

Vignette on the use of AI in QCP12A and ACP22A

Course	QCP 12A and ACP 22A Understanding the Physics Curriculum
Modality	Two face-to-face workshops (Sessions 06 and 07; 3 hours each), followed by individual assignments and feedback.
Intended Learning Outcomes	1. Explain GenAI capabilities, limitations, probabilistic outputs, retrieval-augmented generation (RAG) and ethical use. 2. Design and evaluate a customised chatbot for physics inquiry while preserving student agency. 3. Integrate a customised chatbot into model-based inquiry and differentiated instruction.
Role of Faculty	Before Sessions 06 and 07: 1. Prepare curriculum sources, a dialogic chatbot, worksheets and the MOE AI-in-Education Ethical Framework. 2. Test chatbot instructions, source documents and safeguards. During Sessions 06 and 07: 1. Introduce GenAI literacy, verification, chatbot design and evaluation in Session 06. 2. Use conflicting chatbot responses to model verification. 3. Introduce six-stage model-based inquiry in Session 07. 4. Guide groups to place chatbot interactions in the inquiry cycle, considering conceptual, epistemic, social and ethical dimensions. Assignments and feedback: 1. Require a customised chatbot, rationale, and AI declaration in both assignments. 2. Arrange peer feedback, provide instructor feedback
Role of Students Learning as Designing: Process Learning as Participating: Practice	Session 06: 1. Experience a developed chatbot and examine how instructions and sources shape responses. 2. Design and test a physics chatbot for accuracy, clarity, usability and dialogue flow. Discuss misleading responses and responsible use. Session 07: 1. Decide where chatbot interactions should occur or be avoided in the six-stage inquiry sequence. 2. Design an activity around a phenomenon, scientific question, guiding questions and planned chatbot interactions. Assignments: 1. Develop a 45- to 60-minute inquiry activity and chatbot for Assignment 1, explaining how chatbot support students' inquiry. 2. Adapt both for differentiated instruction in Assignment 2
Role of AI	Use of customised GenAI chatbots to guide questioning, evidence checks and model refinement at selected inquiry stages. Students verify the responses with evidence, peers and the teacher. Learning about AI Learning Beyond AI Learning to teach science with AI
Artefacts (if any)	Chatbot design worksheets; GenAI-integrated inquiry plans for Assignments 1 and 2 with rationales of the use of AI for students' inquiry