for free. Click [here](#) and then click the "Add" button to install Brisk.
- Pin Brisk to your browser toolbar.



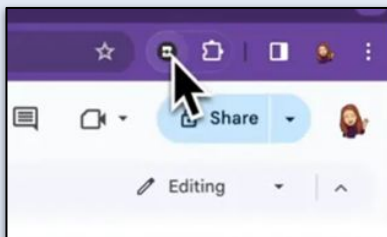
01

First, click on the puzzle piece icon in your Chrome or Edge toolbar.



02

Click on the pin icon next to the Brisk Teaching extension in Chrome, or the eye icon in Edge.



03

You should now see the Brisk icon in your browser toolbar!

#### Pro Tip

Click on the Brisk icon in your toolbar to make it show up on the bottom right corner of your screen when you need it. Click the Brisk icon in your toolbar again when you want Brisk to go away.

## Practical Use Cases:

- ### Leveling Text and Explanations

Use Brisk Teaching to adjust reading materials to a student's level, helping them learn new things without being overwhelmed.

Universal Journal of Educational Research 4(11): 2581-2588, 2016  
DOI: 10.15189/ujer.2016.041111

**Differentiation of Teaching and Learning: The Teachers' Perspective**

Theoula Er...  
Department

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terms of the Creative Commons Attribution License

**Abstract** The aims of this action research investigate the process of differentiation of learning in mixed ability classes from the perspective of teachers, and (b) to examine the effectiveness of differentiation of teaching and learning in mixed ability classes from the first class of the 15 year olds, their self-efficacy and their attitudes toward learning. This action research uses the results of tests, students' interviews before and after the class observations and teachers' diary records.

Abstract

This study looks at how teachers can adapt their teaching methods for different students in the same class. The researchers wanted to know:

1. How teachers handle the challenges of teaching students with different abilities
2. How teachers improve their skills through hands-on research in their classrooms
3. If adapting teaching methods helps improve students' reading skills

The study involved teachers trying new teaching methods, then reflecting on what worked. They also tested students before and after to see if their reading improved. The results showed that teachers faced several challenges at first, but by working together and trying new things, they were able to overcome these challenges. The adapted teaching methods also helped improve students' reading abilities and attitudes toward learning.

1. Introduction

Being able to read well is very important for success in school and life. However, many students struggle with reading, even in high school. This is true in Cyprus, where this study took place, as well as in other countries like the United States.

- ### Translation

With just a few clicks, translate any text into one of 48+ languages to create inclusive content for students.

WEB PAGE

Having trouble using the extension? Email hello@briskteaching.com

**Brisk Educator Free Plan** NEXT

Create Give Feedback

Inspect Writing Change Level

Boost Student Activity

POPULAR TOOLS:

Quiz Presentation Podcast

WEB PAGE

← **Create Library** ×

Create Anything

Curriculum Essentials

Quiz Rubric

Syllabus Progress Report

Resource Exemplar

Lesson Plan DOK Questions

Decodable Text **Translation**

WEB PAGE

← **Brisk** NEXT

Translation Chinese (...) Standard AI

**Prompt**

Any guidance how you'd like it translated?

Prompt history

University

Include sources

**Brisk It**

## 教育中的差异化：一篇配置性

### 作者

Ingunn Eikeland 和 Stein Erik Ohna  
斯塔万格大学教育与体育科学系，挪威斯塔万格

### 摘要

教育中的差异化可以被视为应对学生多样性的一种手段，以实际语境中被广泛讨论，它似乎是一种多样的现象，以各种形式在调查差异化在国际背景下的表现，并为该概念提供急需的概



## 2. Create Multiple Means of Representation

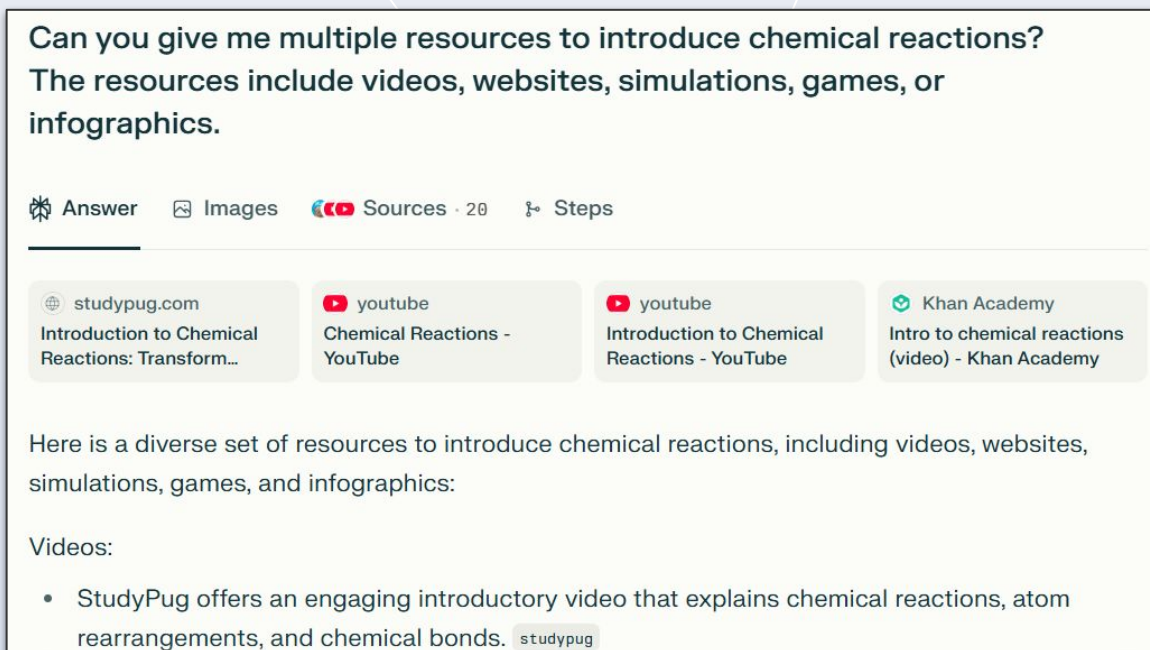
In line with Universal Design for Learning (UDL), lecturers can support diverse learners by presenting content in different formats.

- Example, when covering a topic, you might provide a short video, a visual summary (like an infographic), and written notes.

### Using Perplexity:





- Enter the following prompt:

Can you give me multiple resources to introduce [topic]? The resources include [videos, websites, simulations, games, or infographics]



Can you give me multiple resources to introduce chemical reactions? The resources include videos, websites, simulations, games, or infographics.

Answer Images Sources · 20 Steps

 studypug.com Introduction to Chemical Reactions: Transform...	 youtube Chemical Reactions - YouTube	 youtube Introduction to Chemical Reactions - YouTube	 Khan Academy Intro to chemical reactions (video) - Khan Academy
--	---	---	--

Here is a diverse set of resources to introduce chemical reactions, including videos, websites, simulations, games, and infographics:

Videos:

- StudyPug offers an engaging introductory video that explains chemical reactions, atom rearrangements, and chemical bonds. [studypug](#)




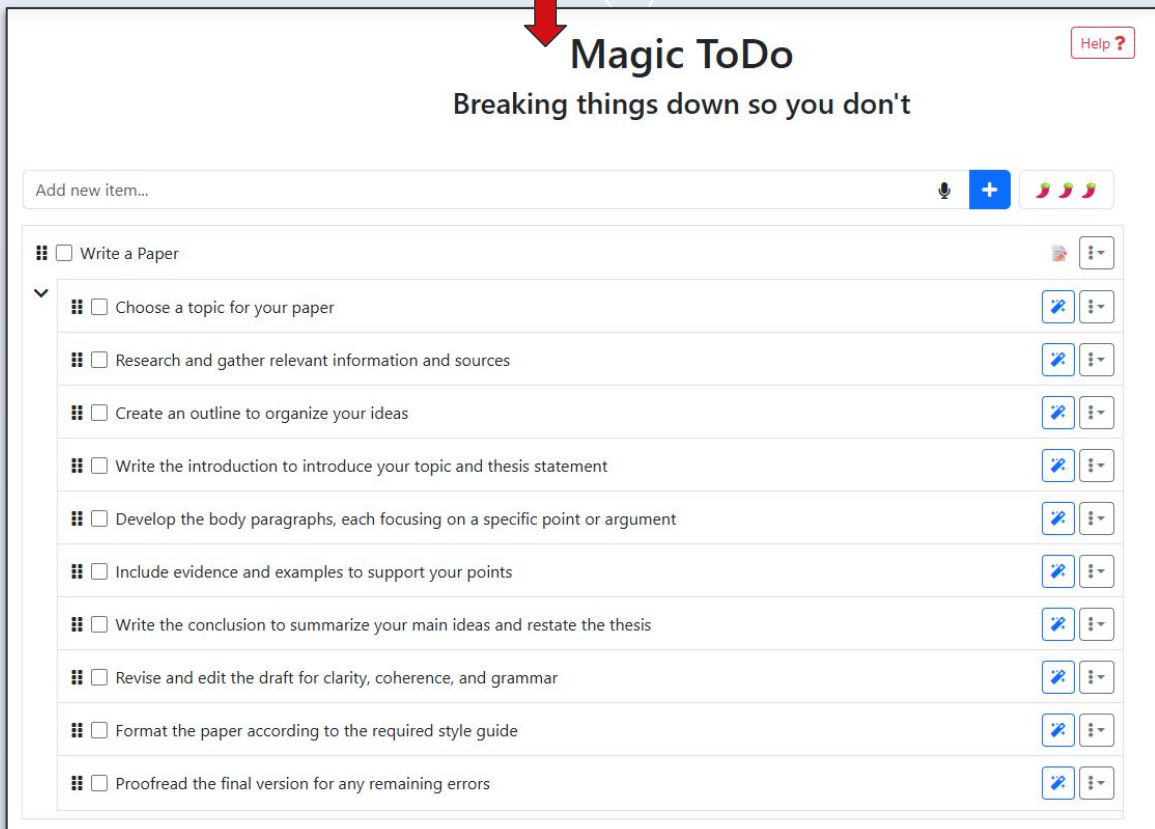
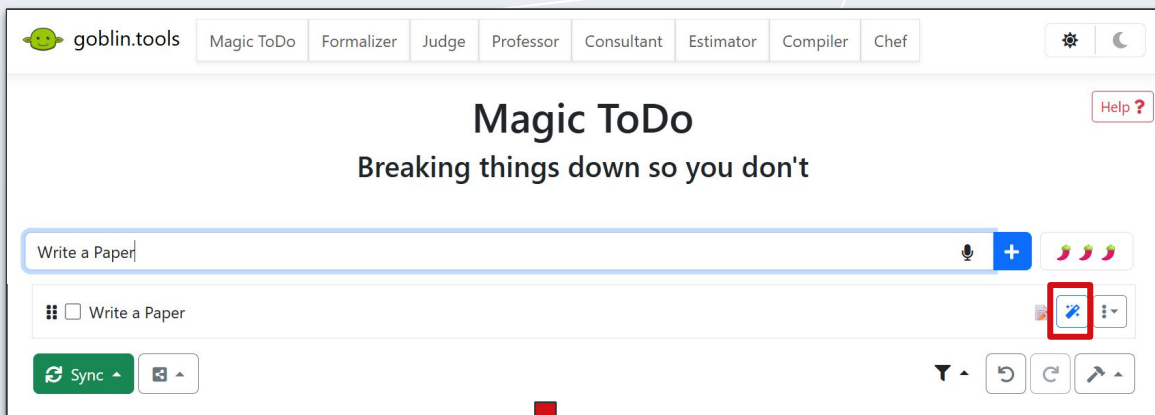
### 3. Break Down Complex Tasks

Complex assignments and projects can often overwhelm students.

[Goblin Tools' Magic ToDo](#) provides an AI-powered way to transform intimidating tasks into manageable, bite-sized steps.

#### To get started:

- Go to [Goblin Tools' Magic ToDo](#) and enter the complex task.
- Click on the  icon for Magic ToDo to generate a structured list of smaller, actionable steps.



# GEN AI IN TEACHING AND LEARNING:

“The real problem is not whether machines think, but whether men do.”

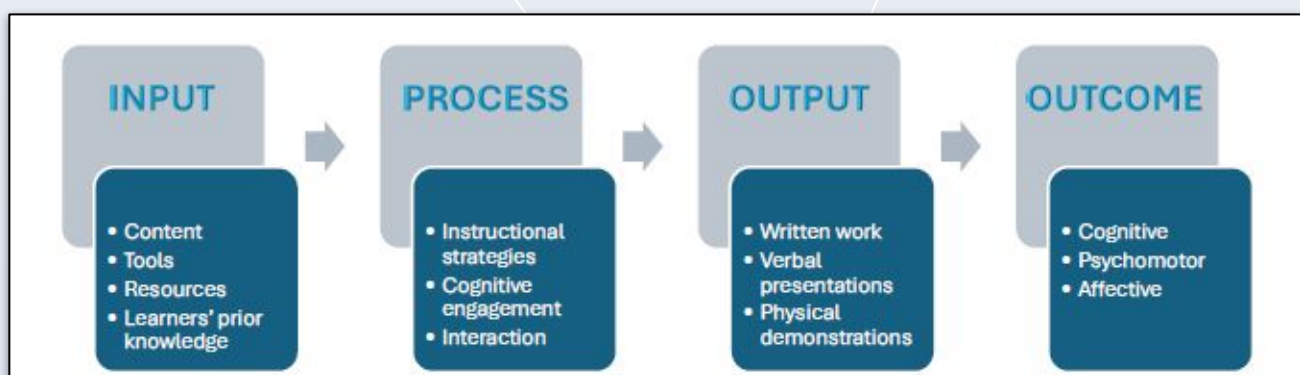
*B.F. Skinner*

## 3.4 Enhancing Higher Order Thinking

### 1. THE IPOO MODEL

The Input-Process-Output (IPO) model is a framework used to describe how a system transforms inputs into outputs. The model may be extended to include outcomes.

In education, the IPOO model can be applied to understand how learner outcomes are affected by what goes into the planning and implementation of the teaching-learning activities.



#### (a) INPUT

The input in a teaching and learning context refers to all the resources and conditions provided to the learner. These include:

- **Content**  
The information, concepts, and skills to be learned (e.g., reference books, lecture notes, videos).
- **Instructional materials**  
Tools and resources that deliver the content (e.g., worksheets, software, laboratory equipment).
- **Learner's prior knowledge**  
The existing knowledge and experiences a learner brings to the learning process.



---

## (b) PROCESS

The process is the core of the model, representing the cognitive and instructional activities that take place to transform the input. This is where learning happens and involves:

- **Instructional strategies**  
The methods used by the course lecturer to facilitate learning (e.g., lectures, group discussions, problem-solving exercises).
- **Cognitive engagement**  
The mental activities the learner performs to internalise the information (e.g., recalling, synthesizing, analyzing, evaluating, creating).
- **Interaction**  
The communication between learners and course lecturers, or among learners themselves, that helps clarify concepts and build understanding.

## (c) OUTPUT

The output is the result of the learning process. It represents the measurable and tangible results or products that the learner demonstrates or submits.

Examples of possible outputs include:

- **Written/ printed work**  
Essays, critiques, literature reviews, laboratory reports, articles, lesson plans
- **Verbal presentations**  
Oral presentations, debates, roleplays
- **Physical demonstrations**  
Artistic performances, conducting laboratory experiments, musical renditions.

## (d) OUTCOME

Learning outcomes may be categorised according to:

- The **cognitive** domain - Knowledge acquired
- The **psychomotor** domain - Skills developed
- The **affective** domain - Values and attitudes internalised

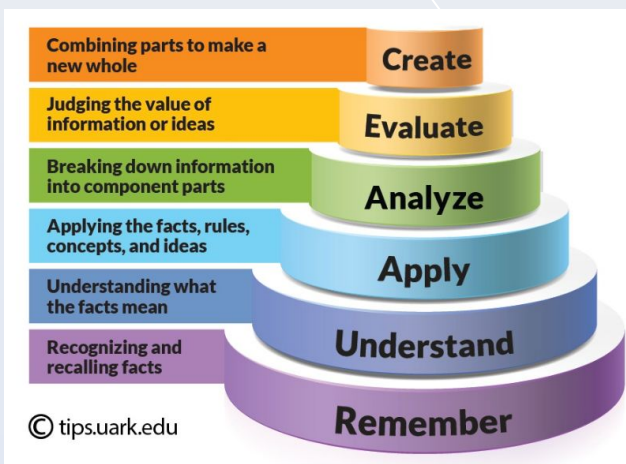


## 2. THE IPOO MODEL and GEN AI USE FOR HIGHER ORDER THINKING

The following are some possibilities in utilising Gen AI to vary the teaching-learning input, process and output in the classroom for the intended learning outcomes:

- Course lecturers providing Gen AI outputs as inputs for the lesson
- Learners using Gen AI as tools to obtain drafts of products or to create visual presentations
- Course lecturers getting learners to figure out how to improve a Gen AI output
- Course lecturers facilitating discussions on the limitations of Gen AI tools.

## 3. BLOOM'S TAXONOMY FOR THE COGNITIVE DOMAIN



Credit: Jessica Shabatura

Source: <https://tips.uark.edu/using-blooms-taxonomy/>

Knowing that learners may use Gen AI tools to produce an output based on the requirements of a learning or assessment task, the onus is then on the course lecturers to ensure that during the teaching-learning process, the learners are provided with opportunities to enhance their higher order thinking skills, i.e. to analyse, evaluate and create.

## 4. METACOGNITIVE SCAFFOLDING

Metacognitive scaffolding in the context of Gen AI refers to providing structured temporary support to learners as they interact with and utilise Gen AI tools. It essentially helps learners develop their awareness and control of their own thinking processes during learning.

This approach aims to enhance learning by guiding students through complex tasks, nurturing higher order thinking, and preventing over-reliance on Gen AI for answers. Such an approach encourages learners to think critically and delve deeper when utilising Gen AI tools, rather than using the tools as a one-stop and one-click solution for all learning tasks. This assists learners in building self-regulation and developing a strong sense of agency in their learning. With such a proactive approach, course lecturers can ensure genuine learning occurs, not fake learning or non-learning.



## 5. THE PLAY CARDS and ACCOMPANYING RUBRICS

Teaching-learning activities using Gen AI can and should be structured to provide metacognitive scaffolding to the learners.

The play cards introduced in this Playbook are intended to help course lecturers develop their teaching-learning activities where basic concepts have been taught and the course learning outcomes are of the higher order in the cognitive domain.



Based on the premise that Gen AI can be used as a tool to help students develop their higher order thinking skills given the appropriate scaffolding in the teaching-learning process, a strategy used in one of the play cards requires learners to first prompt a Gen AI tool to create a draft of an output, followed by critiquing the output and then improving on the draft, giving justifications for the changes based on what they have learnt before.

The strategies introduced in the play cards also help course lecturers to educate learners about the inherent limitations and pitfalls of using Gen AI tools. For example, providing students with a Gen AI output to a learning task that contain some factual inaccuracies and requiring learners to cross check with identified authoritative sources like reference materials, followed by learners recommending points to amend and to expand on.

Another example is asking learners to generate an output using an AI tool based on limited criteria or factors, followed by getting learners to identify other criteria/ factors that are crucial in obtaining a more accurate or precise output.

A total of three play cards, one for each the three higher order thinking skills are available in [Appendix 3](#). Examples for the different fields are available in [Appendix 4](#).

Meanwhile, the rubrics in [Appendix 5](#) are NOT meant to assess learners' outputs but are actually for the course lecturers to check whether their proposed activities meet the desired level.



## GEN AI IN ACTION



Ms Nabillah Rafidah  
Abdul Kadir



Faculty of Social Sciences

Ms Nabillah Rafidah demonstrated **Classpoint** features designed to engage students, such as Word Clouds, Short Answer prompts, and Agree or Disagree polls.

Classpoint is noted for providing immediate feedback, being user-friendly, and keeping the learning environment engaging.

While the number of students per session is limited for the free version, the tool is highly effective in boosting engagement through playful, competitive elements.



Dr Teh Chui Yao

Faculty of Integrated Life Sciences



Dr Teh Chui Yao used **ChatGPT** to design an activity where students first identify minor errors in AI-generated worksheets using their own knowledge.

After completing the task, they checked their answers with AI, allowing them to reflect and learn from both their own reasoning and AI insights.

To reduce over-reliance on AI, Dr Teh incorporated phone-free periods, ensuring students think independently before consulting technology.

This approach balances AI use with critical thinking, making the activity both engaging and educational.

**More on the  
next page!**





Ms Pavinder Kaur  
Gern Baldev Singh

Faculty of Social Sciences

**Diffit**  
For Teachers

Ms Pavinder Kaur introduced **DIFFIT**, an AI tool that transforms existing articles into levelled texts based on students' proficiency levels. In addition to generating vocabulary lists, the tool can also produce comprehension questions, summaries, and differentiated learning tasks.

This tool is flexible enough for multiple disciplines beyond TESL, helping educators manage academically diverse classrooms efficiently.

Diffit is useful for lecturers in creating materials for beginner, intermediate, and advanced learners.



Dr Maisara Shahrom

Faculty of Integrated Life Sciences



Dr Maisara Shahrom shared an upcoming in-class activity which implements a reflective three-step GenAI-integrated workflow for the Electrochemistry topic.

Students will first use **ChatGPT** and **Gemini** during the preparation stage to support pre-class conceptual understanding. Then, they will validate AI-generated predictions by comparing them with actual laboratory observations. Finally, they will audit the AI logic by manually solving complex calculations to identify errors, missing steps, or flawed reasoning.

This approach will encourage students to engage critically with GenAI outputs rather than accept them at face value.



*Ms Hemalatha  
Murugaiah*

Faculty of Integrated Life Sciences



Ms Hemalatha Murugaiah utilised **ChatGPT/ Gemini** to assist students in investigating Good Manufacturing Practice (GMP) violations in the biomanufacturing industry.

Students fed case scenarios into AI to identify contamination sources and proposed corrective actions.

