Multidisciplinary Approach to Explore Good Pedagogy Strategies in Project Guidance

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Blog Link

Introduction

This learning community comprises faculty members from different disciplinaries and departments. The primary objective of the team is to share and explore effective pedagogy methods in continuous assessment (CA) guidance. To achieve such goal, we focus on the critical thinking methodology and the use of GenAI technology for CA guidance.

Examples of such CA are:

- Essay-based **assignment**: Build-up a reflection portfolio throughout a semester
- Engineering-based **project**: Identify the requirement during early semester, build, revise and demonstrate prototype by the end of semester.

Critical Thinking

- Its definition and application vary across disciplines.
- ***Physic*** emphasizes the understanding of principles, problem solving skill and questioning the assumption
- ***Integrated Humanities*** course focuses on careful attention to words and the reasoning processes behind written and verbal expressions.

Critical Thinking → (Academic: *Shifting*) → Broader Skill Cluster

GenAI for learning (Approaches)

- **Accurate Ranking:** Enables student to immediately resolve a problem. But GenAI may mask shallow understanding. Alternative assessment such as face-to-face Q&A is important to ensure student gain in-depth understanding.
- **Maximize Learning:** Result are not directly produced by GenAI. Student requires certain effort in critical thinking to integrate output from GenAI into result. Student may be required to spend additional time and effort.

Blend GenAI with Critical Thinking Process

Mandatory:
- Guidance of using GenAI is provided to students

→ Collect assignments completed before and after GenAI use

→ Collect Student's Feedback on GenAI use

Optional and Encourage:
- Guidance on using GenAI was provided.
- No guidance on using GenAI was provided.

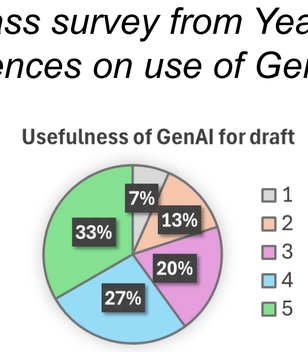
→ Collect Assignment / Projects

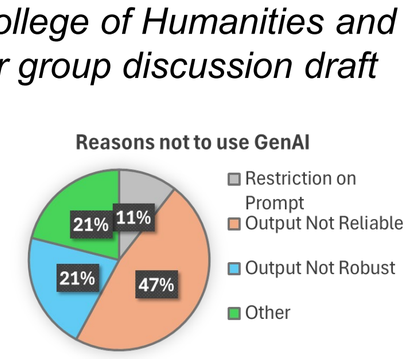
→ Collect GenAI usage declarations

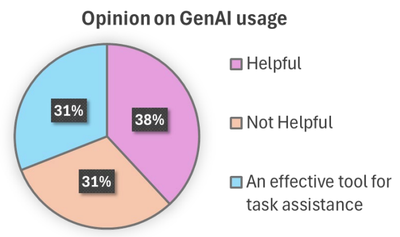
→ Compare performance between GenAI-assisted and non-GenAI-assisted work

Student feedback on use of GenAI

In-class survey from Year 1 College of Humanities and Sciences on use of GenAI for group discussion draft





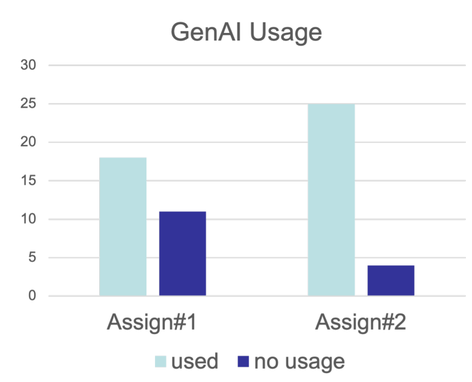


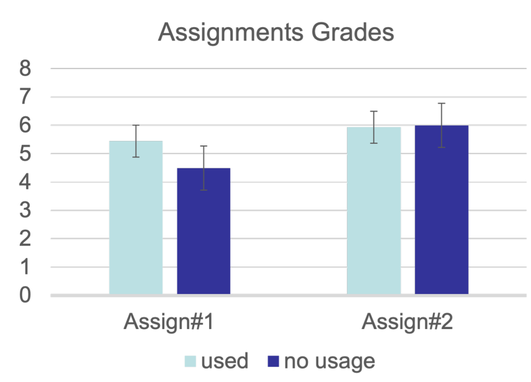
Observation / Outcome

How the use of GenAI impacts performance:

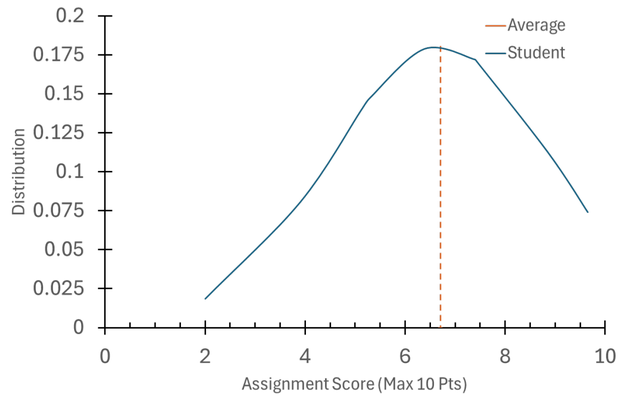
- A high-quality initial draft enables GenAI to produce better revisions.
- Follow-up prompts or cross-validation can improve the quality of outputs generated by GenAI.
- Effective prompts enable GenAI to respond accurately.
- Directly implementing GenAI-generated code without evaluation
- Lack of understanding of the formulation or lecture content.

Data analysis for MSc technical elective course for wearables





Algorithm implementation assignment/project in Space Technology Specialization Course with GenAI used



Reflections on the Learning Community Project

Students do not regard GenAI as the ultimate problem-solving tool when other options are available
- ➢No fixed demographic pattern was observed in terms of which students were more likely to use GenAI

Students often see GenAI outputs as authoritative rather than as suggestions
- ➢GenAI is not always reliable, and output reliability remains a concern

The impact of GenAI use:
- ➢It does not guarantee above-average results
- ➢It does not significantly improve students' performance without additional effort to refine the GenAI-generated work
- ➢Follow-up prompts, cross-validation and prompting methods are important