



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

E-PORTFOLIO

**Generative Artificial Intelligence and the Development of
Independent Learning and Critical-Thinking Skills Among
Undergraduate Accounting Students in Klang Valley, Malaysia**

Student: Uzair Arman bin Mohammad

ID Number : 2423913

Programme: Bachelor of Business Administration in
Finance

Module: Changemakers: Creativity and Value
Creation // IUBA5010

Prepared for: Dr. Emma Roberts

Academic Year: 2025 Portfolio Brief

Generative Artificial Intelligence Provider: ChatGPT
(OpenAI)

Table of Contents

E-PORTFOLIO	1
GENERATIVE ARTIFICIAL INTELLIGENCE AND THE DEVELOPMENT OF INDEPENDENT LEARNING AND CRITICAL-THINKING SKILLS AMONG UNDERGRADUATE ACCOUNTING STUDENTS IN KLANG VALLEY, MALAYSIA	1
INTRODUCTION.....	5
TASK 1 – IDENTIFICATION AND EXPLORATION OF THE PROBLEM.....	6
1.1 IDENTIFICATION OF THE PROBLEM.....	6
EVIDENCE TO INCLUDE IN TASK 1	ERROR! BOOKMARK NOT DEFINED.
FIGURE 1 – PERSONAL ACADEMIC CONTEXT	8
FIGURE 2 – ACTUAL GENAI USE	8
TASK 2 – GENERATIVE AI, ACADEMIC LITERATURE AND PROBLEM DEFINITION ...	9
2.1 PURPOSE OF USING GENERATIVE AI	9
2.2 PROMPT USED.....	9
2.3 SELECTED AI OUTPUT	9
2.4 CRITICAL INTERROGATION OF THE AI OUTPUT	11
2.5 ADDITIONAL ACADEMIC SOURCES	12
CORE GENAI AND HIGHER-EDUCATION LITERATURE	12
TASK 3 – RESEARCH QUESTION AND RESEARCH APPROACH	13
3.1 AI PROMPT.....	13
3.2 ALTERNATIVE RESEARCH QUESTIONS GENERATED	13
3.3 SELECTED RESEARCH QUESTION	14
FINAL RESEARCH QUESTION	14
3.4 JUSTIFICATION	15
3.5 PROPOSED RESEARCH APPROACH.....	15
TASK 4 – SUMMARY RESEARCH PROPOSAL	17
4.1 RESEARCH QUESTION	17
4.2 BACKGROUND AND RATIONALE.....	17
4.3 DEFINITION OF KEY TERMS	17
GENERATIVE ARTIFICIAL INTELLIGENCE	18
GENERATIVE AI USE	18
INDEPENDENT LEARNING	18

CRITICAL THINKING	18
4.4 CONCEPTUAL FRAMEWORK.....	19
4.5 RESEARCH DESIGN	19
4.6 POPULATION AND SAMPLING	20
4.7 QUESTIONNAIRE DESIGN	20
SECTION A – DEMOGRAPHICS	20
SECTION B – GENAI USAGE	21
SECTION C – AI VERIFICATION BEHAVIOUR	21
SECTION D – INDEPENDENT LEARNING.....	21
SECTION E – CRITICAL THINKING.....	21
4.8 RELIABILITY	22
4.9 VALIDITY.....	22
CONTENT VALIDITY	22
FACE VALIDITY	22
CONSTRUCT VALIDITY	22
INTERNAL VALIDITY	23
4.10 ETHICAL CONSIDERATIONS.....	23
4.11 DATA ANALYSIS	24
DESCRIPTIVE STATISTICS	24
RELIABILITY ANALYSIS.....	24
CORRELATION	24
REGRESSION	24
4.12 EXPECTED CONTRIBUTION.....	24
 <u>TASK 6 – GIBBS REFLECTIVE CYCLE.....</u>	 26
 6.1 DESCRIPTION	 26
6.2 FEELINGS.....	26
6.3 EVALUATION	27
6.4 ANALYSIS.....	27
6.5 CONCLUSION.....	28
6.6 ACTION PLAN.....	28
 <u>GIBBS REFLECTIVE CYCLE IMAGE.....</u>	 29
 <u>REFERENCE</u>	 30
 ACCOUNTING + GENAI	 30
GENAI + HIGHER EDUCATION.....	30
CRITICAL THINKING / COGNITIVE EFFECTS	32
SELF-REGULATED LEARNING.....	32
ACADEMIC INTEGRITY	32
RESEARCH METHODOLOGY	32

ONE IMPORTANT IMPROVEMENT TO THE RESEARCH DESIGN ERROR! BOOKMARK NOT DEFINED.

GENAI DEPENDENCE..... ERROR! BOOKMARK NOT DEFINED.

RESPONSIBLE AI USE ERROR! BOOKMARK NOT DEFINED.

TASK 5 – FIVE-MINUTE VIDEO PRESENTATION ERROR! BOOKMARK NOT DEFINED.

MAXIMUM: 5 SLIDES..... ERROR! BOOKMARK NOT DEFINED.

SLIDE 1 — THE LOCAL PROBLEM ERROR! BOOKMARK NOT DEFINED.

GENERATIVE AI IN ACCOUNTING EDUCATION..... ERROR! BOOKMARK NOT DEFINED.

MAIN STATEMENT: ERROR! BOOKMARK NOT DEFINED.

SLIDE 2 — WHAT DOES RESEARCH TELL US?..... ERROR! BOOKMARK NOT DEFINED.