A key component of this activity is cross-checking GenAI output against actual regulatory guidelines to identify gaps or inaccuracies.

Students were required to cross-check GenAI outputs against actual regulations to learn how to distinguish general logic from context-specific legal requirements to produce a GMP compliance summary.



*Dr Ruuhina  
Mohd Sani*

Faculty of Social Sciences



Dr Ruuhina Mohd Sani shared her approach to thesis supervision using **Elicit** and **Jenni AI**.

She demonstrated how Elicit functions as a research assistant for literature searches by automatically identifying relevant academic papers based on research questions rather than keywords, while also retrieving DOI numbers and key bibliographic details for accurate referencing.

This approach saves time and is suitable for both lecturers and students.

Dr Ruuhina also highlighted the use of Jenni AI to support ESL students with language polishing, helping to improve clarity and academic tone without replacing the researcher's original voice.



*Prof Dr Ranjith  
Mehenderkar*

Faculty of Medicine

Prof Dr Ranjith Mehenderkar demonstrated how **Google Vids** can be used to reimagine traditional lectures as concise, 10-minute multimedia presentations.

By uploading these videos to eQIU for pre-class viewing, he found that an asynchronous approach allowed students to learn at their own pace, thereby reducing cognitive overload.

Students gave positive feedback, noting that the short videos were easy to understand and made pre-lecture learning more engaging.



*A. P. Dr Kamariah  
Hasan*

Faculty of Integrated Life Sciences

A. P. Dr Kamariah Hasan used **ChatGPT** to support student learning in a course that integrates advanced biotechnology with ethical reasoning.

Students applied AI for research and idea generation while engaging in hands-on activities such as gene cloning, vector design, and proposing CRISPR-Cas9 strategies, alongside simulation debates on topics like Golden Rice and CRISPR Babies.

Clear academic integrity guidelines, including limits on GenAI-written content, ensured that assessments remained grounded in students' original thinking.



**More on the  
next page!**





Dr Nur Anis  
Raihana Mhd Rodzi

Faculty of Integrated Life Sciences



Dr Nur Anis Raihana incorporated **Perplexity** and **ChatGPT** to simulate a client consultancy experience focused on developing a new chocolate flavour.

Students were assessed on their ability to manage the AI-based “client” interaction and critically analyse the AI’s performance, particularly its depth of questioning and ability to generate meaningful consumer insights.

The initiative showcased how AI can enrich learning in consultancy-based courses, providing students with a dynamic environment to apply theory to practice. Reflections indicated that although many found the abstract, role-play format more challenging than traditional written assessments, they valued its authenticity and relevance to real-world consultancy contexts.



Dr Aervina  
Mison

Faculty of Business & Management



Dr Aervina Mison shared how tools such as **ChatGPT**, **Kahoot**, **NotebookLM**, **Napkin AI** and other generative AI platforms are integrated into her classroom activities, including discussions, debates, and role plays, to enhance engagement and participation.

She emphasised that AI should support students in thinking better, not less.

At the same time, Dr Aervina’s session cautioned against blind reliance on AI and simple copy-and-paste practices, highlighting the importance of reasoning, justification, and meaningful learning.



Dr Mohd Salleh  
Abdul Rahim

Faculty of Computing & Engineering

Dr Mohd Salleh Abdul Rahim demonstrated a specialised workflow for preparing lecture slides:

First, **Perplexity** was used to verify the accuracy of technical and engineering terms.

Next, **Copilot** was employed to enrich the slide content and cross-check information.

Finally, **Gamma** was used to automate the aesthetic design, making slides visually appealing.



Microsoft Copilot



Mr Thinagarajan  
Kunalan

Faculty of Integrated Life Sciences

Mr Thinagarajan Kunalan shared an in-class activity where the students used AI as a "co-pilot" to pitch a sustainable business idea for ESG (Environmental, Social, and Governance) theories.

**ChatGPT** was used for brainstorming and ESG mapping, while **Canva** was used to transform those ideas into visual infographics and professional narratives.

To maintain academic integrity, students must follow strict guardrails by reviewing, paraphrasing, and contextualising all AI-generated content to ensure they remain responsible for the accuracy and ethical reasoning of their final pitch.



# GEN AI IN ASSESSMENT

## What is Gen AI in Assessment?

It intentionally includes the use of Gen AI tools as part of the task. The goal is not to ban AI but to **guide** students in using it meaningfully, ethically, and critically, mirroring how AI is used in real-world settings.



## Why Use Gen AI in Assessment?

### Supports Immediate Feedback

Provide instant feedback to guide students' learning in real time ([Chan, 2023](#); [Perkins et al., 2024](#)).

### Enhances Application-Based Assessment

Shift focus from rote memorization to evaluating learners' ability to apply knowledge in novel and complex situations ([Perkins et al., 2024](#)).

### Promotes Higher-Order Thinking

Allows the design of assessment tasks that foster and evaluate critical thinking, creativity, and complex problem-solving ([Giannakos et al., 2024](#); [Nguyen et al., 2025](#)).

### Enables Authentic, Real-World Assessment

Simulate real-world scenarios and require interdisciplinary skill application ([Ajjawi et al., 2024](#)).

### Aligns with Future-Ready Learning

Prepares students for future workplaces by embedding AI competencies within assessment practices. ([Nguyen et al., 2025](#)).



## Does My Assessment Need to Change? (in the age of AI)

### If Gen AI can do the assignment, did the student really learn?

As Gen AI tools become more accessible, students can produce work with minimal effort, challenging how we assess genuine learning.

Should we ban AI or embrace it to reflect real-world practice?

**Let's re-think assessment in the age of AI.**

### Test Your Assessment With Gen AI

Using Gen AI:

1. Prompt the Gen AI to "do" the assessment.
2. Mark the Gen AI output using your rubric.
3. Refine your prompt to try to improve the output.

#### If the Gen AI performed well

That means students could potentially use AI to complete it easily, with little learning.

So, you should consider:

- (a) Revising your assessment to allow the ethical use of AI; or
- (b) Redesigning it to discourage or prevent AI use

#### **Pause on this:**

*If AI can do this, should students be expected to do more to pass?*

#### If the Gen AI did NOT perform well

That doesn't mean your assessment is "AI-proof."

Students might still try to use Gen AI and get poor results.

If you're not clear about AI use, students might unknowingly rely on poor AI outputs and perform worse.

So, consider:

- (a) Making your AI policy explicit (allowed or not).
- (b) Designing assessment tasks to guide students to use AI effectively.
- (c) Ensuring tasks clearly require skills beyond what AI can do.





## So, should you design assessments that Gen AI can't perform well?

Not always. It depends on your learning outcomes:

If the goal is to...	Then...
Test independent thinking, problem-solving, or authentic performance	✔ Design tasks AI can not do well (e.g., real-time, personal reflection, practical tasks).
Teach students to use AI responsibly in real-world contexts	✔ Allow Gen AI and assess how well they <i>use, critique, or improve</i> AI-generated work.
Assess knowledge recall or foundational skills	✔ Restrict Gen AI use but use secure test-based formats.

### Key Question

Given student access to Gen AI, does my assessment still provide **valid evidence** of learning?



### A guiding reminder:



“Design assessments that demand thinking, not just typing.”



# How do I Integrate Gen AI in Assessment?



## THREE TIER APPROACH

### RED

#### AI-Prohibited

Assessments are designed to evaluate students' independent thinking, recall, language proficiency, or practical skills without external assistance.

**Purpose:** To ensure authenticity, fairness, and accurate measurement of individual competency.

#### Examples

- In-person exams
- Class tests and quizzes
- Oral exams (vivas)
- Language or communication-focused assessments
- Some laboratory and practical sessions

### YELLOW

#### AI-Supported

Assessments are designed to allow some support from Gen AI, such as for brainstorming while still expecting original analysis, argumentation, or reflection.

Students must declare any AI use.

**Purpose:** To support learning while maintaining academic integrity and developing critical thinking and writing skills.

#### Examples

- Essays or written assignments
- Group projects
- Critical reflections
- Initial idea generation

### GREEN

#### AI-Integrated

Assessments are designed to intentionally integrate Gen AI tools as part of the task. Students are expected to use AI ethically and critically, demonstrating an understanding of how to evaluate and refine AI-generated content.

**Purpose:** To prepare students for real-world applications where AI is part of professional practice.

#### Examples

- Tasks that involve prompting, evaluating, or refining AI-generated content
- Projects in AI ethics, design, or application
- Real-world simulations (e.g., marketing campaign using AI tools)









## AI Assessment Scale (AIAS)



Source: <https://aiassessmentscale.com/>

The AIAS was developed by Mike Perkins, Leon Furze, Jasper Roe, and Jason MacVaugh. First introduced in 2023 and updated in Version 2 (2024). It provides a nuanced framework for integrating AI into educational assessments.

## Design Principles for Gen AI in Assessments

 <b>Align with Course Learning Outcomes (CLOs)</b>	Ensure AI use supports the CLOs.
 <b>Define the Role of AI</b>	Be explicit: Is AI used for generation, critique, analysis, or enhancement?
 <b>Communicate Clearly</b>	Give students clear instructions on how, when, and to what extent Gen AI can be used.
 <b>Promote Critical Use</b>	Assess students' ability to evaluate, refine, or justify AI-generated content.
 <b>Use Rubrics</b>	Include criteria that evaluate both the process and output involving Gen AI.
 <b>Require Transparency</b>	Ask students to declare their AI use and reflect on how it contributed to their work.

## Practical Guide: Designing Gen AI-Integrated Assessments

	<b>Aspect</b>	<b>Descriptions</b>
<b>1.</b>	<b>Outcomes and Purpose of the Assessment</b>	<p>Align the assessment clearly with the intended Course Learning Outcome(s).</p> <p>Integrate Gen AI tool(s) meaningfully to support students in achieving the targeted outcome(s).</p> <p>Provide transparent information on how Gen AI tool(s) function within the assessment, including their role in supporting learning and influencing decision-making.</p>
<b>2.</b>	<b>Cognitive Engagement</b>	<p>Promote higher-order thinking skills such as analysis, evaluation, and creation through Gen AI-integrated tasks.</p> <p>Encourage critical engagement with content and meaningful interaction with Gen AI tool(s).</p>
<b>3.</b>	<b>Feedback and Support Mechanisms</b>	<p>Integrate Gen AI tools that provide personalised, real-time feedback (e.g., intelligent writing assistants, adaptive platforms).</p> <p>Embed feedback loops within the assessment process to guide students' progress and support iterative learning.</p>
<b>4.</b>	<b>Ethical Consideration</b>	<p>Provide clear guidelines on the ethical use of Gen AI in assessments.</p> <p>Include expectations for:</p> <ul style="list-style-type: none"><li>• Acknowledging Gen AI support in student submissions</li><li>• Avoiding plagiarism and over-reliance on AI tools</li><li>• Citing AI-generated content where appropriate</li></ul>
<b>5.</b>	<b>Reflection and Metacognition</b>	<p>Use reflection to promote self-awareness, responsible use of AI, and deeper learning. Include opportunities for students to reflect on their use of Gen AI.</p>



## Outline of a Gen AI Integrated Assessment Task

Just as building a house requires a clear blueprint, designing a Gen AI Integrated Assessment begins with a well-thought-out outline. Careful planning ensures your assessment aligns with key principles and intended learning outcomes. To avoid the possibility of non-learning or fake learning, mitigation measures such as incorporating oral presentation and/ or viva voce as part of the assessment plan may be included.

Let us check out the steps below:



Read the ***Practical Guide: Designing Gen AI-Integrated Assessments*** ([Appendix 6A](#))

Explore the key aspects for integrating Gen AI meaningfully into assessment.



Refer to the ***[Samples] Outline for Gen AI-Integrated Assessment Task*** ([Appendix 6B](#))

Here you will see real examples of assessment outlines, giving you a sense of what a well-structured plan looks like.



Build your own using the ***[Template] Outline for Gen AI-Integrated Assessment Task*** ([Appendix 6C](#))

This will help you sketch out your ideas step by step.



Check your outline with the ***[Rubric] Outline for Gen AI-Integrated Assessment Task*** ([Appendix 6D](#))

Just like an inspection ensures a house is safe and sturdy, the rubric will ensure your design is clear, aligned, and meaningfully integrates Gen AI.



# USING GEN AI RESPONSIBLY AND MINDFULLY

**“Artificial intelligence is neither good nor bad. It is a neutral reflection of those who imprint them.”**  
*Emmanuel Apetsi*

## 1. Ethical Considerations for Using Generative AI

### Creatorship

University journey is about building knowledge, skills, and independent thinking. When students rely on Generative AI to create or rewrite assignments without meaningful input, they are:

- Submitting work that is not truly theirs
- Skipping the learning process

### Academic Integrity

When students use AI to do their work and submit it as their own, it is considered academic misconduct - just like getting another person to do their assignment.

## 2. Generative AI: Challenges and Impacts

### Accuracy

Most AI tools do not reveal what data they were trained on.

AI cannot:

- Show where its information comes from
- Provide reliable sources or citations

This means AI content is not a credible source for academic work.

Beware of "AI hallucinations":

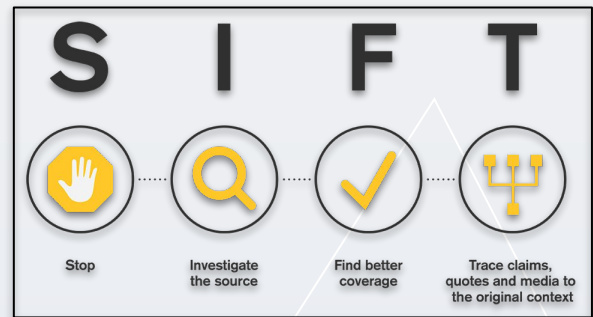
- AI may generate false or outdated information that *looks* correct.
- Some tools (like ChatGPT) may make up citations or refer to non-existent sources.



### 3. How to Review AI-Generated Content

#### Check & Compare AI Content

- Use the [SIFT Method](#):
  - **F**: Find better coverage. Look for reliable sources that support or challenge the AI's claims.
  - **T**: Trace claims to the original source.
- If the AI is grounded, it may include links. Use them to check for accuracy.



Source: "[SIFT \(The Four Moves\)](#)" by [Mike Caulfield](#), licensed under [CC BY 4.0](#)

#### Check Citations for AI Hallucinations

AI tools can generate fake but convincing citations, even using real researchers' names. These false references are known as AI hallucinations.

How to confirm a citation is real?

- Search and check the title of the publication in Google Scholar.
- If the item cannot be found, ask the AI for the unique identifier for the publication: "Can you provide the DOI, ISBN, or ISSN?"
- If the source exists, check the information provided by the AI is summarised correctly.

#### Check Currency

Generative AI tools may not have current information, especially on:

- Recent world events
- New research developments

For example, as of July 2025, when prompted on how recent its training data is:

- Default ChatGPT model (without browsing or the AI-enabled search tool)
  - April 2023
- GPT-4o - October 2023



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## Bias

Generative AI can produce biased content:

- *Human bias*  
Developers may unintentionally embed their own biases when designing AI tools.
- *Biased training data*  
The data used to train AI may reflect existing stereotypes or inequalities.
- *AI interpretation bias*  
AI can develop new biases based on how it processes the data it was trained on.

Always question the output. AI does not guarantee fairness or neutrality.

## Copyright

Generative AI tools are often trained on massive datasets - sometimes including copyright-protected materials.

Key questions to consider:

- Was the data gathered with permission?
- Does it require a licence from the copyright owner?

Using large parts of copyrighted works as inputs or outputs may infringe copyright. Not everything generated by AI is automatically safe to use.

## Privacy

Like many digital tools, Generative AI collects data about its users.

When anyone signs up or use AI tools:

- Their usage data may be tracked to improve or personalise the tool.
- Their data could be shared, sold, or used for marketing or even surveillance.

As such, academic staff and students should avoid entering personal, confidential, or sensitive information in any Gen AI tool.



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## 4. How to Cite AI

The [APA Style Blog](#) provides examples and guidance on how to cite generative AI tools. APA recommends listing the creator or organisation behind the AI model (e.g., OpenAI) as the author.

### **In-Text Citation**

#### Template

(Author/ Creator of AI model, Year of version used)

#### Example

(OpenAI, 2024)

### **References**

#### Template

Author/ Creator of AI model. (Year of model). Name of model (Version of model) [Type or description of model]. Retrieved month day, year, from <https://xxxxx>.

#### Example

OpenAI. (2024). ChatGPT 3.5 [Large language model]. Retrieved February 26, 2024, from <https://chat.openai.com>.

## 5. Check for Plagiarism

All written assignments should be submitted through plagiarism detection software (e.g., Turnitin) to ensure academic integrity.

A common benchmark for acceptable Similarity Scores (excluding quotes, references, and bibliographies) is:

- 25% for Theses and Final Year Projects (Sciences)
- 30% for Theses and Final Year Projects (Social Sciences, Business, Management)
- 30% for ALL other written coursework and assignments

The recommended acceptable score of the AI Writing Indicator NOT exceeding 20% (excluding quotes and bibliography/ reference list).

Both academic staff and students should always refer to their university's Academic Integrity Policy for the specific requirements related to plagiarism and AI use.



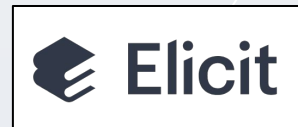
# AI APPLICATIONS ACROSS DISCIPLINES

AI tools can enhance human work by automating routine tasks, supporting data analysis, improving decision-making, and enabling new forms of creativity and problem-solving. The following examples were provided by the relevant faculties in QIU.

## 1. Academic Research

**(a) Literature Review**

Use AI to search, summarise, extract data from, and chat with over 125 million papers.



**(b) Research Writing**

The AI-powered workspace to help with reading, writing, and organising research with ease.



## 2. Accountancy

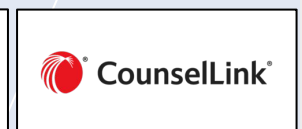
**(a) Auditing and Assurance**

Automate risk assessment by analyzing large datasets for anomalies, generate working papers, and create audit checklists.



**(b) Business and Corporate Law**

Summarise legal cases, draft contracts, and check compliance with regulatory frameworks.



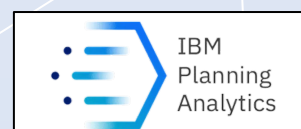
**(c) Corporate Governance and Ethics**

Monitor compliance with governance policies, flag ethical risks, and analyse board meeting transcripts for decision-making trends.



**(d) Financial Management**

Automate financial forecasting, investment analysis, and cash flow optimisation.



**(e) Management Accounting**

Provide real-time cost analysis, budget variance analysis, and scenario planning for decision-making.



**(f) Taxation**

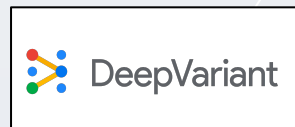
Automate tax calculations, compliance checks, and preparation of tax returns



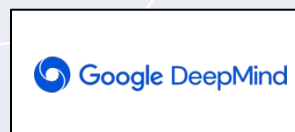
### 3. Biotechnology

**(a) Bioinformatics and Computational Biology**

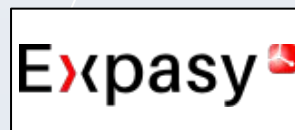
(i) Analyse complex Biological data, identify patterns, and prediction about gene expression.



(ii) Assemble fragmented DNA sequence.



(iii) For genomics, proteomics, transcriptomics and Bioinformatics analysis.



### 4. Business and Administration

**(a) Business Analytics and Technology**

**(i) Predictive Analytics/ Automated Machine Learning**

Uses historical data and algorithms to forecast outcomes such as sales, demand, or customer churn.



**(ii) Decision Support and Data Insights**

Leverages AI to analyse large datasets and recommend data-driven business strategies.



**(iii) Business Analysis**

Embeds AI into spreadsheets to automate calculations, detect trends, and generate insights without coding.



**(b) Economics and Business Environment**

**(i) Economic Forecasting/ Nowcasting**

Applies AI models to predict economic indicators in real time using multiple data sources.



**(ii) Resource-allocation Optimization**

Optimizes distribution of resources such as labor, capital, or raw materials for maximum efficiency.



**(c) Entrepreneurship and Innovation**

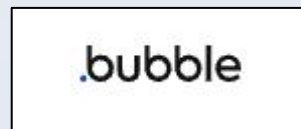
**(i) Business Plan Generation & Disciplined Entrepreneurship**

AI assists in creating structured, investor-ready business plans aligned with proven frameworks.



**(ii) No-Code / MVP Creation through AI**

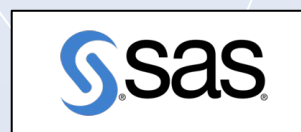
Enables entrepreneurs to develop apps, websites, or prototypes quickly without programming skills.



**(d) International and Global Business**

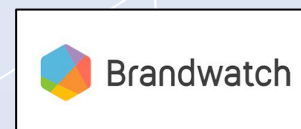
**(i) Cross-border Investment Behavioral Modeling**

Identifies patterns and predicts investment behaviors across different countries.



**(ii) Cultural/Sentiment Analytics Across Regions**

Analyzes multilingual social and media data to understand cultural attitudes and consumer preferences.



(e) **Management and Leadership**

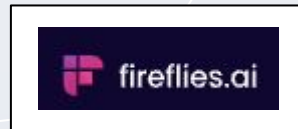
(i) **Decision Support & Predictive Modeling**

Assists leaders in making strategic decisions using AI-generated forecasts.



(ii) **Meeting Optimization & Transcript Tools**

Automates note-taking, transcription, and summarization to enhance meeting efficiency.



(f) **Marketing and Communication**

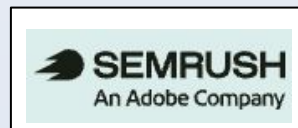
(i) **Content Generation & Creative Messaging**

Produces written, visual, or video content tailored to brand voice and audience needs.



(ii) **SEO & Market Research Insights**

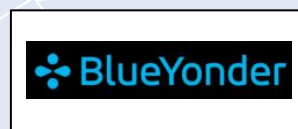
Uses AI to optimize websites for search engines and uncover competitive market trends.



(g) **Operations, Logistics & Supply Chain**

(i) **Supply Prediction & Demand Forecasting**

Predicts product demand and supply needs to avoid stockouts or overproduction.



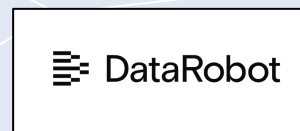
(iii) **Automated Process & Invoice Handling (RPA)**

Automates repetitive operational tasks such as invoice processing and order entry.



## 5. Computing

- (a) Cloud Computing & Virtualisation**  
AI optimizes processor design, predicts hardware failures, automates system configuration, and enables intelligent edge computing.
- (b) Computer Architecture and Embedded Systems**  
AI assists in algorithm design, complexity analysis, automated theorem proving, and optimization of computational processes.
- (c) Computer Networks**  
AI enhances network security, optimizes traffic routing, predicts network failures, and enables self-healing network architectures.
- (d) Cybersecurity**  
AI detects malware, identifies security threats, automates incident response, and provides behavioral analytics for anomaly detection.
- (e) Data Science and Analytics**  
AI powers predictive analytics, automated data preprocessing, pattern recognition, and business intelligence insights.
- (f) Information Technology / Information Systems**  
AI streamlines IT operations, automates help desk functions, optimizes system performance, and enables predictive maintenance.
- (g) Software Engineering**  
AI accelerates code generation, automates testing, assists in debugging, and optimizes software development lifecycle.



## 6. Culinary Arts

### (a) Culinary Business and Management

#### (i) Restaurant Operations & Revenue Management

AI analyzes sales data, predicts peak hours, optimizes menu pricing, and automates stock replenishment to improve efficiency and profit.



### (b) Culinary Foundations and Techniques

#### (i) Professional Cooking Skills Training

AI-powered virtual cooking assistants provide step-by-step instructions, suggest adjustments during cooking, and use image recognition to assess technique.



### (c) Food Innovation, Science & Research

#### (i) Recipe Development & Food Product R&D

AI predicts innovative flavor combinations, tests recipe variations virtually, and analyzes ingredient chemistry for better taste and texture.



### (d) Food Safety, Nutrition & Sustainability

AI monitors hygiene compliance via cameras, detects spoilage, calculates nutritional data, and recommends sustainable sourcing.



### (e) Smart Kitchen Equipment & Automation

AI-integrated ovens, grills, and fryers automatically adjust cooking times/temperatures for consistent quality and energy efficiency.



## 7. Educational Technology

**(a) Classpoint**

Engage participants seamlessly with interactive quizzes, gamification, and more - all within PowerPoint.



**(b) Diffit**

Provide a simple, trusted way to get learning materials, activities, and assessments that are differentiated by design.



**(c) Google Vids**

With just a few clicks, educators can create instructional videos that make difficult concepts more digestible.



**(d) Socrative**

Adaptive testing and personalized assessments.



**(e) Mindko**

Free AI solver to help students with biochemistry problems, providing instant solutions.



**(f) Edubrain**

Assist with generating explanations and step-by-step solutions for biochemistry homework and questions.



## 8. Education & Teaching

### (a) Early Childhood Education

#### (i) ASQ

Social-emotional learning assessment.



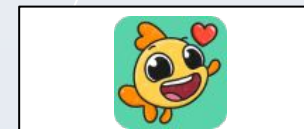
#### (ii) CDC Milestone Tracker app

Developmental milestone tracking.



#### (iii) Speech bulbs

Children's Language development and speech therapy.



### (b) Educational Administration and Leadership

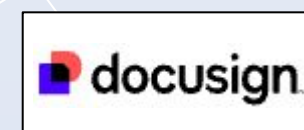
#### (i) Timely

Automate timetables, room assignments, and staff schedules.



#### (ii) DocuSign A

Automate policy compliance checks, audit trails, and document workflows.



### (c) Educational Psychology and Counselling

#### (i) Cialfo AI

Tailored career and academic counseling using student profiles, goals, and behavioral data.



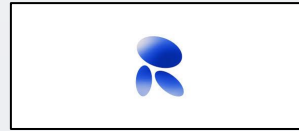
#### (ii) Cognifit

AI-assisted psychometric testing, cognitive profiling, and scenario-based training for counselors.



**(iii) Replika**

Analyze speech/text for emotional cues, stress levels, and cognitive patterns to support interventions.



**(d) Educational Technology/ e-Learning**

**(i) Century Tech**

Personalized Learning, catering to different students' needs.



**(ii) Khanmigo**

Tracking student progress based on the students.



**(e) Language Education**

**(i) Speech Ace**

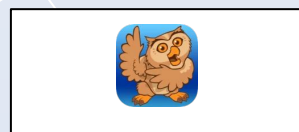
Pronunciation assessment and feedback.



**(f) Special Needs Education**

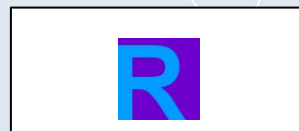
**(i) Proloquo2Go**

Assistive communication technologies.



**(ii) Rewordify**

Personalized Learning.



## 9. Engineering

**(a) Computing and Programming for Engineers**

AI assists in code optimization, automated testing, system design, and computational problem-solving across engineering domains.



**(b) Control Systems and Automation**

Predictive maintenance/ quality monitoring, AI enhances adaptive control algorithms, predictive control systems, fault detection, and autonomous system optimization.



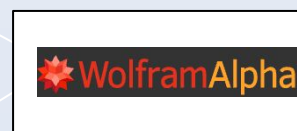
**(c) Electronics & Electrical Systems**

AI optimizes circuit design, predicts component failures, automates PCB layout, and enables smart grid management.



**(d) Engineering Mathematics and Science**

AI accelerates numerical simulations, solves complex mathematical models, optimizes engineering calculations, and enables data-driven discoveries.



**(e) Mechanical Systems & Design**

CAD design optimization. AI accelerates CAD design, optimizes material selection, enables generative design, and predicts mechanical failures.



**(f) Robotics and Mechatronics Integration**

AI enables autonomous navigation, computer vision, human-robot interaction, and adaptive robotic behaviors.



## 10. Environmental Technology

### (a) Climate Change Prediction

- (i) **Predicting temperature rise & sea-level change using climate models**

AI climate forecasting.



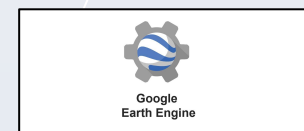
- (ii) **Simulating extreme weather events for preparedness**

Predictive analytics for climate risk.



- (iii) **Forecasting greenhouse gas (GHG) emission scenarios**

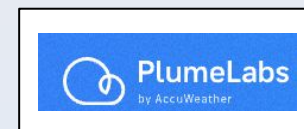
Satellite data for climate modeling.



### (b) Air Pollution and Control

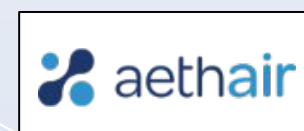
- (i) **Identifying pollution hotspots via satellite data**

Personal AI air pollution tracker.



- (ii) **AI-driven emission source detection in industries**

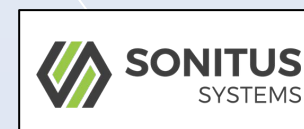
Indoor & outdoor air quality monitoring.



### (c) Noise Pollution and Control

- (i) **Classifying noise sources (traffic, industry, construction)**

Smart noise monitoring.



- (ii) **Predictive noise mapping for urban planning**

AI hearing protection for workers.



**(d) Energy Efficiency**

**(i) AI optimization of power grids & renewable energy integration**

AI for energy savings.



**(ii) Predicting energy demand to reduce waste**

Energy demand forecasting.



**(iii) Smart building energy management**

Industrial energy optimization.



**(e) Solid Waste Management**

**(i) AI-driven waste sorting via computer vision**

AI recycling robots.



**(ii) Predicting waste generation trends for better planning**

Smart waste sorting.



**(iii) Optimizing waste collection routes**

AI waste collection route optimization.



**(f) Water Quality and Treatment Water Management**

**(i) AI control of treatment plant operations**

Water network monitoring & leak detection.



**(ii) Leak detection in distribution systems**

Flood risk & water quality prediction.



**(g) Soil Science and Land Resources Management**

**(i) Predicting soil moisture & nutrient levels**

AI global soil mapping.



**(ii) AI-assisted land use planning & erosion risk mapping**

AI crop & soil analytics.



**(iii) Crop yield prediction for sustainable farming**

Precision soil management.



**(h) Biodiversity & Conservation**

**(i) Species identification from images/audio**

AI wildlife identification.



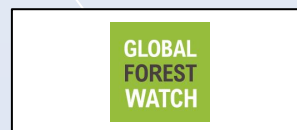
**(ii) Poaching risk prediction & wildlife tracking**

Poaching prediction.



**(iii) Habitat change detection via satellite imagery**

AI forest loss monitoring.



## 11. Finance

### (a) Banking and Financial Institutions

- (i) **Enhancing customer service (chatbots, predictive call routing, sentiment analysis), fraud detection, compliance, risk management, and boosting productivity across front, middle, and back offices**

A real-time machine learning platform for detecting fraudulent transactions and minimizing risk.

The logo for feedzaī, featuring the word "feedzaī" in a blue, lowercase, sans-serif font. The "ī" has a horizontal line above it, resembling a diacritical mark.

### (b) Corporate Finance

- (i) **Automating anomaly detection and fraud, predictive analytics, streamlining reporting and regulatory compliance**

AI agents that automate compliance checks, categorize expenses, support budgeting and procurement processes.

The logo for ramp, featuring the word "ramp" in a dark grey, lowercase, sans-serif font, followed by a small, stylized grey icon of a ramp or arrow pointing up and to the right.

### (c) Financial Markets and Instruments

- (i) **AI-driven predictive trading, liquidity scoring, automated bond issuance and smart order routing**

uses AI for fixed-income analytics and automated credit trading (smart order routing).

The logo for Overbond, featuring the word "Overbond" in a bold, black, sans-serif font, followed by a small red square icon.

### (d) Financial Planning and Wealth Management

- (i) **Portfolio rebalancing, risk assessment, client onboarding, personalized advice, content generation, and productivity tools**

A proprietary tool used by ~52,000 employees to improve onboarding, KYC, and adviser support.

The logo for UBS, featuring a black icon of a cross with four keys (the UBS logo) to the left of the word "UBS" in a bold, red, sans-serif font.

**(e) Financial Technology (FinTech) and Innovation**

**(i) Generative AI integration to innovate customer experiences, automation, and operational efficiency**

AI-powered fintech platform building conversational assistants and personalized investment tools.



**(f) Risk Management and Insurance**

**(i) Real-time fraud detection, risk assessment, compliance automation in insurance and financial institutions**

AI-based analytics for fraud, risk assessment, regulatory compliance across financial services and insurance.



## 12. Food Science

### (a) Food Industry Management

- (i) Demand forecasting, supply chain optimization, price prediction.
- (ii) Consumer behavior analysis & market trend prediction.



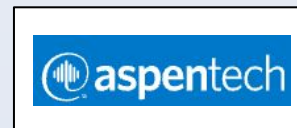
### (b) Food Microbiology

- (i) Predictive tools to perform microbial risk assessments (QMRA), model microbial responses, predictive model databases.
- (ii) Pathogen identification & research.



### (c) Food Processing and Engineering

- (i) Process optimization, energy efficiency, and automation.
- (ii) Equipment fault detection & predictive maintenance.



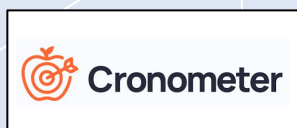
### (d) Food Quality and Sensory Evaluation

- (i) Image-based quality grading (color, size, defects).



### (e) Nutrition and Dietetics Interface

- (i) Dietary intake tracking & analysis.
- (ii) Clinical nutrition decision support.



## 13. Hotel Management

### (a) Front Office and Guest Services

- (i) Hotel occupancy forecasting using historical booking patterns, local event data, and seasonal trends to optimize room pricing and staffing.



### (b) Food & Beverage (F&B) Management

- (i) AI-powered menu optimization and demand prediction to reduce food waste and forecast ingredient needs based on customer preferences and seasonality.
- (ii) AI-driven tools and platforms designed to reduce food waste through smarter inventory management and predictive analytics.



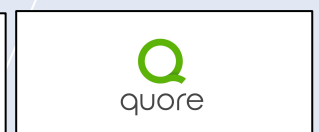
### (c) Hospitality Business and Management

- (i) AI-based business intelligence for dynamic pricing, financial forecasting, and operational efficiency tracking.



### (d) Housekeeping and Accommodation Operations

- (i) Predictive maintenance and smart scheduling of cleaning tasks based on guest check-in/out patterns and real-time occupancy data.



## 14. Medicine

### (a) Biomedical Instrumentation

- (i) Medical imaging & diagnostics (MRI, CT, X-ray).
- (ii) Robotic surgery.
- (iii) Prosthesis (interpret signals from a user's nerves or muscles to control the movement of a prosthetic limb).



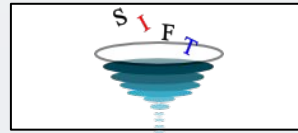
### (b) Biostatistics

- (i) Predictive Modeling and Risk Assessment.
- (ii) Automating Data Analysis.
- (iii) Genomics and Omics Data Analysis.



**(c) Genomics & Bioinformatics**

(i) AI-based prediction of whether amino acid substitutions affect protein function.



(ii) Machine learning workflows for genomics data analysis with pre-built AI models.



**(d) Human Physiology**

(i) Machine learning algorithms in their portable ECG devices (KardiaMobile) for detecting atrial fibrillation and other arrhythmias.

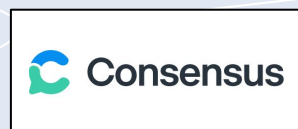


(ii) Digital stethoscopes with AI that can detect heart murmurs, atrial fibrillation, and other cardiac conditions during routine examinations.



**(e) Immunology**

(i) Used to quickly understand the current state of immunology research.



(ii) Phenotyping of immune cells in microscopy images.



**(f) Medical Imaging**

(i) Analyze the CT scan results, X-ray.



(ii) AI algorithms embedded in CT and MRI machines for automated detection of conditions like pneumothorax, brain bleeds, and bone fractures.



**(g) Molecular Biology**

(i) Automated cell type annotation for single-cell transcriptomics using machine learning classifiers.



(ii) ChromSword Auto - AI-powered method development for HPLC separations with automated optimization.



**(h) Pathology**

(i) Integrated with digital pathology scanners to analyze tissue samples and assist pathologists in cancer diagnosis.

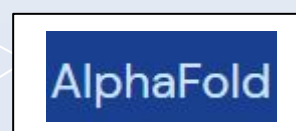


(ii) AI-powered cancer detection and diagnosis platform for gastric, prostate, breast, and skin pathology with real-time analysis capabilities.



**(i) Pharmacology**

(i) Predicts protein 3D structures from amino acid sequences.



(ii) Predict drug pharmacokinetics and toxicity.



**(j) Anatomy**

- (i) Teaching learning purpose.



**(k) Biochemistry**

- (i) Machine learning models integrated with the BRENDA enzyme database for predicting enzyme kinetics, substrate specificity, and optimal reaction conditions.



- (ii) Web-based platform with machine learning tools for metabolomics data analysis, pathway enrichment, and biomarker discovery.



- (iii) An AI-powered platform that performs detailed dietary analysis to create customizable nutrition plans for preventing and managing chronic diseases.



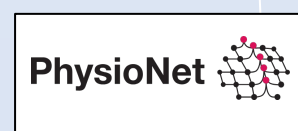
**(l) Pathology**

- (i) Digital histopathology with deep-learning for slide segmentation, detection of cancerous regions, grading and quantitative metrics; stain normalization and quality control; AI-assisted triage of cases and generation of structured pathology reports to support teaching and research.



**(m) Physiology**

- (i) AI models for physiological signal analysis (ECG, PPG, respiratory traces); predictive models for hemodynamics and glucose dynamics; virtual patient simulators that adapt to learner input.



**(n) Anaesthesiology**

- (i) Predictive Analytics and Risk Assessment.



**(o) Dermatology**

- (i) Skin Cancer Screening and Diagnosis.



**(p) Family Medicine**

- (i) Differential diagnosis.



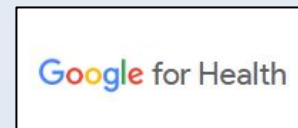
**(q) General Surgery**

- (i) Human patient simulator provides flexible training scenarios altered to suit wide range.



**(r) Internal Medicine**

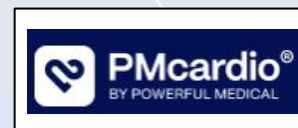
- (i) Useful in oncology metastasis of tumors.



- (ii) AI-powered decision support for diagnostics and treatment planning.

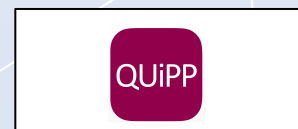


- (iii) AI powered ECG interpretation.



**(s) Obstetrics & Gynaecology**

- (i) Prediction of spontaneous preterm birth.



- (ii) Digital Pap screening.



**(t) Ophthalmology**

- (i) Screening and Diagnosis of Retinal Diseases.

The logo for OPTOMED, featuring the word "OPTOMED" in a bold, blue, sans-serif font. The letter "O" is stylized with a white circle inside it.

**(u) Orthopaedics**

- (i) Surgical Planning and Navigation.

The logo for Stryker, featuring the word "stryker" in a bold, black, lowercase, sans-serif font.

**(v) Paediatrics**

- (i) Tracks developmental milestones and recommends appropriate nutritional recommendations.

The logo for Jiguar, featuring the word "Jiguar" in a purple, sans-serif font. To the left of the word is a small icon of two stylized figures. Below the word is the tagline "The Village Your Child Needs" in a smaller, black, sans-serif font.

**(w) Psychiatry**

- (i) Decision support system for depression treatment.

The logo for Ax, featuring the letters "Ax" in a green, sans-serif font. The letter "A" is stylized with a white circle inside it.

**(x) Public Health**

- (i) Infectious disease surveillance and outbreak prediction.

The logo for bluedot, featuring a blue lowercase letter "b" with a white circle inside it. Below the letter is the word "bluedot" in a smaller, blue, lowercase, sans-serif font.

- (ii) Preventive screening tracking.

The logo for Care Evolution, featuring a stylized sunburst icon to the left of the words "Care Evolution" in a black, sans-serif font.

**(y) Radiology**

- (i) Highly efficient, sensitive and specific identification of radiological images.

The logo for aidoc, featuring the word "aidoc" in a bold, blue, lowercase, sans-serif font. The letter "i" is stylized with a white circle inside it.

- (ii) Incorporates case based TL resources.

The logo for Anatomage, featuring the word "Anatomage" in a purple, italicized, serif font.

## 15. Pharmacy

### (a) Medicinal Chemistry

- (i) Open-source toolkit for deep learning in drug discovery (molecular featurization, QSAR modeling, and virtual screening).



### (b) Pharmaceuticals - Sterile Dosage Forms

- (i) AI-powered platform for aseptic manufacturing that enables contamination risk prediction, real-time process and environmental monitoring, sterilization optimization, automated quality inspection, batch review, SOP generation, regulatory documentation, and training for sterile operations.



### (c) Pharmaceuticals - Solid Dosage Forms

- (i) AI platform for formulation optimization, stability prediction, process monitoring, quality control, packaging inspection, documentation, and regulatory compliance automation.



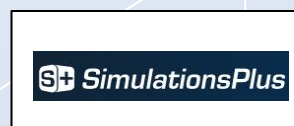
### (d) Pharmaceuticals - Advanced Drug Delivery Systems

- (i) AI platform for drug delivery system design, formulation optimization, release prediction, particle analysis, stability modeling, and regulatory documentation automation.



### (e) Physical Pharmacy

- (i) AI platform for physicochemical property prediction, formulation optimization, dissolution and stability modeling, material characterization, and literature-driven decision support.



# LIST OF QIU UNIVERSITY TRAINERS

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Prof. Dr. Tina Lim Swee Kim	Academic Affairs Division
Assoc. Prof. Dr. Suki Chin Sook Fui	Academic Affairs Division
Ms. Kan Poh Yi	Academic Affairs Division
Assoc. Prof. Ir. Ts. Dr. Mah Siew Kien	Faculty of Computing and Engineering

FACULTY	FIELD	TRAINERS
Faculty of Business and Management	Business and Management	Prof. Dr. Jeffrey Yee Khong Loong
	Hotel Management	Assoc. Prof. Dr. Ng Mei Ling
	Business and Administration	Dr. Aervina Misron
	Finance	Ms. Chen Yuen Nee
	Culinary Arts	Ms. Noor Asneeda Ishak
	Accountancy	Ms. Nurul Atikah Kamaruddin
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	Computing and Information Technology	Ms. Nur Syaheera Sulaiman
	Engineering	Ms. Norhidayah Ahmad
Faculty of Integrated Life Sciences	Microbiology/ Molecular Biology	Assoc. Prof. Dr. Wendy Liu Ying Ying
	Biotechnology	Assoc. Prof. Dr. Kamariah Hasan
	Environmental Technology	Dr. Siti Nor Aishah Mohd Salleh
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	Medicine (Preclinical)	Prof. Dr. Ong Khang Wei
	Biomedical Sciences	Assoc. Prof. Dr. Annie Poh Woon Cheng
	Medicine (Clinical)	Assoc. Prof. Dr. Kyaw Zaw Win
Faculty of Pharmacy	Pharmacology	Prof. Dr. Syed Atif Abbas
	Clinical Pharmacy and Pharmacy Practice	Dr. Tan Boon Seng
Faculty of Social Sciences	English	Prof. Dr. Ranjit Singh Gill
	Education	Dr. Ruuhina Mohd Sani
	Early Childhood Education	Ms. Aida Diyana Nabila
	Communication	Ms. Nabillah Rafidah Abdul Kadir
	English	Ms. Pavinder Kaur
	Psychology	Mr. Muthualagan Thangavelu



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# APPENDIX 1

## [Template] AI in Curriculum

The word format of this document can be accessed from the QIU Open Educational Resources (OER) Hub [here](#).



### [TEMPLATE] AI in Curriculum

Faculty				
Field				
Discipline	Application of AI <i>Describe how AI enhances or automates work in the given discipline.</i>	Name of Specific AI Tool	Related Course(s)	
E.g. 1 Business Analytics and Technology	Decision Support and Data Insights - Leverages AI to analyze large datasets and recommend data-driven business strategies.	IBM watsonx	Managing Digital Business	
E.g. 2 Professional Cooking Skills Training	AI-powered virtual cooking assistants provide step-by-step instructions, suggest adjustments during cooking, and use image recognition to assess technique.	Chef Watson by IBM	International Cuisine	
E.g. 3 Artificial Intelligence (AI) & Machine Learning (ML)	Natural language processing for chatbots and translation. Core discipline developing intelligent systems, neural networks, deep learning models, and algorithm optimization for various applications	TensorFlow, PyTorch	Introduction to IT Programming in C++	
1				
2				
3				
4				



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## APPENDIX 2A

### [Template] Gen AI in Teaching and Learning

#### Concept Mapping with Napkin AI

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### [TEMPLATE] Concept Mapping with [Napkin AI](#)

<b>Scenario</b>	Concept Mapping at the <b>End of a Unit/ Topic</b>
<b>Goal</b>	<b>Summarise key ideas from the unit through collaborative visualisation</b>

Steps to Use Napkin AI	
<b>Step 1</b> Preparation	
<b>Step 2</b> Paste into Napkin AI	
<b>Step 3</b> Refine the Map Collaboratively	
<b>Step 4</b> Facilitate Peer Explanation	
<b>Step 5</b> Export or Present	

**Note:** For other use cases of concept mapping, refer to [this](#) and adapt the above accordingly.



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## APPENDIX 2B

### [Template] Gen AI in Teaching and Learning

#### Reciprocal Teaching with NotebookLM

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### [TEMPLATE] Reciprocal Teaching with [NotebookLM](#)

Implementation Details				
Media				
Step	Role			
<b>Step 1</b> Assign Reciprocal Teaching Roles	Predictor	Questioner	Clarifier	Summariser
<b>Step 2</b> Independent Work Without AI				
<b>Step 3</b> AI as a Peer Reviewer				
<b>Step 4</b> Metacognitive Discussion				

**Note:** For other forms of media, refer to [this](#) and adapt the above accordingly.



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## APPENDIX 2C

### [Template] Gen AI in Teaching and Learning

#### Jigsaw Activity with Perplexity

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### [TEMPLATE] Jigsaw Activity with [Perplexity](#)

Steps to Design Jigsaw Activity with Perplexity	
<b>Step 1</b> Clarify Your Purpose	
<b>Step 2</b> Gather Materials for Input	
<b>Step 3</b> Design with AI Assistance	
<b>Step 4</b> Facilitate, Reflect, Assess	
<b>Step 5</b> Structure the Jigsaw Components	



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## APPENDIX 2D

### [Template] Gen AI in Teaching and Learning

#### Think-AI-Pair-Share

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### [TEMPLATE] Think-AI-Pair-Share

Steps to Implement Think-AI-Pair-Share	
<b>Step 1</b> Think	
<b>Step 2</b> AI	
<b>Step 3</b> Pair	
<b>Step 4</b> Share	



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## APPENDIX 2E

### [Template] Gen AI in Teaching and Learning

#### Role-Play with AI

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### [TEMPLATE] Role-Play with AI

Steps to Design Role-Play with AI	
<b>Step 1</b> Prepare	
<b>Step 2</b> Prompt	
<b>Step 3</b> Role-Play	
<b>Step 4</b> Reflect	



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# APPENDIX 3A - ANALYSE

## [Template] Play Cards For Gen AI Embedded HOTS Activities

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### [Play Card 1-Analyse] Gen AI-Integrated Classroom Activities

Course Lecturer	
Programme	
Course Code & Course Name	
Course Learning Outcome(s)	

#### Bloom's Taxonomy: To Analyse

Steps		
1	Students use Gen AI to compare and contrast, and formulate a research question or hypothesis where applicable	
2	Students reflect on Gen AI output and where relevant, create data visualisation to assist in the analysis	
3	Students cite relevant concepts/ principles and/ or case studies	



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## APPENDIX 3B - EVALUATE

### [Template] Play Cards For Gen AI Embedded HOTS Activities

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#### [Play Card 2-Evaluate] Gen AI-Integrated Classroom Activities

Course Lecturer	
Programme	
Course Code & Course Name	
Course Learning Outcome(s)	

#### Bloom's Taxonomy: To Evaluate

Steps	Topic
1 Students analyse the information using Gen AI	
2 Students cross reference and verify Gen AI output and write a diagnosis (e.g., key insights, root cause of issue and/ or implications)	
3 Students propose a plan	
4 Students give justification/ reasons for action taken based on own insights/ findings/ lecture notes	



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## APPENDIX 3C - CREATE

### [Template] Play Cards For Gen AI Embedded HOTS Activities

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QUEST INTERNATIONAL UNIVERSITY

#### [Play Card 3-Create] Gen AI-Integrated Classroom Activities

Course Lecturer	
Programme	
Course Code & Course Name	
Course Learning Outcome(s)	

#### Bloom's Taxonomy: **To Create**

	Steps	Topic
1	Lecturer provides clear, specific and detailed criteria for students to create an initial draft using Gen AI	
2	Students critique the draft generated by AI, either individually or in groups	
3	Students improve on the draft	
4	Students give justification/reasons for action taken	



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## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (1)

Topic: Research Proposal	Topic: Fundamentals of Food
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students work in pairs, with Student 1 using ChatGPT and Student 2 using Perplexity, to respond to the same scenario provided by the instructor.</li><li>• Each student must prompt their assigned AI tool to construct a Problem Statement and identify Research Gaps, ensuring that the output includes in-text citations from recent (past 5 years) Scopus-indexed journals and a complete APA-style reference list.</li><li>• Once both outputs are generated, students compare and contrast the results, focusing on differences in content accuracy, depth of analysis, citation quality, and relevance to the scenario.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• Students use Gen AI to compare two culinary techniques and formulate a precise research question or hypothesis to investigate.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students must then reflect critically on the outputs, identifying any underlying assumptions or biases and inferring the logical structure of the arguments presented.</li><li>• Where relevant, students should create data visualisations (e.g., comparison tables, Venn diagrams, or thematic maps) to assist in illustrating their analysis.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Students critically review Gen AI's suggestions, identifying patterns, anomalies, or missing perspectives.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• The discussion must integrate relevant concepts, principles, and/or case studies to support the evaluation of the provided scenario.</li><li>• Students are then required to present their analysis.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Students link their analysis to culinary science principles, industry practices, or documented case studies.</li></ul>
Creator: Aervina Mison	Creator: Noor Asneeda Ishak



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (2)

Topic: Risk Management	Topic: Market Segmentation
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students use Gen AI to compare and contrast different methods of classifying risk, cost of risk concepts, pooling arrangements, diversification strategies, and management objectives.</li><li>• Formulate a relevant research question or hypothesis based on the findings.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• In pairs, students use any generative AI to generate examples of market segmentation for a selected product or service (e.g., Mazda Malaysia, kayak.com) without specifying market segments the examples belong to.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students critically reflect on the AI-generated output, identifying strengths, gaps, and biases.</li><li>• Students to create data visualisations (e.g., risk heat maps, cost-benefit charts, pooling simulations) to clarify patterns and to support deeper analysis.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Students to group the examples generated without the help of generative AI</li><li>• Then, use the generative AI to provide the specific market segments for each of the examples.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students to integrate relevant concepts, principles, and/or real-world case studies to strengthen their analysis.</li><li>• Demonstrate how theory translates into practical solutions for building management risk scenarios.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Discuss whether the examples accurately represent behavioural, demographic, geographic and psychographic segmentation.</li><li>• Discuss the relevance of additional market segments and corresponding examples generated by generative AI</li></ul>
Creator: Chen Yuen Nee	Creator: Jeffrey Yee Khong Loong



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (3)

Topic: Food & Beverage Industry Analysis
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students use Gen AI to compare and contrast the characteristics of different sectors of the Food and Beverage industry.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• From the AI generated comparisons, students analyse the impact of these characteristics on the sector's market, food production methods and food service methods.<ul style="list-style-type: none"><li><input type="checkbox"/> Type of market – customer profile</li><li><input type="checkbox"/> Type of production methods</li><li><input type="checkbox"/> Type of service methods</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students assess whether these characteristics can accurately reflect the food and beverage sectors in Malaysia.</li><li>• Compare generated information with 'Malaysia Standard Industrial Classification'</li></ul>
Creator: Ng Mei Ling



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (4)

Topic: Ledger and Trial Balance
<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides the scenario: You are the junior accountant of ABC Trading. The following transactions occurred in March 2025:<ul style="list-style-type: none"><li><input type="checkbox"/> 1 Mar: Owner invested RM 50,000 cash into the business.</li><li><input type="checkbox"/> 3 Mar: Purchased equipment RM 12,000 on credit from Tech Supplies.</li><li><input type="checkbox"/> 8 Mar: Made cash sales RM 7,500.</li><li><input type="checkbox"/> 12 Mar: Paid RM 2,500 to Tech Supplies.</li><li><input type="checkbox"/> 15 Mar: Paid utilities RM 800 cash.</li><li><input type="checkbox"/> 20 Mar: Received RM 1,200 from a customer for services to be performed in April.</li><li><input type="checkbox"/> 25 Mar: Owner withdrew RM 1,000 cash for personal use.</li><li><input type="checkbox"/> Students need to prepare a ledger and trial balance manually.</li></ul></li><li>• Students need to input the information given above into ChatGPT (or similar AI).</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students prepare a one-page Reflection Report including:<ul style="list-style-type: none"><li>- Side-by-side ledger &amp; trial balance (Manual vs AI)</li></ul></li><li>• Lecturer asks:<ul style="list-style-type: none"><li><input type="checkbox"/> What differences did you observe between your manual trial balance and the AI-generated trial balance?</li><li><input type="checkbox"/> If the trial balance does not balance, what types of errors could be present?</li><li><input type="checkbox"/> How did you decide on the debit or credit entry for each transaction?</li><li><input type="checkbox"/> Why must total debits equal total credits in the trial balance?</li></ul></li></ul> <p>In the scenario given, which accounts are classified as assets, liabilities, equity, revenue, and expenses?</p>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students apply relevant fundamental accounting concepts (such as the classification of debit and credit, the classification assets, liabilities, equity, revenue, and expenses) of relevance to ledger and trial balance preparation.</li></ul>
Creator: Nurul Atikah Binti Kamaruddin



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (1)

<p>Topic: Optimising Logic Circuit Design for Energy Efficiency in Mechatronic Systems</p>	<p>Topic: Semiconductor Diodes</p>
<p>Step 1</p> <p><b>Students prompt a Gen-AI tool to:</b></p> <ul style="list-style-type: none"> <li>• Compare two or more low-power logic circuit design approaches (e.g., CMOS vs. pass-transistor logic, synchronous vs. asynchronous design)</li> <li>• Highlight trade-offs in power consumption, speed, and complexity. Students then formulate:</li> <li>• A research question (e.g., "How can asynchronous logic design reduce power consumption in sensor interface modules for robotic arms without affecting timing reliability?")</li> <li>• Or a hypothesis (e.g., "Using pass-transistor logic will reduce total power consumption by at least 15% in a mechatronic sensor module.")</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>• In groups of two, using different Generative AI tools, students are to compare the types of bias connections in semiconductor diodes. The comparison must include the following parameters: <ul style="list-style-type: none"> <li><input type="checkbox"/> The circuit connection,</li> <li><input type="checkbox"/> The working principle of the connection,</li> <li><input type="checkbox"/> The total current exists,</li> <li><input type="checkbox"/> The different models of diodes,</li> <li><input type="checkbox"/> The depletion region.</li> </ul> </li> </ul>
<p>Step 2</p> <p><b>Reflect, Analyse, and Visualise</b></p> <ul style="list-style-type: none"> <li>• Students review AI-generated comparisons and validate them against textbook data or datasheets.</li> <li>• Use simulation software (Logisim, Quartus, Proteus) to gather their own performance metrics.</li> <li>• Create data visualisations (graphs, heatmaps, logic timing diagrams) that compare AI predictions vs. actual simulated results.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>• Students assess the similarities and differences between the AI-generated explanations and need to identify any assumptions or biases in the AI explanations.</li> </ul>
<p>Step 3</p> <p><b>Cite Relevant Concepts and Cases</b></p> <ul style="list-style-type: none"> <li>• Students integrate: <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Digital electronics concepts</b> (Boolean simplification, Karnaugh maps, flip-flop timing, clock domain crossing).</li> <li><input type="checkbox"/> <b>Case studies</b> of real-world low-power designs (IoT devices, wearable robotics, industrial control systems).</li> <li><input type="checkbox"/> <b>Ethical considerations</b> in AI-assisted engineering design. Students must <b>cite all sources</b> properly, including Gen-AI prompts/output and scholarly references.</li> </ul> </li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>• Students cite any relevant references (textbook or journal paper) at-least 5 updated references.</li> <li>• Students summarise the final explanation that integrates the most accurate and consistent information from all the sources.</li> </ul>
<p>Creator: Mah Siew Kien</p>	<p>Creator: Norhidayah Ahmad</p>



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (2)

Topic: Trapezium Method and Simpson's Rule	Topic: Scatter Plots and Regression Lines
<p>Step 1</p> <p>In groups of three, students conduct a comparative analysis of the Trapezium Method and Simpson's Rule in the context of numerical techniques for approximating definite integrals by using different Gen AI in terms of:</p> <ul style="list-style-type: none"><li>• Accuracy (compare results to the exact analytical solution)</li><li>• Computational complexity</li><li>• Advantages and disadvantages of each method</li><li>• Scenarios where one method is preferable over the other</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are given data and asked to use Gen AI to generate the scatter plot with regression line and compare the effects interpretation.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students analyse the AI output critically by checking for biases, missing information, or flawed reasoning and produce data visualisations to aid analysis.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Students make the comparative analysis report with visuals, bias discussion, and justification for the chosen graph for fair representation.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students ascertain the accuracy of the Trapezium Method and Simpson's Rule results by citing relevant concepts and mathematical principles such as order of accuracy, error estimation formulas.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Students cite relevant statistical principles that explain why each identified inaccuracy/ bias matters and support with reference at least one real-world case study where similar statistical bias.</li></ul>
Creator: Nurtasnim Ismail	Creator: Nurtasnim Ismail



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (3)

Topic: T-Test and ANOVA
Step 1 <ul style="list-style-type: none"><li>Students prompt Gen AI to outline the steps of a statistical proof or analytical method steps in T test and ANOVA .</li></ul>
Step 2 <ul style="list-style-type: none"><li>Students annotated flowchart showing the corrected logical structure with explanations for each modification.</li><li><i>Analyse</i> – Identify logical structure and infer missing or flawed reasoning.</li></ul>
Step 3 <ul style="list-style-type: none"><li>Students identify the selected statistical concepts/principles clearly align with the methods and procedural steps from reliable sources such as text books.</li></ul>
Creator: Nurtasnim Ismail



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (4)

Topic: HCI – Website with Good UI
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students prompt Gen AI to compare two websites from the same domain (e.g., two e-commerce platforms) using HCI/ UI principles such as:<ul style="list-style-type: none"><li>❑ Layout and navigation structure</li><li>❑ Consistency and standard</li><li>❑ Visibility of system status</li><li>❑ Error prevention and recovery</li><li>❑ Accessibility compliance (e.g., WCAG)</li></ul></li><li>• From the AI's comparison, students formulate a research question or hypothesis, e.g.: <i>"Does a simplified checkout flow reduce cart abandonment rates?"</i></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students assess AI-generated comparisons of website UIs for alignment with established HCI guidelines and any prior usability research.</li><li>• Lecturer asks what/provides additional input could make the analysis more accurate, e.g.:<ul style="list-style-type: none"><li>❑ Results from real user testing sessions</li><li>❑ Target audience personas and demographics</li><li>❑ Device/browser constraints</li></ul></li><li>• Students use <b>Napkin.ai</b> to create visualisations such as:<ul style="list-style-type: none"><li>❑ Heatmaps showing predicted user attention</li><li>❑ Navigation flow diagrams</li><li>❑ Side-by-side annotated screenshots highlighting usability issues or strengths</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students apply relevant (provide the listed principle for students, min how many) HCI principles (e.g., Nielsen's 10 Usability Heuristics, Norman's principles) to assess Gen AI's output.</li><li>• Students refer to usability metrics (e.g., SUS scores, task success rates) from peer-reviewed case studies or industry reports to verify the AI's conclusions.</li><li>• Students critically assess whether the AI output:<ul style="list-style-type: none"><li>❑ Adequately addresses accessibility (e.g., WCAG compliance)</li><li>❑ Considers cross-cultural usability differences</li><li>❑ Accounts for interaction efficiency and error prevention</li></ul></li><li>• Students cite academic sources (lecturer provide the source), UX guidelines, or real-world usability studies to justify corrections or improvements to the AI-generated analysis.</li></ul>
Creator: Nur Syaheera Sulaiman



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (1)

Topic: Bioremediation Processes
<p>Step 1</p> <ul style="list-style-type: none"><li>Students use Gen AI to compare and contrast the different types of bioremediation processes including the different microbes used for the process (bacteria, algae, fungi and archaea). The different techniques such as in-situ and ex-situ bioremediation as well as microbe's roles and advantages and limitations.</li></ul> <p>Students identify key factors including:</p> <ul style="list-style-type: none"><li>Types of bioremediations</li><li>Different Microbes used for remediation</li><li>Sites of contamination – soil or water</li><li>Advantages</li><li>Limitations</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>After receiving AI-generated comparisons, students are provided with examples of bioremediation process such as oil spill clean-up, heavy metal immobilization, acid mine drainage treatment, pesticide degradation, plastic waste degradation and others.</li></ul> <p>Students then reflect on:</p> <ul style="list-style-type: none"><li>How does this new information shift the choice of remediation technology?</li><li>Would the AI's suggested solution still be appropriate in a specific bioremediation context?</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students critically assess whether the Gen AI output:</li><li>Students reflect on a bioremediation case study – they should connect the case to microbiological concepts, environmental impact, and problem-solving approaches.</li></ul>
Creator: Kamariah Hasan



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (2)

Topic: Conventional and Non-Conventional Energy Sources
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students use Gen AI to compare and contrast the <b>sources and environmental impacts</b> of one (1) <b>conventional energy source</b> and one (1) <b>non-conventional energy source</b> of the same energy type.</li><li>• Example Energy Type &amp; Sources:<ul style="list-style-type: none"><li><input type="checkbox"/> Conventional: Coal-fired power plant (electricity from burning coal)</li><li><input type="checkbox"/> Non-Conventional: Biomass-fired power plant (electricity from agricultural waste, wood pellets, or organic residues)</li></ul></li><li>• Students prompt Gen AI to:<ul style="list-style-type: none"><li><input type="checkbox"/> Describe the source of each energy type.</li><li><input type="checkbox"/> Compare their greenhouse gas emissions, air pollutants, and land/water impacts.</li><li><input type="checkbox"/> Discuss their sustainability and potential for future use.</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• After receiving AI-generated comparisons, students are provided with the real industry data, such as case studies from real renewable energy projects.</li><li>• Examples include: Energy Type: Electricity – Thermal  Real Industry Examples: Conventional Energy:<ul style="list-style-type: none"><li><input type="checkbox"/> Drax Power Station (UK) – originally coal-fired, now partially converted to biomass</li></ul> Non-Conventional Energy:<ul style="list-style-type: none"><li><input type="checkbox"/> Roeselare Biomass Plant (Belgium) – generates heat and power from organic waste</li><li><input type="checkbox"/> Students then reflect and cross-check with current industry performance data.</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students critically assess whether the Gen AI output:<ul style="list-style-type: none"><li>• Accurately describes the sources and operational processes of both energy types.</li><li>• Correctly identifies environmental impacts (e.g., greenhouse gas emissions, land use, air pollutants).</li><li>• Reflects current industry performance data and technological developments.</li><li>• Considers sustainability, scalability, and policy context for each project.</li><li>• Students cite academic sources, regulations, or engineering design standards to justify corrections or improvements to the AI output.</li></ul></li></ul>
Creator: Siti Nor Aishah Mohd Salleh



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (3)

Topic: Global vs Local Sequence Alignment
<p>Step 1</p> <ul style="list-style-type: none"><li>Students generate a comparison between global alignment and local alignment methods used to identify two given sequences.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students assess the output obtained from both methods of alignment based on prior knowledge about the source of these two sequences.</li><li>Lecturer asks what input can be included for a more accurate analysis - same length of sequence, ensuring analysing the sequence identity, similarity and percent gap.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students apply these important parameters to assess the Gen AI's output.</li><li>Students refer to existing sequences and alignment in the public database (NCBI).</li></ul>
Creator: Wendy Liu Ying Ying



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine (1)

Topic: qPCR Data Analysis and the Central Dogma	Topic: Pre vs Post-Septal Infections
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students analyse the qPCR data using appropriate tool</li><li>• Interpret the results with statistical evidence</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are asked: What are the distinct anatomical structures present both pre- and post-orbital septum?</li><li>• Students list down the fundamental differences between hordeolum and chalazion and check their list with an AI generated list.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students present the data analysis and outcome using graphical tools.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Students describe the management of pre-orbital septum infection.</li><li>• Students discuss the management of post-orbital septum infection (orbital cellulitis).</li><li>• Students cross check their answers with that from a Gen AI output.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students correlate the analysis outcome with the principle of central dogma event in molecular biology</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Students discuss the fundamental principles underlying the varying management approaches employed for similar symptoms of lid dysfunction.</li></ul>
Creator: Annie Poh Woon Cheng	Creator: Kyaw Zaw Win



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine (2)

Topic: Hypokalemia vs Hyperkalemia
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students prompt Gen AI: "Compare and contrast the pathophysiology, clinical features, and management principles of hypokalemia vs. hyperkalemia, including ECG changes and emergency interventions."</li><li>• They use the AI output to make a structured comparison table and then formulate a research question, e.g., "In acute care, does early ECG monitoring reduce adverse cardiac events in hyperkalemia compared to hypokalemia?"</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students review AI responses for accuracy and cross-check with standard references (e.g., Harrison's Internal Medicine, NICE guidelines). They then produce a side-by-side infographic showing the differences in causes, symptoms, ECG changes, and first-line treatment approaches for both electrolyte disturbances.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students link the differences to key physiological principles (resting membrane potential, effect of potassium on cardiac conduction) and cite case reports (e.g., potassium-related cardiac arrest in ICU settings).</li></ul>
Creator: Darryl Ong Khang Wei



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine (3)

Topic: Comparative Study of Malaria Parasites
<p>Step 1</p> <p><b>Compare, Contrast and Hypothesize (Use Gen AI)</b></p> <ul style="list-style-type: none"><li>• Students use AI tools to generate comparative analyses and formulate research questions.</li><li>• Compare and contrast the four main Plasmodium species (P. falciparum, P. vivax, P. ovale, P. malariae) in terms of:</li></ul> <p><b>Morphological characteristics in different life cycle stages</b></p> <ul style="list-style-type: none"><li>• Geographic distribution patterns</li><li>• Clinical manifestations and severity</li><li>• Dormancy capabilities and relapse patterns</li></ul> <p><b>Analyse relationships between:</b></p> <ul style="list-style-type: none"><li>• Vector behaviour (Anopheles species) and transmission patterns</li><li>• Host immune responses and parasite evasion mechanisms</li></ul> <p><b>Formulate hypotheses such as:</b></p> <ul style="list-style-type: none"><li>• "Why does P. falciparum cause more severe disease than other species?"</li><li>• "What factors determine diagnostic test sensitivity across different species?"</li></ul>
<p>Step 2</p> <p><b>Reflect and Visualize (Analyze AI Output)</b></p> <ul style="list-style-type: none"><li>• Students critically evaluate AI-generated content and create visual representations.</li></ul> <p><b>Critically assess AI outputs for:</b></p> <ul style="list-style-type: none"><li>• Accuracy of morphological descriptions</li><li>• Completeness of life cycle information</li><li>• Gaps in pathogenesis explanations</li></ul> <p><b>Create data visualizations to illustrate:</b></p> <ul style="list-style-type: none"><li>• Comparative life cycle timelines across species</li><li>• Diagnostic test performance comparison charts</li></ul> <p><b>Identify patterns in:</b></p> <ul style="list-style-type: none"><li>• Seasonal transmission variations</li><li>• Diagnostic challenges in different clinical settings</li></ul>
<p>Step 3</p> <p><b>Apply Concepts and Case Studies (Synthesize Learning)</b></p> <ul style="list-style-type: none"><li>• Students connect findings to established medical principles and real-world scenarios.</li></ul> <p><b>Cite relevant microbiological principles:</b></p> <ul style="list-style-type: none"><li>• Host-parasite interaction mechanisms</li><li>• Antigenic variation and immune evasion</li><li>• Vector-borne disease transmission dynamics</li><li>• Diagnostic test principles (microscopy, RDTs, PCR)</li></ul> <p><b>Apply pathogenesis concepts:</b></p> <ul style="list-style-type: none"><li>• Hemolysis and anemia development</li><li>• Cerebral malaria pathophysiology</li><li>• Cytokine storm and inflammatory responses</li><li>• Sequestration and microvascular obstruction</li></ul> <p><b>Analyze case studies demonstrating:</b></p> <ul style="list-style-type: none"><li>• Differential diagnosis challenges in returning travelers</li><li>• Treatment failures and drug resistance patterns</li><li>• Prevention strategy effectiveness in endemic regions</li></ul> <p><b>Evaluate public health measures:</b></p> <ul style="list-style-type: none"><li>• Vaccine development challenges and progress</li><li>• Elimination vs. control strategies</li><li>• Community health interventions</li></ul>
Creator: Ranjith Mehenderkar



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine (4)

Topic: VZV and Other Herpes Viruses
<p>Step 1</p> <p><b>Compare, Contrast ND Hypothesize (Use Gen AI)</b></p> <ul style="list-style-type: none"><li>• Instructions: Use AI tools to generate comparative analyses and formulate research questions.</li><li>• Compare and contrast VZV with other herpesviruses in terms of:<ul style="list-style-type: none"><li>Structural characteristics and genome organization</li><li>Cell tropism and tissue specificity</li><li>Latency mechanisms and reactivation patterns</li><li>Clinical manifestations in primary vs. recurrent infections</li></ul></li></ul> <p><b>Analyse differences between:</b></p> <ul style="list-style-type: none"><li>• Chicken pox vs. herpes zoster clinical presentations</li><li>• VZV transmission routes vs. other respiratory viruses</li><li>• Age-related susceptibility and disease severity patterns</li><li>• Immune responses in immunocompetent vs. immunocompromised hosts</li></ul> <p><b>Formulate hypotheses such as:</b></p> <ul style="list-style-type: none"><li>• "Why does VZV cause vesicular rash while other respiratory viruses don't?"</li><li>• "How does viral latency in dorsal root ganglia contribute to zoster development?"</li><li>• "What factors determine the severity of chickenpox in different age groups?"</li><li>• "Why is VZV more contagious than other herpesviruses?"</li></ul>
<p>Step 2</p> <p><b>Reflect and Visualize (Analyze AI Output)</b></p> <ul style="list-style-type: none"><li>• Instructions: Critically evaluate AI-generated content and create visual representations.</li></ul> <p><b>Critically assess AI outputs for:</b></p> <ul style="list-style-type: none"><li>• Accuracy of viral structure and morphology descriptions</li><li>• Completeness of pathogenesis mechanisms</li><li>• Current vaccination efficacy data</li><li>• Reliability of epidemiological trends</li></ul> <p><b>Create data visualizations to illustrate:</b></p> <ul style="list-style-type: none"><li>• Comparative herpesvirus family characteristics chart</li><li>• Age-specific incidence and complication rates</li><li>• Seasonal variation patterns in chicken pox outbreaks</li><li>• Vaccination coverage vs. disease incidence correlations</li><li>• Timeline of viral replication and symptom development</li></ul> <p><b>Identify patterns in:</b></p> <ul style="list-style-type: none"><li>• Pre- vs. post-vaccination era epidemiological changes</li><li>• Risk factors for severe complications</li><li>• Breakthrough infections in vaccinated populations</li><li>• Healthcare utilization patterns during outbreaks</li></ul>
<p>Step 3</p> <p><b>Apply Concepts &amp; Case Studies (Synthesize Learning)</b></p> <ul style="list-style-type: none"><li>• Instructions: Connect findings to established medical principles and real-world scenarios.</li></ul> <p><b>Cite relevant virological principles:</b></p> <ul style="list-style-type: none"><li>• DNA virus replication mechanisms and latency establishment</li><li>• Viral immune evasion strategies and antigenic properties</li><li>• Cell-mediated immunity importance in viral control</li><li>• Live attenuated vaccine principles and efficacy</li></ul> <p><b>Apply pathogenesis concepts:</b></p> <ul style="list-style-type: none"><li>• Respiratory tract entry and initial viral replication</li><li>• Viremic spread and skin lesion development</li><li>• Neurotropism and establishment of latency</li><li>• Inflammatory responses and vesicle formation mechanisms</li></ul> <p><b>Analyze case studies demonstrating:</b></p> <ul style="list-style-type: none"><li>• Outbreak management in school and healthcare settings</li><li>• Complications in immunocompromised patients</li><li>• Vaccine failure investigations and breakthrough cases</li></ul>
Creator: Ranjith Mehenderkar



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine (5)

Topic: Shigella Species
<p>Step 1</p> <p><b>Compare, Contrast and Hypothesize (Use Gen AI)</b></p> <ul style="list-style-type: none"><li>• Instructions: Use AI tools to generate comparative analyses and formulate research questions.</li><li>• Compare and contrast Shigella species (<i>S. dysenteriae</i>, <i>S. flexneri</i>, <i>S. boydii</i>, <i>S. sonnei</i>) in terms of:<ul style="list-style-type: none"><li>• Morphological and biochemical characteristics</li><li>• Virulence factors and toxin production</li><li>• Geographic distribution and epidemiological patterns</li><li>• Disease severity and clinical manifestations</li></ul></li></ul> <p><b>Analyse differences between:</b></p> <ul style="list-style-type: none"><li>• Shigella vs. other enteric pathogens (<i>E. coli</i>, Salmonella, Campylobacter)</li><li>• Invasive vs. non-invasive diarrheal mechanisms</li><li>• Shiga toxin effects in different patient populations</li></ul> <p><b>Formulate hypotheses such as:</b></p> <ul style="list-style-type: none"><li>• "Why does <i>S. dysenteriae</i> type 1 cause more severe epidemics than other species?"</li><li>• "How does the low infectious dose of Shigella contribute to transmission patterns?"</li><li>• "What factors determine antibiotic treatment success in bacillary dysentery?"</li><li>• "Why are children more susceptible to severe Shigella infections?"</li></ul>
<p>Step 2</p> <p><b>Reflect and Visualize (Analyze AI Output)</b></p> <ul style="list-style-type: none"><li>• Instructions: Critically evaluate AI-generated content and create visual representations.</li></ul> <p><b>Critically assess AI outputs for:</b></p> <ul style="list-style-type: none"><li>• Accuracy of morphological and biochemical descriptions</li><li>• Completeness of pathogenesis mechanisms</li><li>• Current antibiotic resistance data</li></ul> <p><b>Create data visualizations to illustrate:</b></p> <ul style="list-style-type: none"><li>• Comparative virulence factor profiles across species</li><li>• Global distribution maps showing endemic regions</li><li>• Antibiotic resistance trends over time</li><li>• Diagnostic test sensitivity and specificity comparisons</li></ul> <p><b>Identify patterns in:</b></p> <ul style="list-style-type: none"><li>• Seasonal variation of bacillary dysentery cases</li><li>• Transmission routes in different socioeconomic settings</li><li>• Laboratory diagnostic yield variations</li></ul>
<p>Step 3</p> <p><b>Apply Concepts and Case Studies (Synthesize Learning)</b></p> <ul style="list-style-type: none"><li>• Instructions: Connect findings to established medical principles and real-world scenarios.</li></ul> <p><b>Cite relevant microbiological principles:</b></p> <ul style="list-style-type: none"><li>• Bacterial invasion and intracellular survival mechanisms</li><li>• Shiga toxin structure-function relationships</li><li>• Host inflammatory responses and tissue damage</li><li>• Selective media and biochemical identification methods</li></ul> <p><b>Apply pathogenesis concepts:</b></p> <ul style="list-style-type: none"><li>• Intestinal epithelial cell invasion process</li><li>• Inflammatory cascade and neutrophil recruitment</li><li>• Hemolytic uremic syndrome (HUS) development</li><li>• Electrolyte and fluid loss mechanisms</li></ul> <p><b>Analyze case studies demonstrating:</b></p> <ul style="list-style-type: none"><li>• Outbreak investigations in institutional settings</li><li>• Differential diagnosis challenges in bloody diarrhea</li><li>• Antibiotic resistance issues</li><li>• Infection control measures</li></ul>
Creator: Ranjith Mehenderkar



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Pharmacy

Topic: Beta Blockers and Calcium Channel Blockers	Topic: HAP vs CAP Antibiotics
Step 1 <ul style="list-style-type: none"><li>Students compare and contrast the side effects of beta blockers and calcium channel blockers using Gen AI.</li></ul>	Step 1 <ul style="list-style-type: none"><li>Students to compare the Hospital Acquired Pneumonia treatment and Community Acquired Pneumonia treatment in antibiotic selection.</li></ul>
Step 2 <ul style="list-style-type: none"><li>Students write their reflection on the similarities and differences as compared to the data provided by Gen AI.</li></ul>	Step 2 <ul style="list-style-type: none"><li>Students critically review the Gen AI-generated comparison, then re-run the query using Malaysia's Clinical Practice Guidelines (CPG) as the primary reference. They identify differences, highlight inconsistencies, and visualise the variations in antibiotic choices.</li></ul>
Step 3 <ul style="list-style-type: none"><li>Students must cite a case study which is the most appropriate medicine with patient having hypertension and asthma.</li></ul>	Step 3 <ul style="list-style-type: none"><li>Students discuss and contrast the "before" (initial Gen AI output) and "after" (CPG-based output) versions, citing relevant pharmacology principles, antimicrobial stewardship concepts, and real-world case examples to justify which recommendations are more appropriate in a Malaysian clinical context.</li></ul>
Creator: Syed Atif Abbas	Creator: Tan Boon Seng



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (1)

Topic: Early Childhood Play Issues	Topic: Psychological Effects in Chronic Illnesses
<p>Step 1</p> <ul style="list-style-type: none"><li>Students are required to search on one child's development issue regarding play in early childhood and compare with one country that has the same issue.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>Students generate a comparison between the psychological effects of chronic illnesses such as diabetes and cancer, focusing on emotional well-being, coping strategies, and quality of life.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students reflect on their prior knowledge in Play in ECE and identify what are the best methods to solve the issue.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>Lecturer asks what input can be included for a more accurate analysis.</li><li>Severity and duration of illness.</li><li>Cultural beliefs and stigma surrounding illness.</li><li>Availability of social and family support.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students use any Gen AI to refer to the method to ensure the methods used are applicable and align with the curriculum.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>Students apply relevant psychological concepts/ principles (e.g., Health Belief Model, Stress and Coping Theory) to assess Gen AI's output.</li><li>Students refer to research articles or health psychology reports to verify accuracy of the inferred psychological impacts.</li></ul>
Creator: Aida Diyana Nabila Abdul Rahman	Creator: Muthualagan Thangavelu



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (2)

Topic: International Communication	Topic: Skimming vs Scanning
<p>Step 1</p> <ul style="list-style-type: none"> <li>Students critically analyse the role of media imperialism in shaping international communication between Western and Eastern countries.</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Students generate a comparison between skimming and scanning in terms of their effectiveness and application in ESL academic reading.</li> </ul>
<p>Step 2</p> <p>Using Gen AI to generate initial insights, students:</p> <ul style="list-style-type: none"> <li>Identify and critique underlying assumptions or biases in the AI output.</li> <li>Construct a mind map that visualises not just information flow, but ideological influence and power dynamics.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students assess skimming and scanning results for alignment with their own prior knowledge of the text and recent classroom reading activities. <ul style="list-style-type: none"> <li><input type="checkbox"/> Lecturer asks what input can be included for a more accurate analysis.</li> <li><input type="checkbox"/> Text complexity and length</li> <li><input type="checkbox"/> Reader's familiarity with the topic</li> <li><input type="checkbox"/> Time allocated for the reading task</li> </ul> </li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Students analyse multiple sources (AI, academic texts, media examples) to deconstruct arguments and infer logical structures.</li> <li>Students apply relevant theories to evaluate the credibility and implications of the AI-generated content.</li> <li>Reflect on how this process challenges or reshapes their understanding of global communication.</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Students apply relevant reading concepts/ principles to assess the effectiveness of skimming and scanning in understanding an academic text.</li> </ul>
Creator: Nabillah Rafidah Abdul Kadir	Creator: Pavinder Kaur Girn Baldev Singh



## APPENDIX 4A - ANALYSE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (3)

Topic: ECE Research Design and Validity Threats	Topic: Synchronous and Asynchronous Learning
<p>Step 1</p> <ul style="list-style-type: none"> <li>Students use AI to analyse validity threats and compare actual vs. ideal methodological choices.</li> </ul> <p><b>Actual Choices and why they are problematic:</b></p> <ul style="list-style-type: none"> <li>❑ Sampling: 4 teachers from the researcher's daughter's school (convenience + bias)</li> <li>❑ Data collection: Pickup time interviews (rushed, public setting)</li> <li>❑ Question focus: Only "successful" strategies (ignores challenges/failures)</li> <li>❑ Analysis framework: Popular parenting website categories (non-academic)</li> </ul> <p><b>AI Prompt:</b> "Analyse this toilet training research design for validity threats. Compare the researcher's methodological choices with best practices for trustworthiness in ECE research. What problematic assumptions about data collection and analysis exist?"</p>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Students are instructed to generate differences between synchronous and asynchronous learning in e-learning ecologies.</li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Students reflect on AI's validity analysis and create a table ranking the issues in terms of severity and provide a justification for their ranking.</li> </ul> <p><b>Expected Mapping:</b></p> <ul style="list-style-type: none"> <li>❑ Sampling bias → Investigator triangulation (multiple researchers)</li> <li>❑ Rushed interviews → Method triangulation (observations + interviews)</li> <li>❑ Success-only focus → Member checking with teachers for balanced perspectives</li> <li>❑ Non-academic framework → Theory triangulation using developmental theories</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students assess the learning strategies that can be integrated into each learning, and create a mind map like Napkin AI to visualize their findings.</li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Students apply specific enhancement strategies from course content to address the identified weaknesses.</li> </ul> <p><b>Key Strategies to Prioritise:</b></p> <ul style="list-style-type: none"> <li>❑ Reflexivity (acknowledge researcher's parent role)</li> <li>❑ Longer data collection period (beyond pickup rush)</li> <li>❑ Negative case sampling (include challenging cases)</li> <li>❑ Peer review (external validation of findings)</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Student use any Gen AI tools to support the evidence based on the previous study and possibly link to relevant theories (e.g: Social Constructivism).</li> </ul>
Creator: Ranjit Singh Gill	Creator: Ruuhina Mohd Sani



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (1)

Topic: Statistical Analysis for Product Launch	Topic: Innovations and Challenges in Modern Cuisine
<p>Step 1</p> <ul style="list-style-type: none"> <li>Students work in groups (5-6 members per group) to evaluate market research data collected for a company preparing to launch a new product.</li> <li>Each group uploads the dataset into a generative AI tool to summarise and analyse the findings.</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Students prompt Gen AI to compile and summarise data on modern cuisine methods, ingredient innovations, or presentation trends.</li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Students must then cross-reference and verify the AI-generated output by conducting statistical analyses using tools such as SPSS (e.g., descriptive statistics, t-tests, correlation, regression). This verification process should highlight any discrepancies, validate key findings, and ensure the robustness of the insights.</li> <li>Based on the combined AI and statistical analysis, students produce a written diagnosis that identifies key insights, the root causes of any issues, and the implications for the product launch.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students fact-check AI information against credible culinary research, professional chef interviews, or case studies.</li> <li>They then write a diagnosis identifying <b>key insights</b>, <b>root causes</b> of any issues, and/or <b>potential implications</b> for the modern cuisine context.</li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Students then propose a comprehensive action plan for the company, clearly outlining the steps to be taken.</li> <li>As part of the exercise, students must develop their own criteria for evaluating the AI output and statistical results (e.g., accuracy, relevance, clarity, statistical significance, and practical feasibility).</li> <li>These criteria should be explicitly stated in the report and explained during presentation, and applied when making judgments.</li> <li>Students must also defend their reasoning against counterarguments by considering alternative interpretations or approaches and providing evidence-based rebuttals.</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Students develop an actionable plan for improving or innovating within a modern cuisine dish, menu, or service style.</li> </ul>
<p>Step 4</p> <ul style="list-style-type: none"> <li>The plan must be justified with evidence from the AI output, SPSS results, students' own interpretations, and concepts from relevant lecture materials.</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>Students defend their decision-making process using their own insights, lecture notes, and culinary principles relevant to modern cuisine.</li> </ul>
Creator: Aervina Misron	Creator: Noor Asneda Ishak



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (2)

Topic: Working Capital and Investment Decisions
<p>Step 1</p> <p>Data Analysis in Working Capital and Investment Decisions Using Generative AI</p> <ul style="list-style-type: none"><li>Students summarise and analyse relevant financial data/information (e.g., liquidity ratios, cash conversion cycle, project NPV/IRR) using Gen AI tools to extract patterns, trends, and preliminary insights.</li></ul>
<p>Step 2</p> <p>Validation and Diagnostic Assessment of AI-Generated Financial Insights</p> <ul style="list-style-type: none"><li>Students cross-reference AI output with reliable financial data sources, academic literature, and lecture materials to verify accuracy.</li><li>Analyse the situation by identifying key insights, determine root causes of issues, and evaluate the potential implications for working capital or investment projects.</li></ul>
<p>Step 3</p> <p>Action Plan for Optimising Working Capital and Evaluating Investments</p> <ul style="list-style-type: none"><li>Students develop a structured plan of action.</li><li>Ways to improve cash flow efficiency, inventory control, receivables/ payables management, or making capital investment recommendations.</li><li>Based on their validated analysis.</li></ul>
<p>Step 4</p> <p>Justification of Financial Decisions Based on Evidence and Theory</p> <ul style="list-style-type: none"><li>Students present and defend their proposed actions.</li><li>Provide clear justifications grounded in their own insights, verified findings, and relevant financial management frameworks taught in the course (e.g., risk-return trade-off, time value of money, capital budgeting principles).</li></ul>
Creator: Chen Yuen Nee



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (3)

Topic: Participative Management in Organisations	Topic: Optimising Restaurant Supply
<p>Step 1</p> <p>Students:</p> <ul style="list-style-type: none"><li>• Use NotebookLM to understand Ricardo Semler's idea of participative management by inserting link into Perplexity: <a href="https://www.strategy-business.com/article/05408">https://www.strategy-business.com/article/05408</a></li><li>• Use the chat function to deep dive into Ricardo Semler's ideas.</li><li>• Use the audio overview to hear about SEMCO examples of participative management in practice.</li><li>• Use the mind map function to get an overview of the article.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are given data of the monthly food sales and production of a hypothetical restaurant.</li><li>• Using Gen AI, they summarise data that reflect the restaurant's demand and supply situation.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students use Perplexity to ask if participative management, as per Ricardo Semler, is suitable to be embedded in the following organisations: large MNCs, MSMEs, organisations in Asia, organisations in western cultures, different management/leadership styles.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Given the objective to optimise food production and minimise food wastage, students use Gen AI to diagnose data to highlight periods of overproduction when supply exceeds demand.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students use the responses to help evaluate if participative management will be suited for the current organisation they are working in.</li><li>• Students make a decision.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Students propose a food waste management plan that can optimise food production and minimise food waste.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students provide specific justifications for their decision by explaining the exact circumstances of their organisation.</li></ul>	<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain reasons for the suggested plan.</li></ul>
Creator: Jeffrey Yee Khong Loong	Creator: Ng Mei Ling



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (4)

Topic: Financial Analysis
<p>Step 1</p> <p>The company's financial statements for 2024 show:</p> <p>Income Statement:</p> <ul style="list-style-type: none"><li>• Revenue: RM 1,200,000;</li><li>• COGS: RM 720,000;</li><li>• Operating Expenses: RM 240,000;</li><li>• Interest Expense: RM 30,000;</li><li>• Tax Expense: RM 45,000.</li></ul> <p>Statement of Financial Position:</p> <ul style="list-style-type: none"><li>• Current Assets: RM 400,000;</li><li>• Inventory: RM 150,000;</li><li>• Current Liabilities: RM 200,000;</li><li>• Total Assets: RM 1,000,000;</li><li>• Total Liabilities: RM 500,000;</li><li>• Equity: RM 500,000.</li></ul> <p>Students input the information above into ChatGPT (or similar AI):</p> <ul style="list-style-type: none"><li>• Calculate and interpret the key financial ratios (gross profit margin, net profit margin, current ratio, quick ratio, return on assets, debt-to-equity ratio).</li><li>• Provide a summary evaluation of Alpha Manufacturing's financial performance and position.</li></ul>
<p>Step 2</p> <p>Students manually calculate all ratios from the given information above. The ratios include:</p> <ul style="list-style-type: none"><li>• Gross Profit Margin</li><li>• Net Profit Margin</li><li>• Current Ratio</li><li>• Quick Ratio</li><li>• Return on Assets (ROA)</li><li>• Debt-to-Equity Ratio</li></ul>
<p>Step 3</p> <p>Students write a 200–300-word diagnosis:</p> <ul style="list-style-type: none"><li>• Overall performance (profitability, liquidity, efficiency, solvency).</li><li>• Strengths and weaknesses of the company from the ratio.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students provide recommendations for improvement.</li><li>• Students show whether the AI's analysis supports or conflicts with their own, and why they chose their approach.</li></ul>
Creator: Nurul Atikah Kamaruddin



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (1)

Topic: Optimising Robot Logic Timing
<p>Step 1</p> <p><b>Diagnosing and Resolving Timing Errors in Sequential Logic Circuits for Robotic Control Systems</b></p> <p><b>Summarise / Analyse using Gen-AI</b></p> <p>Students feed timing diagrams, propagation delay data, or simulation logs into Gen-AI and request:</p> <ul style="list-style-type: none"><li>• Summary of possible timing issues (e.g., setup/hold violations, race conditions).</li><li>• Suggested potential causes and general industry remedies.</li></ul>
<p>Step 2</p> <p><b>Cross-Reference and Verify</b></p> <ul style="list-style-type: none"><li>• Students verify AI claims by checking against:<ul style="list-style-type: none"><li><input type="checkbox"/> Their own simulations in Quartus/Proteus/Logisim.</li><li><input type="checkbox"/> Datasheets and textbook timing specifications.</li></ul></li><li>• Students write a diagnosis report:<ul style="list-style-type: none"><li><input type="checkbox"/> Key insights (what's wrong and why).</li><li><input type="checkbox"/> Root cause (e.g., clock skew due to long routing delays).</li><li><input type="checkbox"/> Implications (e.g., possible actuator misalignment in the robotic arm).</li></ul></li></ul>
<p>Step 3</p> <p><b>Propose a Plan</b></p> <ul style="list-style-type: none"><li>• Students draft a corrective plan (e.g., redesign with synchronous clocking, reconfigure FSM states, reduce path delays).</li><li>• Consider practical constraints like cost, component availability, and power budget.</li></ul>
<p>Step 4</p> <p><b>Justification</b></p> <ul style="list-style-type: none"><li>• Students justify their chosen plan:<ul style="list-style-type: none"><li><input type="checkbox"/> Reference <b>own findings</b>, simulation data, and lecture concepts.</li><li><input type="checkbox"/> Show why it's more suitable than AI's initial recommendation if they differ.</li><li><input type="checkbox"/> Include trade-off analysis (e.g., increased speed vs. higher power draw).</li></ul></li></ul>
Creator: Mah Siew Kien



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (2)

Topic: Smart Packaging Design Selection
<p>Step 1</p> <ul style="list-style-type: none"><li>Students are given 2 alternative design concepts of smart packaging systems. You are required to select the most suitable concepts for the system which fulfil several criteria such as cost, control complexity, maintenance need, power efficiency, user friendly and safety by using generative AI tools.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students analyse the AI suggested criteria with at least 5 reliable and updated sources (technical datasheet, journal, textbook) by recording the relevance, assumption, strength and weaknesses of the proposed designs and the implications of selecting the poor design.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students develop the evaluation criteria based on verified information, assign the criterion weightage with justification and identify the most suitable design as the proposed plan using decision matrix.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students conclude with a clear course of action for implementing the most suitable design with justification using reliable reference(s), course material, datasheet, technical aspect from relevant engineering principles.</li></ul>
Creator: Norhidayah Binti Ahmad



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (3)

Topic: Usability Diagnosis and UI Redesign
<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides the data (AI with usability testing data) for a specific website, including:<ul style="list-style-type: none"><li>❑ Task completion times</li><li>❑ Error frequency</li><li>❑ User satisfaction survey results (e.g., SUS scores)</li><li>❑ Screen recordings or clickstream data</li></ul></li><li>• Students use Gen AI to summarise findings, highlighting key usability strengths, weaknesses, and user pain points.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students examine AI's output and cross-check against raw usability data and HCI guidelines (e.g., Nielsen's heuristics, WCAG standards).</li><li>• Students identify any other critical information needed for a more accurate diagnosis, such as:<ul style="list-style-type: none"><li>❑ Demographic details of test participants</li><li>❑ Device/browser performance data</li><li>❑ Accessibility audit results.</li></ul></li><li>• OR lecturer provides additional relevant information affecting the diagnosis. (Depends on student's level).</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students propose a targeted UI improvement plan, such as:<ul style="list-style-type: none"><li>❑ Redesigning navigation flow for clarity</li><li>❑ Enhancing visual hierarchy for better readability</li><li>❑ Adding accessibility features (e.g., colour contrast, keyboard shortcuts)</li><li>❑ Optimising page load times on mobile devices</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain the reasons for proposed changes, citing:<ul style="list-style-type: none"><li>❑ HCI principles and usability heuristics</li><li>❑ Findings from the usability test data</li><li>❑ Relevant case studies or industry best practices</li></ul></li><li>• Students describe expected improvements in user engagement, satisfaction, and task efficiency.</li></ul>
Creator: Nur Syaheera Sulaiman



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (1)

Topic: CRISPR Gene Editing Design and Evaluation
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are provided with a <b>real-world genetic problem</b> (e.g., developing drought-tolerant rice, correcting a human genetic disorder, or engineering yeast for higher ethanol yield).</li><li>• Use CRISPR-Cas9 to perform gene editing. Students use AI tools to find the information</li><li>• Students use <b>AI bioinformatics tool</b> (e.g., Benchling AI, CRISPR RGEN Tools, or ChatGPT with domain-specific prompting) to<ul style="list-style-type: none"><li><input type="checkbox"/> Generate possible guide RNA sequences</li><li><input type="checkbox"/> Predict off-target sites</li><li><input type="checkbox"/> Simulate gene edits</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students <b>compare AI-generated suggestions</b> with literature-based manual designs and published research data.</li><li>• Students read <b>peer-reviewed research articles</b> where similar edits have been performed<ul style="list-style-type: none"><li><input type="checkbox"/> Looking at <b>established design rules</b> (e.g., GC content, minimal off-targets, proximity to mutation site)</li><li><input type="checkbox"/> Checking genome browsers and databases (NCBI, Ensembl)</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students choose <b>ONE main design strategy</b> (can incorporate elements from both AI and literature), and</li><li>• Justify their choice based on:<ul style="list-style-type: none"><li><input type="checkbox"/> Experimental feasibility</li><li><input type="checkbox"/> Predicted performance</li><li><input type="checkbox"/> Risk vs benefit</li><li><input type="checkbox"/> Resource constraints</li><li><input type="checkbox"/> Ethical/regulatory acceptability</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students <b>critically justify</b> the most suitable approach considering efficiency, specificity, ethical implications, scalability, and regulatory aspects.</li></ul>
Creator: Kamariah Hasan



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (2)

Topic: Strengthening Environmental NGO Impact
<p>Step 1</p> <ul style="list-style-type: none"><li>Students are required to discuss and criticise the roles of environmental organizations from both developed and developing countries in addressing environmental issues.</li></ul> <p>Lecturer gives examples:</p> <p>Developed Country: Greenpeace (Netherlands):</p> <ul style="list-style-type: none"><li>An international environmental NGO advocating for climate action, biodiversity protection, and reduction of pollution through global campaigns and policy influence.</li></ul> <p>Developing Country: Centre for Science and Environment (CSE, India):</p> <ul style="list-style-type: none"><li>Public interest research and advocacy organization focusing on sustainable development, air and water pollution control, and environmental policy reforms in India and South Asia.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students cross-reference and verify Gen AI output on these organizations, then enrich the analysis by adding key insights, identifying the root causes of the issues addressed, and discussing the broader implications of each organization's approach by using visual presentation using Napkin AI.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students propose a strategic plan or set of recommendations to improve the effectiveness of these organizations in resolving environmental challenges.</li><li>Students write a brief proposal report.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students explain how their proposed plan would enhance the roles and impact of these NGOs in addressing environmental issues.</li></ul>
Creator: Siti Nor Aishah Mohd Salleh



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (3)

Topic: Phylogenetic Analysis
<p>Step 1</p> <ul style="list-style-type: none"><li>Lecturer provides different phylogenetic trees built using various alignment methods (maximum likelihood, neighbour joining) and different types of sequences (nucleotide or protein).</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students examine the tree outputs and write a preliminary inference. Students identify if there are any other sequences missing for accurate inference of evolutionary relationships</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students propose the best tree building method, gene and type of sequences</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students explain the reason for the specific change made to the initial tree built.</li></ul>
Creator: Wendy Liu Ying Ying



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine

Topic: Clinical Diagnosis	Topic: Septic Shock Fluid Therapy
<p>Step 1</p> <ul style="list-style-type: none"> <li>Students perform the blood test using the bioanalyser</li> <li>Students analyse the output using at least TWO (2) appropriate Gen AI tool</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Students prompt Gen AI: "Evaluate the benefits and risks of using isotonic saline vs. balanced crystalloids (e.g., Ringer's lactate) in fluid resuscitation for septic shock."</li> <li>They then formulate a hypothesis, e.g., "Balanced crystalloids are associated with reduced incidence of hyperchloremic metabolic acidosis compared to isotonic saline in septic shock patients."</li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Actual diagnosis is provided, students need to: <ul style="list-style-type: none"> <li>Evaluate the outputs generated by the AI tools with clinician diagnosis</li> <li>Conclude the most precise diagnosis</li> </ul> </li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students critique the AI's reasoning by comparing it with evidence from major trials (e.g., SMART and SALT-ED studies). They create a comparative bar chart of outcomes such as mortality, length of ICU stay, and incidence of metabolic acidosis for each fluid type.</li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Students suggest a therapeutic and management plan based on the diagnosis</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Students reference fluid physiology concepts (e.g., chloride load and its renal impact) and real-world trial data. They then propose a management plan for septic shock fluid resuscitation that specifies: choice of fluid, dosing strategy, monitoring parameters (e.g., urine output, serum electrolytes), and adjustments for special populations (renal failure, pediatrics). Their plan must be justified with evidence and clinical reasoning.</li> </ul>
<p>Step 4</p> <ul style="list-style-type: none"> <li>Students write a reflective report on the comparison of AI generated and clinician diagnosis</li> <li>Students justify the suggested therapeutic and management plan</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>Students justify their choices using their own analysis, lecture notes, and independent reasoning, explaining why their plan is safe, evidence-based, and suited to the patient scenario.</li> </ul>
<p>Creator: Annie Poh Woon Cheng</p>	<p>Creator: Darryl Ong Khang Wei</p>



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Pharmacy

Topic: Hypertension Management	Topic: Paediatric Diarrhea Care
<p>Step 1</p> <ul style="list-style-type: none"><li>A patient is on atenolol for a week but the blood pressure is not controlled. Students need to analyse the blood pressure levels and the dose of atenolol using the Gen AI.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>Lecturer provides medical records of a paediatric patient with acute diarrhea, including history of present illness, dietary history, growth chart, stool examination results, and hydration status. Students use Gen AI to summarise findings and identify potential causes.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students need to give the reason why this medicine is not working for this patient.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>Students compare Gen AI's suggested diagnosis with WHO and Malaysian Paediatric Protocols. They evaluate the appropriateness of the AI's interpretation, identify missing critical information (e.g., exposure history, immunization status), and refine the diagnosis.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students have to propose the new medicine management plan by changing to another medicine.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>Students draft an evidence-based management plan, including oral rehydration therapy regimen, dietary modifications, and indications for antibiotics.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students give justification of the use of new medicine with proper dose.</li></ul>	<p>Step 4</p> <ul style="list-style-type: none"><li>Students justify their plan by evaluating the quality of evidence, clinical guidelines, and the patient's individual context.</li></ul>
Creator: Syed Atif Abbas	Creator: Tan Boon Seng



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (1)

Topic: Child Nutrition Planning	Topic: Event Management
<p>Step 1</p> <ul style="list-style-type: none"> <li>Lecturer provides a complete menu for children in kindergarten center that is generated by Gen AI.</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Lecturer provides details of a past large-scale campus event:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Event proposal</li> <li><input type="checkbox"/> Budget breakdown</li> <li><input type="checkbox"/> Marketing plan</li> <li><input type="checkbox"/> Logistics schedule</li> <li><input type="checkbox"/> Feedback forms from participants</li> </ul> </li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Students evaluate the menu and identify if the menu is appropriate and follow the balance diet and nutrition chart.</li> <li>Students identify the impact of serving the menu to the children.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students examine Gen AI's summary and write a reflection on the strengths and weaknesses of each stage of the event</li> <li>Students identify additional critical information needed to better understand the event's success or shortcomings, <b>OR</b> lecturer provides further relevant details (e.g., unexpected issues, last-minute changes) that impacted the event outcome.</li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Students propose a new healthy and complete menu plan for the children.</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Students propose an improved plan for organising a similar event, addressing the identified gaps in the earlier event stages.</li> </ul>
<p>Step 4</p> <ul style="list-style-type: none"> <li>Students explain the reason for the selection of the menu list in the plan that is appropriate for the children.</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>Students explain the reasons for changes or enhancements made to the proposed plan, linking them to lessons learned from the past event and concepts taught in class.</li> </ul>
<p>Creator: Aida Diyana Nabila Abdul Rahman</p>	<p>Creator: Muthualagan Thangavelu</p>



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (2)

Topic: Global Communication
Step 1 <ul style="list-style-type: none"><li>Students critically evaluate key theoretical frameworks in global communication by analysing their relevance, strengths, and limitations across diverse cultural, political, and media contexts.</li></ul>
Step 2 <ul style="list-style-type: none"><li>Assessment will require the application of these theories to real-world case studies, comparative analyses, or reflective essays that demonstrate depth of understanding and analytical rigor.</li></ul>
Step 3 <ul style="list-style-type: none"><li>Students must propose a strategic communication plan that applies the most relevant theoretical framework to a defined global context.</li></ul>
Step 4 <ul style="list-style-type: none"><li>As part of the assessment, students will develop their own criteria for evaluating the effectiveness of the selected framework, defend their reasoning against potential counterarguments, and provide clear justification for the proposed actions based on insights, findings, and lecture content.</li></ul>
Creator: Nabillah Rafidah Abdul Kadir



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (3)

Topic: Different Reading Strategies Across Multiple Text Types
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students summarise/analyse data/information from multiple text types<ul style="list-style-type: none"><li><input type="checkbox"/> News articles</li><li><input type="checkbox"/> Academic abstracts</li><li><input type="checkbox"/> Statistical tables</li><li><input type="checkbox"/> Infographics</li></ul></li></ul> <p>Sample</p> <ul style="list-style-type: none"><li>• Lecturer provides a mixed set of reading materials on the same topic:<ul style="list-style-type: none"><li><input type="checkbox"/> Newspaper feature</li><li><input type="checkbox"/> Peer-reviewed journal excerpt</li><li><input type="checkbox"/> Data chart from a government report</li><li><input type="checkbox"/> Visual infographic</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students examine their reading strategy results (e.g., predicting and inferring) and write a preliminary evaluation (e.g., key insights on comprehension level, reasons for strengths or weaknesses, and/or implications for reading improvement)</li><li>• Students identify any other critical information required for a more accurate evaluation, OR lecturer provides additional relevant information that affects the evaluation<ul style="list-style-type: none"><li><input type="checkbox"/> Text difficulty level</li><li><input type="checkbox"/> Student's prior knowledge of the topic</li><li><input type="checkbox"/> Cultural context of the reading material</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students propose strategic plans for improving reading comprehension across multiple text types (e.g., news articles, academic abstracts, statistical tables, infographics), taking into account:<ul style="list-style-type: none"><li><input type="checkbox"/> New data from Gen AI output comparisons.</li><li><input type="checkbox"/> Additional insights from lecturer-provided materials.</li><li><input type="checkbox"/> Factors such as text difficulty, cultural context, and prior knowledge</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain the reason for specific changes made to initial evaluation</li><li>• Students explain the reason for specific changes made to their initial evaluation of reading strategy performance (e.g., predicting and inferring) based on:<ul style="list-style-type: none"><li><input type="checkbox"/> New insights from Gen AI output</li><li><input type="checkbox"/> Additional information from lecturer-provided materials.</li><li><input type="checkbox"/> Relevant concepts from lecture notes and course readings</li></ul></li></ul>
Creator: Pavinder Kaur Girm Baldev Singh



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (4)

Topic: ECE Research Studies
<p>Step 1</p> <ul style="list-style-type: none"><li>Students summarise/analyse both research studies using Gen AI.</li><li><b>AI Prompt:</b> <i>"Compare these two ECE research studies on challenging behaviours. Analyse their methodologies, data collection approaches, and validity strategies. Summarise the key differences in research quality and identify which study provides more trustworthy findings."</i></li></ul> <p><b>Student Task:</b></p> <ul style="list-style-type: none"><li>Document AI's comparative analysis and quality assessment of both studies.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students cross-reference AI output with validity criteria covered in the course and write a critique of each study credibility.</li></ul> <p><b>Scaffolding provided for this task:</b></p> <ul style="list-style-type: none"><li>Compare AI's assessment against the 8 validity enhancement methods from the course content</li><li>Check AI's evaluation against triangulation principles</li><li>Assess whether AI correctly identified researcher positionality issues</li></ul> <p><b>Critique to answer this question:</b></p> <ul style="list-style-type: none"><li>How would quality differences affect the usefulness of findings for ECE practitioners?</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students propose a research improvement plan for the weaker study.</li></ul> <p><b>Scaffolding:</b> Research improvement plan to cover:</p> <ul style="list-style-type: none"><li><input type="checkbox"/> Sampling Strategy</li><li><input type="checkbox"/> Data Collection</li><li><input type="checkbox"/> Validity Enhancement</li><li><input type="checkbox"/> Timeline</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students give justification for their improvement plan based on course concepts and their critique.</li></ul>
Creator: Ranjit Singh Gill



## APPENDIX 4B - EVALUATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (5)

Topic: E-Learning Design Using Multimedia Principles.
<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides AI generated summaries of the main e-learning principles by Mayer's multimedia principles.<ul style="list-style-type: none"><li><input type="checkbox"/> Multimedia principle</li><li><input type="checkbox"/> Contiguity principle</li><li><input type="checkbox"/> Modality principle</li><li><input type="checkbox"/> Redundancy principle</li><li><input type="checkbox"/> Coherence principle</li><li><input type="checkbox"/> Personalization principle</li><li><input type="checkbox"/> Segmenting principle</li><li><input type="checkbox"/> Voice principle</li><li><input type="checkbox"/> Pre-training principle</li></ul></li><li>• Students judge the completeness, accuracy, and relevance of the AI summary and highlight strengths and weaknesses.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students compare the AI-generated content with at least two authoritative academic sources or from the lecture notes.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students proposed a brief plan for an online learning module that applies at least three verified e-learning principles</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students justify the chosen design approach based on other alternative approaches and explain why they were not selected.</li></ul>
Creator: Ruuhina Mohd Sani



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (1)

Topic: Business Research Poster
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students create an initial draft of their poster using a generative AI tool such as ChatGPT, Gemini, or DALL·E. This draft must be based on the research data they have collected.</li><li>• Students follow the detailed poster criteria provided by the lecturer, which include the required sections, visual elements, formatting guidelines, and proper citation in APA style.</li><li>• Students save both the prompts they used and the AI-generated outputs, as these will be included in their submission.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students then critique the AI-generated draft either individually or in small groups. In their critique, students must examine the accuracy and relevance of the content, the integration of their data, the theoretical correctness in relation to business research principles, the clarity and appeal of the visuals, and the presence of any biases, missing information, or factual errors.</li><li>• Students write a short but detailed critique that explains what aspects of the poster are effective and what requires improvement.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students improve the poster by making it original, accurate, and conceptually strong. This stage requires students to integrate relevant course concepts, incorporate verified data visualisations such as charts from SPSS or Excel, and refine both the text and visual presentation to ensure academic quality.</li><li>• The final poster must demonstrate a deep understanding of the research topic and present a unique synthesis of the findings and theoretical concepts.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students write a justification report of 300–500 words explaining the changes they made to the AI-generated draft.</li><li>• In this report, students must describe the reasons for each major change, how the changes improved the accuracy, clarity, and originality of the poster, and how the final version integrates multiple business concepts to meet the evaluation criteria.</li></ul>
Creator: Aervina Mison



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (2)

Topic: Healthy Malaysian Fine Dining Menu
<p>Step 1</p> <ul style="list-style-type: none"><li>• Student design a three-course fine dining menu following Malaysian Cuisine theme, in line with Healthy Eating Campaign.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students identify gaps in flavour balance, seasonality, plating appeal, nutritional balance, or cultural appropriateness.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students modify recipes, plating designs, ingredient choices, or presentation format.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students provide culinary, nutritional, aesthetic, and sustainability reasoning for each change.</li></ul>
Creator: Noor Asneeda Ishak



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (3)

Topic: Personal Financial Planning	Topic: Business Model Canvas
<p>Step 1</p> <p>Guided Drafting of a Client-Specific Financial Plan Using Generative AI</p> <ul style="list-style-type: none"> <li>Lecturer provides clear, specific, and detailed client profile criteria (including goals, values, temperament, and risk tolerance) for students to create an initial draft financial plan using Gen AI tools.</li> </ul>	<p>Step 1</p> <p>In preselected groups of 3, students:</p> <ul style="list-style-type: none"> <li>Formulate a business model for the business that you have in mind.</li> <li>Prepare the business model in the form of a business model canvas (BMC)</li> <li>Complete the 9 interconnected building blocks of your BMC, with at least 3 points for each building block.</li> </ul>
<p>Step 2</p> <p>Critical Evaluation of AI-Generated Financial Plans</p> <ul style="list-style-type: none"> <li>Students critique the AI-generated draft individually or in groups, assessing accuracy, suitability, ethical compliance, and alignment with the client's stated objectives and constraints.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students repeat the above but this time, use Perplexity or Chat GPT to formulate the business model in the form of a business model canvas. Each 9 interconnected building blocks of should have at least 5 points.</li> </ul>
<p>Step 3</p> <p>Refinement and Personalisation of the Financial Plan</p> <ul style="list-style-type: none"> <li>Students revise and enhance the draft to improve clarity, accuracy, and client alignment.</li> <li>To ensure recommendations are realistic, actionable, and tailored to the client's risk profile and values.</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Students compare the points generated by generative A.I. with the points from the group.</li> <li>Students revise their BMC to incorporate the ideas discussed.</li> <li>Finalise 3 points for each building block.</li> </ul>
<p>Step 4</p> <p>Justification of Financial Planning Recommendations</p> <ul style="list-style-type: none"> <li>Students present and defend their final plan, providing clear justifications supported by evidence, professional judgment, and relevant financial planning frameworks, while demonstrating alignment with client objectives and ethical responsibilities.</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>Students present the difference in output and explain the group decision to adapt/adopt/retain the points for each building block by considering the indigeneity of the idea to setting/culture/geography.</li> </ul>
Creator: Chen Yuen Nee	Creator: Jeffrey Yee Khong Loong



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (4)

Topic: Restaurant Marketing Strategy
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are given data of the monthly food sales and production of a hypothetical restaurant. Using Gen AI, they summarise data that reflect the restaurant's demand and supply situation.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluate reasons for periods of low demand:<ul style="list-style-type: none"><li><input type="checkbox"/> Relevance of target market</li><li><input type="checkbox"/> Food and beverage appeal</li><li><input type="checkbox"/> Relevance of promotion campaigns</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students refine strategy<ul style="list-style-type: none"><li><input type="checkbox"/> Craft more engaging messaging</li><li><input type="checkbox"/> Identify niche platforms</li><li><input type="checkbox"/> Develop interactive campaign elements</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain changes made to the first draft based on key marketing concepts</li></ul>
Creator: Ng Mei Ling



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Business and Management (5)

Topic: Sole Proprietorship Accounting
<p>Step 1</p> <ul style="list-style-type: none"><li>• Students are given the following scenario: You have been appointed as the accounting officer for "EcoCraft Furniture," a newly established sole proprietorship. The owner provides you with the following May 2025 transactions:<ul style="list-style-type: none"><li><input type="checkbox"/> Investments</li><li><input type="checkbox"/> purchases on credit</li><li><input type="checkbox"/> cash sales</li><li><input type="checkbox"/> credit sales</li><li><input type="checkbox"/> Returns</li><li><input type="checkbox"/> utility payments</li><li><input type="checkbox"/> receipts from customers</li><li><input type="checkbox"/> owner's withdrawals</li><li><input type="checkbox"/> wage payments.</li></ul></li><li>• Using this information, create a complete set of accounting records—including <b>general journal entries, ledger accounts, trial balance, and final financial statements</b>—for the month, ensuring compliance with basic accounting principles.</li><li>• You may use a Generative AI tool to produce an initial draft of the records, which you must then review, verify, and refine before submission.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Accuracy Check<ul style="list-style-type: none"><li><input type="checkbox"/> Compare AI-generated journal entries, ledger postings, and trial balances against the original transaction list.</li><li><input type="checkbox"/> Identify missing, duplicated, or incorrectly classified transactions.</li><li><input type="checkbox"/> Ensure debit and credit rules are followed.</li></ul></li><li>• Compliance with principles<ul style="list-style-type: none"><li><input type="checkbox"/> Check if the classification of assets, liabilities, equity, income, and expenses follows standard practice.</li></ul></li><li>• Numerical Verification<ul style="list-style-type: none"><li><input type="checkbox"/> Recalculate totals in ledgers, trial balance, and financial statements to detect calculation errors.</li><li><input type="checkbox"/> Cross-check closing balances with opening balances and transaction effects.</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Correct errors</li><li>• Adjust any incorrect debit/credit postings</li><li>• Ensure all amounts and dates are included and accurate.</li><li>• Update ledger balances after corrections</li><li>• Ensure the trial balance totals match (Debit = Credit).</li><li>• Adjust financial statements accordingly.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Discuss changes made and why they improve accuracy and clarity.</li></ul>
Creator: Nurul Atikah Kamaruddin



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (1)

Topic: Fault-Tolerant Digital Control
<p>Step 1</p> <ul style="list-style-type: none"><li>• Designing a Fault-Tolerant Digital Control Circuit for an Autonomous Robotic Arm <b>Lecturer Provides Criteria</b></li><li>• <b>Example of criteria:</b><ul style="list-style-type: none"><li><input type="checkbox"/> The circuit must detect and correct single-bit errors in control signals.</li><li><input type="checkbox"/> Operate within a 5V, &lt;50 mA power limit.</li><li><input type="checkbox"/> Respond to input changes within 20 ns.</li><li><input type="checkbox"/> Output must drive a stepper motor driver without glitches.</li></ul></li><li>• Students use <b>Gen-AI</b> to produce:<ul style="list-style-type: none"><li><input type="checkbox"/> Initial <b>block diagram</b> and <b>logic design</b>.</li><li><input type="checkbox"/> Truth table or state diagram.</li><li><input type="checkbox"/> Basic timing requirements.</li></ul></li><li>• Students design new fault-tolerant:<ul style="list-style-type: none"><li><input type="checkbox"/> Initial <b>block diagram</b> and <b>logic design</b>.</li><li><input type="checkbox"/> Truth table or state diagram.</li><li><input type="checkbox"/> Basic timing requirements.</li></ul></li></ul>
<p>Step 2</p> <p><b>Students Critique the AI Draft</b></p> <ul style="list-style-type: none"><li>• Students assess AI's draft against:<ul style="list-style-type: none"><li><input type="checkbox"/> <b>Technical feasibility</b> (is it possible with given constraints?).</li><li><input type="checkbox"/> <b>Efficiency</b> (component count, speed, power).</li><li><input type="checkbox"/> <b>Reliability</b> (fault-tolerance, signal stability).</li></ul></li><li>• Can be done <b>individually</b> or in <b>small groups</b> with guided discussion.</li></ul>
<p>Step 3</p> <p><b>Students Improve the Draft</b></p> <ul style="list-style-type: none"><li>• Students refine design by:<ul style="list-style-type: none"><li><input type="checkbox"/> Reworking Boolean expressions for minimal gate usage.</li><li><input type="checkbox"/> Adding error detection/correction (parity, Hamming code, redundancy).</li><li><input type="checkbox"/> Adjusting for power/timing requirements.</li></ul></li><li>• Validate changes via <b>simulation software</b> (Logisim, Quartus, Proteus).</li></ul>
<p>Step 4</p> <p><b>Students Justify Their Actions</b></p> <ul style="list-style-type: none"><li>• Justify improvements based on:<ul style="list-style-type: none"><li><input type="checkbox"/> Technical reasoning from lecture notes.</li><li><input type="checkbox"/> Data from simulations.</li><li><input type="checkbox"/> Trade-offs considered (e.g., added redundancy vs. increased component count).</li></ul></li></ul>
Creator: Mah Siew Kien



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (2)

Topic: Rectifier Circuit Design with Filter
<p>Step 1</p> <ul style="list-style-type: none"><li>• In groups of not more than 3 person, students are required to design rectifier circuit with filter. Here are the detailed design criteria, including:<ul style="list-style-type: none"><li>❑ Type of rectifier (half-wave or full-wave, bridge)</li><li>❑ Load voltage is 5 V and current 2 mA</li><li>❑ Ripple voltage must less than 0.5 V</li><li>❑ Efficiency more than 75%</li></ul></li><li>• Students need to use Generative AI tools to create an initial draft design that includes:<ul style="list-style-type: none"><li>❑ Circuit diagram (schematic)</li><li>❑ Expected performance parameters</li><li>❑ Choice of filter type (capacitor filter, LC filter and etc) with justification</li><li>❑ Basic component selection</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluate the AI-generated design by identifying:<ul style="list-style-type: none"><li>❑ Technical feasibility issues</li><li>❑ Potential design flaws</li><li>❑ Assumptions made by the AI without sufficient justification</li><li>❑ Alternative approaches and possible improvements</li></ul></li><li>• Students cross-check AI output with reliable sources (lecture notes, textbooks, journal paper, datasheets).</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Based on the critique, students need to modify and improve the AI-generated design to create an original rectifier and filter solution that meets or exceeds all given criteria.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students submit a written justification as follows:<ul style="list-style-type: none"><li>❑ Why the final design is an improvement over the AI draft</li><li>❑ The reasoning behind chosen modifications</li><li>❑ How theoretical knowledge from lectures was applied</li><li>❑ Evidence from simulations or prototype testing supporting the final design</li></ul></li></ul>
Creator: Norhidayah Ahmad



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Computing and Engineering (3)

Topic: HCI – Website with Good UI
<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides criteria for students to prompt Gen AI to generate a low-fidelity website prototype, including:<ul style="list-style-type: none"><li>❑ Target user persona</li><li>❑ Core tasks and scenarios</li><li>❑ Device type (desktop, mobile, tablet)</li><li>❑ Accessibility requirements (e.g., WCAG compliance)</li><li>❑ Branding and style guidelines</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluate:<ul style="list-style-type: none"><li>❑ Usability and intuitiveness of navigation flow</li><li>❑ Visual hierarchy and readability</li><li>❑ Accessibility compliance (e.g., colour contrast, keyboard navigation)</li><li>❑ Alignment with user needs and persona</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students refine prototype by:<ul style="list-style-type: none"><li>❑ Reorganising content layout for clarity</li><li>❑ Enhancing visual hierarchy and consistency</li><li>❑ Adding accessibility features and responsive design elements</li><li>❑ Integrating micro-interactions for feedback and engagement</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain reasons for modifications using:<ul style="list-style-type: none"><li>❑ HCI principles and usability heuristics</li><li>❑ Findings from prior usability tests or peer reviews</li><li>❑ Case studies or industry best practices</li><li>❑ Students describe anticipated improvements in usability, user satisfaction, and task efficiency</li></ul></li></ul>
Creator: Nur Syaheera Sulaiman



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (1)

Topic: CRISPR-Cas9 Gene Knockout in <i>Helicobacter pylori</i>
<p>Step 1</p> <ul style="list-style-type: none"><li>• For the generation of gene knockout in <i>Helicobacter pylori</i>, a Gram-negative bacterium responsible for chronic gastritis, peptic ulcers, and is associated with gastric cancer. Student will perform gene knockout by disrupting the gene responsible for the pathogenicity of the bacteria using CRISPR-Cas9 techniques. Lecturer provides criteria such as:<ul style="list-style-type: none"><li><input type="checkbox"/> The function of the genes.</li><li><input type="checkbox"/> The sequence of the genes</li><li><input type="checkbox"/> Basic experimental process</li><li><input type="checkbox"/> Design the sequence of gRNA</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluate:<ul style="list-style-type: none"><li><input type="checkbox"/> The methods for gene knockout</li><li><input type="checkbox"/> The feasibility of the gRNA sequence provided by AI</li><li><input type="checkbox"/> If there will be off-target edits</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students refine the gene editing strategy by providing the<ul style="list-style-type: none"><li><input type="checkbox"/> Best gRNA sequence</li><li><input type="checkbox"/> Suitable delivery method</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain final method and why it is appropriate and will give high success rate in gene editing. Student also give justification why other method will not work well.</li></ul>
Creator: Kamariah Hasan



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (2)

Topic: Chemical Incident Analysis and Safety Management
<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides clear, specific, and detailed criteria for students to create an initial draft using Gen AI. For example, lecturer specifies:</li><li>• Type of incident: Chemical spill in a manufacturing plant</li><li>• Required details: timeline of events, possible hazards, affected populations, initial response measures</li><li>• Focus areas: root cause analysis, public health risks, regulatory compliance, safety recommendations</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students critique draft generated by AI (individually or in groups):<ul style="list-style-type: none"><li><input type="checkbox"/> Check accuracy of the incident details</li><li><input type="checkbox"/> Identify missing hazard assessments or safety procedures</li><li><input type="checkbox"/> Evaluate completeness of emergency response actions</li><li><input type="checkbox"/> Highlight gaps in addressing community health and environmental impacts</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students improve on the draft:<ul style="list-style-type: none"><li><input type="checkbox"/> Add more accurate or locally relevant case details from credible sources</li><li><input type="checkbox"/> Include detailed safety protocols, hazard controls, and public health protection measures</li><li><input type="checkbox"/> Suggest prevention strategies based on industry best practices and legislation</li><li><input type="checkbox"/> Incorporate risk communication strategies for stakeholders and the public</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students give justification/ reasons for action taken:<ul style="list-style-type: none"><li><input type="checkbox"/> Explain why changes were made to improve accuracy, completeness, and applicability</li><li><input type="checkbox"/> Link modifications to lecture notes, official safety standards, and public health guidelines</li><li><input type="checkbox"/> Justify recommendations in terms of reducing hazards, improving emergency preparedness, and protecting community health</li></ul></li></ul>
Creator: Siti Nor Aishah Mohd Salleh



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Integrated Life Sciences (3)

Topic: Phylogenetic Analysis of Evolutionary Relationships
<p>Step 1</p> <ul style="list-style-type: none"><li>• For evolutionary relationship study, lecturer provides criteria for students to generate the phylogenetic tree output:<ul style="list-style-type: none"><li><input type="checkbox"/> Type of tree building methods</li><li><input type="checkbox"/> Best model</li><li><input type="checkbox"/> Gene type</li><li><input type="checkbox"/> Type of sequence</li><li><input type="checkbox"/> Organisms/strains</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluates the best tree building methods, gene sequences and length, alignment methods and types of sequences added.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students readjust the sequences that are included or the tree building methods to obtain an accurate topology. Students integrate different parameters and show deep understanding on the factors that affect the output of the tree.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain the reasons for the specific changes made to the initial tree building methods and thus builds an original tree that is accurate by cross referencing available literature as well.</li></ul>
Creator: Wendy Liu Ying Ying



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Medicine

Topic: Biomedical Technology Design	Topic: Clinical Fluid Therapy Planning
<p>Step 1</p> <ul style="list-style-type: none"> <li>Students analyse the current challenges (e.g., Diagnosis kits, hospital acquired infections etc.) with proper citations.</li> <li>Students use at least TWO (2) Gen AI tools to create a model or application or tool using a modern biomedical technology (e.g., Biosensor, crispr, nanotechnology, 3D-bioprinting etc.) to address the challenges identified.</li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>Lecturer gives students a patient scenario (e.g., "A 65-year-old male, post-major abdominal surgery, develops hypovolemic hyponatremia; comorbidities: hypertension, mild CKD stage 3").</li> <li>Criteria for the AI prompt include: select appropriate IV fluid, determine dosing and administration rate, outline monitoring parameters, and identify potential complications. Students then use Gen AI to generate an initial fluid therapy plan.</li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Students compare the AI-generated models within the team members.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>Students review the AI-generated plan, checking for clinical accuracy, feasibility, and compliance with guidelines (e.g., NICE, WHO, or local protocols). They identify inaccuracies, omissions, or unsafe recommendations.</li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Based on the pros and cons, students modify the AI-generated model with customized features.</li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>Based on their critique, students revise the plan — adjusting fluid type, dosing strategy, monitoring frequency, and contingency measures. They ensure it addresses comorbidities (e.g., CKD) and aligns with pathophysiological principles learned in lectures.</li> </ul>
<p>Step 4</p> <ul style="list-style-type: none"> <li>Group presentation and Q&amp;A.</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>Students provide a written or oral justification for every change made, referencing their own insights, lecture notes, guideline recommendations, and relevant case studies. They explain why their revised plan is more clinically sound than the AI's original output.</li> </ul>
Creator: Annie Poh Woon Cheng	Creator: Darryl Ong Khang Wei



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Pharmacy

Topic: Medicine Management in Clinical Practice	Topic: Pediatric Asthma
<p>Step 1</p> <ul style="list-style-type: none"><li>• A patient is having hypertension and is on beta blockers and suddenly he has asthma attack create an initial medicine management plan using Gen AI.</li></ul>	<p>Step 1</p> <ul style="list-style-type: none"><li>• Lecturer provides criteria for students to generate a caregiver education material for newly diagnosed pediatric asthma, including:<ul style="list-style-type: none"><li><input type="checkbox"/> Age-appropriate language</li><li><input type="checkbox"/> Key disease information</li><li><input type="checkbox"/> Inhaler technique instruction</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students critique the medicine management plan generated by AI by group discussion.</li></ul>	<p>Step 2</p> <ul style="list-style-type: none"><li>• Students evaluate the AI-generated education plan for:<ul style="list-style-type: none"><li><input type="checkbox"/> Check on accuracy and adherence to current clinical guidelines</li><li><input type="checkbox"/> Clarity and completeness of instructions</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students come up with the improved and finalised medicine management plan.</li></ul>	<p>Step 3</p> <ul style="list-style-type: none"><li>• Students add relevant visual aids or diagrams</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students give the justification why some medicines have to be removed or need dose adjustment.</li></ul>	<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain their answers linking decisions to:<ul style="list-style-type: none"><li><input type="checkbox"/> Evidence-based practices</li><li><input type="checkbox"/> Patient-centered communication</li></ul></li></ul>
Creator: Syed Atif Abbas	Creator: Tan Boon Seng



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (1)

Topic: Storybook Design for Preschoolers	Topic: Stage Play Scriptwriting
<p>Step 1</p> <ul style="list-style-type: none"> <li>• Student are required to create a story book themed “Under the sea” that is appropriate for preschoolers</li> <li>• Students use Gen AI to identify the following elements:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Title of the book</li> <li><input type="checkbox"/> Moral values</li> <li><input type="checkbox"/> Character of the story</li> <li><input type="checkbox"/> Story line</li> </ul> </li> </ul>	<p>Step 1</p> <ul style="list-style-type: none"> <li>• For a stage play, lecturer provides criteria for students to generate an AI output:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Genre (e.g., drama, comedy, thriller)</li> <li><input type="checkbox"/> Main characters and roles</li> <li><input type="checkbox"/> Setting and time period</li> <li><input type="checkbox"/> Central conflict</li> </ul> </li> </ul>
<p>Step 2</p> <ul style="list-style-type: none"> <li>• Students to ensure the elements generated by AI are relevant and appropriate for preschoolers.</li> </ul>	<p>Step 2</p> <ul style="list-style-type: none"> <li>• In group the students are required to evaluate:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Dialogue flow and authenticity</li> <li><input type="checkbox"/> Character development and motivation</li> <li><input type="checkbox"/> Dramatic tension and pacing</li> </ul> </li> </ul>
<p>Step 3</p> <ul style="list-style-type: none"> <li>• Students compare and do amendments on the parts that cannot grab the children’s attention and are required to add the following to the storyline.               <ul style="list-style-type: none"> <li><input type="checkbox"/> Surprise ending</li> <li><input type="checkbox"/> Additional character</li> </ul> </li> </ul>	<p>Step 3</p> <ul style="list-style-type: none"> <li>• Students rewrite sections of the script:               <ul style="list-style-type: none"> <li><input type="checkbox"/> Enhance emotional depth in scenes</li> <li><input type="checkbox"/> Add original plot elements or twists</li> <li><input type="checkbox"/> Strengthen stage directions for performance</li> </ul> </li> </ul>
<p>Step 4</p> <ul style="list-style-type: none"> <li>• Students give justifications for the changes and their final choices of the storyline.</li> </ul>	<p>Step 4</p> <ul style="list-style-type: none"> <li>• Students explain the reasons for specific changes made to the initial script draft, linking them to the desired creative style and chosen literary genre.</li> </ul>
<p>Creator: Aida Diyana Nabila Abdul Rahman</p>	<p>Creator: Muthualagan Thangavelu</p>



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (2)

Topic: Media and Culture Globalisation
<p>Step 1</p> <ul style="list-style-type: none"><li>Students input Gen AI prompt below: <i>"Generate a critical analysis essay (1,000–1,500 words) on the role of media and culture in globalisation. Focus on how media platforms and cultural exchanges influence global interconnectedness, identity, and power dynamics. Use at least two relevant case studies—such as K-pop’s global rise, Netflix’s international content strategy, or the spread of Western beauty standards through social media. The analysis should include theoretical perspectives (e.g., cultural imperialism, hybridity, media convergence), highlight both positive and negative impacts, and conclude with reflections on future trends. Cite credible sources and maintain an academic tone."</i></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students critically evaluate the AI-generated draft produced from the given prompt, either individually or in groups. The critique must assess the accuracy, relevance, and depth of the content, including the use of theoretical perspectives, case study integration, and the balance of arguments. Students are expected to identify strengths, gaps, biases, and areas for improvement, and reflect on the ethical and academic implications of using Generative AI in scholarly writing.</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students revise and improve the AI-generated draft by incorporating their critique findings, enhancing the clarity, coherence, and analytical depth of the essay. Revisions must demonstrate stronger integration of theoretical frameworks, more nuanced use of case studies, and a balanced evaluation of media and cultural dynamics in globalisation. Students should refine the structure, academic tone, and citation accuracy, ensuring the final version reflects original thought, contextual sensitivity, and ethical use of AI-assisted content.</li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students provide a written justification for the revisions made to the AI-generated draft, explaining the rationale behind each major change. Justifications should reference their critique findings, highlight improvements in theoretical integration, case study relevance, argument clarity, and academic tone. Students must also reflect on how their actions enhanced the overall quality, originality, and contextual appropriateness of the analysis, demonstrating critical awareness of both content and process.</li></ul>
Creator: Nabillah Rafidah Abdul Kadir



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (3)

Topic: Writing a Lesson Plan
<p>Step 1</p> <ul style="list-style-type: none"><li>• For a lesson plan, lecturer provides criteria for students to generate an AI output<ul style="list-style-type: none"><li><input type="checkbox"/> Topic</li><li><input type="checkbox"/> Learning objectives</li><li><input type="checkbox"/> Target learners</li><li><input type="checkbox"/> Lesson stages</li><li><input type="checkbox"/> Assessment</li></ul></li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>• Students critique<ul style="list-style-type: none"><li><input type="checkbox"/> Clarity of objectives</li><li><input type="checkbox"/> Relevance of activities</li><li><input type="checkbox"/> Logical sequence</li><li><input type="checkbox"/> Effectiveness of assessment</li><li><input type="checkbox"/> Engagement level</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>• Students suggest improvements<ul style="list-style-type: none"><li><input type="checkbox"/> Clarify objectives</li><li><input type="checkbox"/> Add engaging activities</li><li><input type="checkbox"/> Reorder lesson sequence</li><li><input type="checkbox"/> Enhance assessment methods</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>• Students explain the reasons for specific changes made to lesson plan<ul style="list-style-type: none"><li><input type="checkbox"/> To align activities with objectives</li><li><input type="checkbox"/> To improve student engagement</li><li><input type="checkbox"/> To ensure logical flow of content</li><li><input type="checkbox"/> To enhance clarity of instructions</li><li><input type="checkbox"/> To make assessment more effective</li></ul></li></ul>
Creator: Pavinder Kaur Girn Baldev Singh



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (4)

Topic: Impact of Play-Based Learning on Preschoolers' Social-Emotional Skills
<p>Step 1</p> <ul style="list-style-type: none"><li>Lecturer provides clear, specific and detailed criteria for students to create an initial draft using Gen AI.</li></ul> <p><b>Example criteria:</b></p> <ul style="list-style-type: none"><li>Research Problem: Based on authentic ECE practice issue.</li><li>Research Question: Focused, researchable, appropriate for qualitative inquiry.</li><li>Methodology: Choose from case study, phenomenology, or grounded theory.</li><li>Sampling Strategy: Purposive, convenience, or snowball with rationale.</li></ul> <p><b>AI Prompt Template:</b> "Create a qualitative research proposal for early childhood education focusing on [student's chosen issue]. Include research question, methodology (phenomenology/case study/grounded theory), sampling strategy, data collection methods, and validity enhancement strategies. Make it realistic for a student researcher."</p>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students critique the draft generated by AI, either individually or in groups.</li></ul> <p><b>Critique Focus Areas:</b></p> <ul style="list-style-type: none"><li>Methodological Alignment: Does the chosen approach match the research question?</li><li>Feasibility: Is the proposal realistic for student researchers with limited time/resources?</li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students improve on the draft.</li></ul> <p><b>Possible Improvement Tasks:</b></p> <ul style="list-style-type: none"><li>Refine Research Question: Ensure it's appropriately focused and answerable.</li><li>Strengthen Methodology: Align all elements with the chosen qualitative approach.</li><li>Enhance Validity Plan: Add specific strategies addressing identified threats.</li></ul> <p><b>Student Output:</b> Revised research proposal incorporating course concepts and addressing AI's limitations.</p>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students give justification/reasons for the action taken.</li></ul> <p><b>Example of Aspects for Justification:</b></p> <ul style="list-style-type: none"><li>Methodological Choices: Explain why the chosen approach best fits the research question.</li><li>Validity Decisions: Justify which enhancement strategies are most critical and why.</li><li>Feasibility Modifications: Defend changes made to ensure realistic implementation.</li></ul>
Creator: Ranjit Singh Gill



## APPENDIX 4C - CREATE

### Examples of Gen AI Embedded HOTS Teaching-Learning Activities

#### Faculty of Social Sciences (5)

Topic: E-Learning Storyboard
<p>Step 1</p> <ul style="list-style-type: none"><li>Lecturer provides students with <b>clear, specific, and detailed criteria</b> for what an effective e-learning storyboard should include (e.g., learning objectives, content flow, media elements, interactivity, assessment points). Students can use Gen AI tool to generate an initial storyboard draft.</li></ul>
<p>Step 2</p> <ul style="list-style-type: none"><li>Students review and critique the Ai-generated storyboard based on:<ul style="list-style-type: none"><li><input type="checkbox"/> Well-structured content</li><li><input type="checkbox"/> Clear objectives</li><li><input type="checkbox"/> Appropriate use of media</li></ul></li></ul>
<p>Step 3</p> <ul style="list-style-type: none"><li>Students refine the design:<ul style="list-style-type: none"><li><input type="checkbox"/> Screen/slide number</li><li><input type="checkbox"/> Visual elements</li><li><input type="checkbox"/> Narration or text</li><li><input type="checkbox"/> Interactivity/quiz details</li><li><input type="checkbox"/> Technical/media notes</li></ul></li></ul>
<p>Step 4</p> <ul style="list-style-type: none"><li>Students explain the final choice of design based on relevant design concepts and why specific AI suggestions were kept, modified or discarded.</li></ul>
Creator: Ruuhina Mohd Sani



## APPENDIX 5A - ANALYSE

### Holistic Rubric to Assess Teaching-Learning Activities

This level assesses the extent to which the activity requires students to break down information into its component parts, identify relationships, and determine the underlying structure or purpose.

SCALE	CRITERIA
1 Poor	<p>The activity asks students to identify facts or recall information without requiring them to examine relationships or patterns.</p> <p>For example, students might list characteristics or define terms.</p>
2 Fair	<p>The activity prompts students to find similarities or differences between concepts or to categorize information.</p> <p>For example, students might complete a Venn diagram or sort objects into groups.</p>
3 Good	<p>The activity requires students to deconstruct a complex topic, examine evidence, and identify the causes or effects of a phenomenon.</p> <p>For example, students might analyse a primary source document to determine the author's point of view or analyse a scientific experiment to identify the variables.</p>
4 Excellent	<p>The activity requires students to critically examine a complex problem, identify underlying assumptions or biases, and infer the logical structure of an argument.</p> <p>For example, students might analyse multiple sources to construct a historical narrative or deconstruct a complex mathematical proof to understand its logical flow.</p>



## APPENDIX 5B - EVALUATE

### Holistic Rubric to Assess Teaching-Learning Activities

This level assesses the extent to which the activity requires students to make judgments about the value of ideas or materials based on criteria and standards.

SCALE	CRITERIA
1 Poor	The activity asks students to state a preference or a simple opinion without requiring them to provide justification or evidence. For example, students might state whether they liked a story or not.
2 Fair	The activity prompts students to support a given opinion or compare and contrast based on a few provided criteria. For example, students might justify a choice between two options or rank items based on a simple rubric.
3 Good	The activity requires students to assess the validity, credibility, or relevance of information using established criteria. For example, students might evaluate the strengths and weaknesses of an argument or judge the effectiveness of a solution to a problem.
4 Excellent	The activity requires students to develop their own criteria for making a judgment, defend their reasoning against counterarguments, and justify a course of action based on a thorough evaluation of all available evidence. For example, students might design a rubric to evaluate a product or write a legal brief to argue a specific position.



## APPENDIX 5C - CREATE

### Holistic Rubric to Assess Teaching-Learning Activities

This level assesses the extent to which the activity requires students to put elements together to form a new, coherent whole or to create an original product.

SCALE	CRITERIA
1 Poor	The activity asks students to reproduce a product or assemble parts following a step-by-step guide. For example, students might copy a diagram or follow a recipe
2 Fair	The activity prompts students to adapt a given model or combine existing ideas in a limited way. For example, students might write a new ending to a story or modify a pre-existing design.
3 Good	The activity requires students to design a new product, plan a procedure, or formulate a new solution to a problem. For example, students might create a presentation on a chosen topic or design a blueprint for a structure.
4 Excellent	The activity requires students to generate a novel and original product, theory, or solution that integrates multiple concepts and demonstrates deep understanding. For example, students might compose a piece of music, develop a new scientific hypothesis, or create an original theatrical production to convey a complex theme.



# APPENDIX 6A

## Gen AI in Assessment

### Practical Guide: Designing Gen AI-Integrated Assessments

The word format of this document can be accessed from the QIU Open Educational Resources (OER) Hub [here](#).



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### Practical Guide: Designing Gen AI-Integrated Assessments

Aspect		Descriptions
1	<b>Outcomes and Purpose of the Assessment</b>	<p>Align the assessment clearly with the intended Course Learning Outcome(s).</p> <p>Integrate Gen AI tool(s) meaningfully to support students in achieving the targeted outcome(s).</p> <p>Provide transparent information on how Gen AI tool(s) function within the assessment, including their role in supporting learning and influencing decision-making.</p>
2	<b>Cognitive Engagement</b>	<p>Promote higher-order thinking skills such as analysis, evaluation, and creation through GenAI-integrated tasks.</p> <p>Encourage critical engagement with content and meaningful interaction with Gen AI tool(s).</p>
3	<b>Feedback and Support Mechanisms</b>	<p>Integrate Gen AI tools that provide personalised, real-time feedback (e.g., intelligent writing assistants, adaptive platforms).</p> <p>Embed feedback loops within the assessment process to guide students' progress and support iterative learning.</p>
4	<b>Ethical Consideration</b>	<p>Provide clear guidelines on the ethical use of Gen AI in assessments.</p> <p>Include expectations for:</p> <ul style="list-style-type: none"> <li>● Acknowledging GenAI support in student submissions</li> <li>● Avoiding plagiarism and over-reliance on AI tools</li> <li>● Citing AI-generated content where appropriate</li> </ul>
5	<b>Reflection and Metacognition</b>	<p>Use reflection to promote self-awareness, responsible use of AI, and deeper learning. Include opportunities for students to reflect on their use of Gen AI.</p>



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## APPENDIX 6B

### Gen AI in Assessment

#### [Samples] Outline for Gen AI-Integrated Assessment Task

The word format of this document can be accessed from the QIU Open Educational Resources (OER) Hub [here](#).



### [SAMPLES] Outline for Gen AI-Integrated Assessment Task

#### SAMPLE 1: Business & Management

<b>Course Lecturer</b>	Prof Dr XXX
<b>Programme</b>	BBA
<b>Course Code &amp; Course Name</b>	BXX1234 Business Communication and Strategy
<b>Course Learning Outcome(s)</b>	Critically evaluate business reports using relevant management principles for improvement. (C5)
<b>Assessment Task &amp; weightage</b>	AI-Powered Strategic Business Report Analysis & Enhancement (30%)
<b>Assessment Type</b>	Business Report Analysis (Individual)
<b>Summary of Task</b>	Students will be given a Gen AI-generated strategic business report on a fictional company's market expansion strategy. They will need to critically evaluate the report's content, structure, assumptions, and limitations, then use Gen AI tools to revise and enhance the report based on their critique.
<b>Instructions to Students</b>	<p>You are to act as a business consultant reviewing an AI-generated strategy document.</p> <ul style="list-style-type: none"><li>● Identify strengths, flaws, and areas for improvement (600–800 words).</li><li>● Use Gen AI tools (e.g. ChatGPT) to revise and improve the report.</li><li>● Write a reflection (400–500 words) on Gen AI's role and ethical issues.</li><li>● Complete peer feedback using a rubric that includes ethical use of AI.</li></ul>
<b>Gen AI Tool(s) Required</b>	ChatGPT, Grammarly, Quillbot
<b>Rubric Criteria</b>	<ul style="list-style-type: none"><li>● Depth of critique (25%)</li><li>● Justification and quality of enhancements (25%)</li><li>● Ethical and critical reflection on Gen AI use (25%)</li><li>● Originality and clarity (15%)</li><li>● Peer feedback quality (10%)</li></ul>



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## Outline for Gen AI-Integrated Assessment Task

### SAMPLE 2: Education

<b>Course Lecturer</b>	Prof Dr XXX
<b>Programme</b>	Bachelor of Education
<b>Course Code &amp; Course Name</b>	Bxx3113 Curriculum and Instructional Design
<b>Course Learning Outcome(s)</b>	Develop a lesson plan that supports learner autonomy and metacognition. (C6)
<b>Assessment Task &amp; weightage</b>	Designing a Gen AI-Supported Lesson Plan to Foster Learner Autonomy and Metacognition (30%)
<b>Assessment Type</b>	Lesson Plan Design + Reflection (Individual)
<b>Summary of Task</b>	Students are required to design a lesson plan for a topic of their choice (based on the teaching specialisation) that integrates the use of Generative AI tools to support learner autonomy and metacognitive development.
<b>Instructions to Students</b>	<ol style="list-style-type: none"> <li>1. Identify a specific topic and learning outcomes suitable for a Gen AI-enhanced learning activity.</li> <li>2. Use a Gen AI tool (e.g., ChatGPT, Gemini, or similar) to: <ul style="list-style-type: none"> <li>• Brainstorm ideas or generate draft learning activities - Model sample questions or prompts for students</li> <li>• Refine language, instructions, or differentiation strategies</li> </ul> </li> <li>3. In the Gen AI output, make annotations and justifications (in comment boxes or footnotes) to explain how Gen AI was used, what was accepted/modified/rejected, and why.</li> <li>4. Revise your lesson plan by referring to the principles/ theories relevant to learner autonomy and metacognitive development.</li> <li>5. Submit a 500-word reflective commentary discussing: <ul style="list-style-type: none"> <li>• How Gen AI influenced your instructional decisions</li> <li>• The benefits and risks of using Gen AI for lesson planning</li> <li>• How you would use Gen AI differently in future instructional design tasks</li> </ul> </li> </ol>
<b>Gen AI Tool(s) Required</b>	ChatGPT or Claude (prompt generation and editing)
<b>Rubric Criteria</b>	<ul style="list-style-type: none"> <li>• Quality and alignment of lesson plan with CLO and learner autonomy goals (30%)</li> <li>• Clarity and structure of instructional activities (20%)</li> <li>• Integration and critical use of Gen AI tools (20%)</li> <li>• Annotations and justification of instructional decisions (15%)</li> <li>• Reflection on Gen AI use and its pedagogical implications (15%)</li> </ul>



## Outline for Gen AI-Integrated Assessment Task

### SAMPLE 3: Pharmacy

<b>Course Lecturer</b>	Prof Dr XXX
<b>Programme</b>	Bachelor of Pharmacy (Hons)
<b>Course Code &amp; Course Name</b>	PHA3014 Pharmatherapy II
<b>Course Learning Outcome(s)</b>	Communicate drug information accurately to patients. (C4)
<b>Assessment Title &amp; weightage</b>	AI-Enhanced Patient Counselling Simulation (20%)
<b>Assessment Type</b>	Simulation and Written Reflection (Individual)
<b>Summary of Task</b>	<p>Students are required to simulate a drug counselling session with a patient for one of the following conditions:</p> <ul style="list-style-type: none"> <li>Hypertension, Asthma, Type 2 Diabetes Mellitus</li> </ul>
<b>Instructions to Students</b>	<ol style="list-style-type: none"> <li><b>Use a Gen AI tool</b> (e.g., ChatGPT, Microsoft Copilot, or other approved tools) to:           <ul style="list-style-type: none"> <li>Prepare a <b>personalised patient-friendly drug explanation script</b> (e.g., medication name, indication, dose, side effects, precautions).</li> <li>Generate <b>possible patient questions</b> and model appropriate responses.</li> <li>Review and refine the language and clarity of your communication using the AI.</li> </ul> </li> <li><b>Conduct a 5–7 minute simulated counselling session</b> (in person or recorded video) using your prepared script.</li> <li><b>Submit a 500-word written reflection</b> addressing:           <ul style="list-style-type: none"> <li>How Gen AI supported your preparation and understanding of drug information</li> <li>Any inaccuracies, limitations, or ethical concerns you encountered</li> <li>How you plan to use Gen AI in future clinical communication tasks</li> </ul> </li> <li><b>Append your AI interaction:</b> Include a screenshot or transcript of at least one Gen AI-generated output (e.g., counselling script, patient questions, or revised drafts).</li> <li><b>Academic Integrity &amp; Professionalism</b> You must:           <ul style="list-style-type: none"> <li>Use only approved Gen AI tools</li> <li>Declare what content was AI-generated or AI-enhanced</li> <li>Avoid full reliance on AI or plagiarism of AI content</li> <li>Maintain professional tone and accuracy in communication</li> </ul> </li> </ol>
<b>Gen AI Tool(s) Required</b>	ChatGPT or Bing Copilot
<b>Rubric Criteria</b>	Accuracy of drug information (30%), Clarity and readability of final version (25%), Quality of annotations and justifications (20%), Professional tone and patient-focus (15%), Reflection on Gen AI limitations (10%)




# APPENDIX 6C

## Gen AI in Assessment

### [Template] Outline for Gen AI-Integrated Assessment Task

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<h3>[TEMPLATE] Outline for Gen AI-Integrated Assessment Task</h3>	
<b>Course Lecturer</b>	
<b>Programme</b>	
<b>Course Code &amp; Course Name</b>	
<b>Course Learning Outcome(s)</b>	
<b>Assessment Task &amp; weightage</b>	
<b>Assessment Type</b>	
<b>Summary of Task</b>	
<b>Instructions to Students</b>	
<b>Gen AI Tool(s) Required</b>	
<b>Rubric Criteria</b>	



## APPENDIX 6D

### Gen AI in Assessment

#### [Rubric] Outline for Gen AI-Integrated Assessment Task

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#### [Rubric] Outline for Gen AI-Integrated Assessment Task

Course Lecturer						
Criteria	1 (Poor)	2 (Fair)	3 (Good)	4 (Excellent)	Score	
1 <b>Outcomes and Purpose of the Assessment</b>	The assessment <b>lacks alignment</b> with CLO(s) and shows <b>little or no</b> integration of Gen AI tool(s).	The assessment <b>somewhat aligns</b> with CLOs and integrates Gen AI tool(s) in a <b>basic or unclear</b> way.	The assessment <b>aligns</b> with CLOs and integrates Gen AI tool(s) in a <b>purposeful and supportive</b> manner.	The assessment is <b>strongly aligned</b> with CLOs and meaningfully integrates Gen AI tool(s) to <b>enhance learning outcomes</b> .		
2 <b>Cognitive Engagement</b>	The assessment <b>does not promote</b> higher-order thinking with <b>minimal or no</b> integration of Gen AI tool(s).	The assessment <b>somewhat promotes</b> higher-order thinking through <b>simple</b> use of Gen AI tool(s).	The assessment <b>promotes</b> higher-order thinking through <b>structured and purposeful</b> use of Gen AI tool(s).	The assessment <b>strongly promotes</b> higher-order thinking through <b>strategic and effective integration</b> of Gen AI tool(s).		
3 <b>Feedback and Support Mechanisms</b>	The assessment <b>lacks</b> feedback opportunities and <b>does not utilise</b> Gen AI tool(s) for support.	The assessment includes <b>basic and generic</b> feedback with <b>limited</b> or <b>superficial</b> use of Gen AI tool(s).	The assessment includes <b>meaningful, timely</b> feedback mechanisms that are <b>generally supported</b> by Gen AI tool(s).	The assessment includes <b>strong, specific, and actionable</b> feedback mechanisms <b>fully supported</b> by Gen AI tool(s), <b>effectively guiding</b> students to improve their assessment outcomes.		
4 <b>Ethical Consideration</b>	The assessment <b>lacks</b> guidance or expectations for the ethical use of Gen AI tool(s).	The assessment provides <b>basic guidance</b> with limited clarity on the ethical use of Gen AI tool(s).	The assessment includes <b>most</b> expectations for ethical and responsible use of Gen AI tool(s), including academic integrity.	The assessment includes <b>clear</b> expectations for ethical and responsible use of Gen AI tool(s), including academic integrity.		
5 <b>Reflection and Metacognition</b>	The assessment <b>lacks</b> opportunities for students to reflect on how Gen AI tool(s) supported their learning.	The assessment offers <b>some</b> opportunities for students to reflect on how Gen AI tool(s) supported their learning.	The assessment includes <b>structured</b> opportunities for students to reflect on how Gen AI tool(s) supported their learning, including benefits and limitations.	The assessment provides <b>deep, guided reflection tasks</b> that prompt students to critically evaluate how Gen AI tool(s) supported their learning, thinking, and future use.		
<b>Total Score)</b>					<b>(    ) / 20</b>	
<b>Assessed by</b>				<b>Date</b>		
<b>Remarks/ Comments</b>						



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