EVIDENCE IS MIXED ERROR! BOOKMARK NOT DEFINED.

SLIDE 3 — RESEARCH QUESTION ERROR! BOOKMARK NOT DEFINED.

**TO WHAT EXTENT IS GENERATIVE AI USE ASSOCIATED WITH PERCEIVED DEVELOPMENT OF
INDEPENDENT LEARNING AND CRITICAL-THINKING SKILLS AMONG UNDERGRADUATE
ACCOUNTING STUDENTS IN KLANG VALLEY, MALAYSIA? ERROR! BOOKMARK NOT DEFINED.
WHY? ERROR! BOOKMARK NOT DEFINED.**

SLIDE 4 — RESEARCH DESIGN ERROR! BOOKMARK NOT DEFINED.

QUANTITATIVE CROSS-SECTIONAL SURVEY ERROR! BOOKMARK NOT DEFINED.

MAIN VARIABLES..... ERROR! BOOKMARK NOT DEFINED.

SLIDE 5 — REAL-WORLD APPLICATION..... ERROR! BOOKMARK NOT DEFINED.

WHY DOES THIS MATTER? ERROR! BOOKMARK NOT DEFINED.

CLOSING STATEMENT ERROR! BOOKMARK NOT DEFINED.

INTRODUCTION

GenAI has made tremendous progress ever since the launch of ChatGPT in late 2022. The earlier generations of educational technology were used mainly for information searching and delivery; however, GenAI has the capability of creating explanations, summaries, examples, arguments, calculations, and many more types of content in response to natural-language input. GenAI has great potentials for use in higher education at the same time posing challenges concerning academic integrity, assessment, learning, and the development of higher-order thinking skills.

The issue is especially relevant in the case of accounting education. It is expected from accounting students not only to have technical knowledge but also the ability to analyze, exercise professional judgement, solve problems, be skeptical, and interpret evidence. Thus, the very existence of an AI tool that could create apparently sophisticated output poses an important question for education: Does GenAI improve students' learning, or does their misuse of it reduce the amount of cognitive work performed by the students? Recent accounting-specific research demonstrates that this is not merely a theoretical concern. Sundkvist and Kulset (2024) found that accounting students perceive ChatGPT as useful and that perceived usefulness is related to technological enthusiasm, ease of use and social influence. Zhou and Luo (2025) found that approximately 80% of their accounting-student sample used AI at least weekly, primarily to obtain assistance with difficult concepts. More recent research involving 312 accounting students also found that students consulted ChatGPT for learning support more frequently than professors or teaching assistants, with ChatGPT expertise being associated with course performance.

However, literature review suggests that it would be inaccurate to generalize GenAI's effect in one way or another, as there is meta-analytic research which shows the positive impact of GenAI usage on academic performance and higher order thinking tendencies under some conditions; and systematic reviews that identify the dangers related to decreased mental effort and cognitive offloading.

Thus, the present portfolio deals with a particular and well-defined local issue: how undergraduate students of accounting in Klang Valley (Malaysia) employ GenAI and its relation to their ability to learn independently and think critically.

TASK 1 – IDENTIFICATION AND EXPLORATION OF THE PROBLEM

1.1 Identification of the problem

This problem is derived from personal experiences while working as an undergraduate student specializing in accounting. In the course of my education, I have realized that Generative Artificial Intelligence software such as ChatGPT is becoming widely available for students. Students can employ such software to make sense of complex accounting theories, give examples, summarize information, verify calculations, organize their work, and give suggestions for answering questions

My concern is not that students use AI. Instead, my concern is whether the increasing convenience of GenAI can change the way students learn. As a personal case in point, I, myself have relied and diversify the way I look up for information. For example, I have observed and experienced a situation in which using AI search engines like OpenAI, Apple's Siri, Grok and Microsoft's Copilot to look up information that is more detailed and precise at the tip of my fingers and results can be obtained within a few seconds whereas previously, I need to scrounge databases and libraries to get the same level of information that is very possibly taking days if not weeks of meticulous research. This made me question whether obtaining an immediate AI-generated answer necessarily means that the student has understood the accounting principle behind that answer.

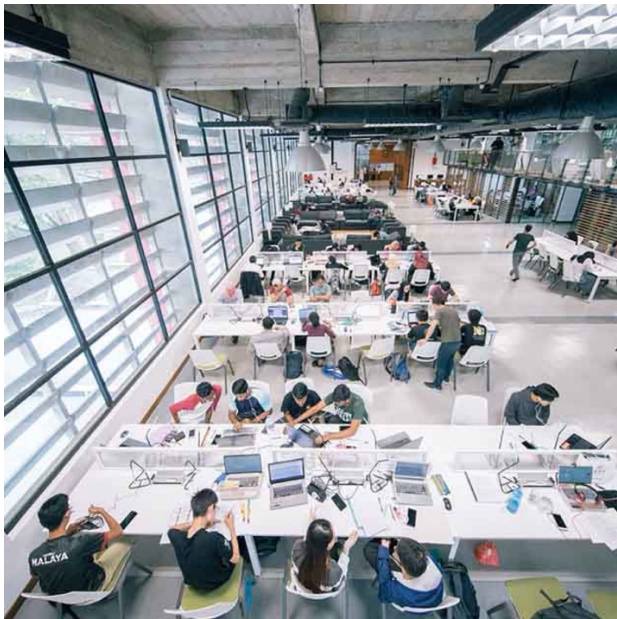
This problem is especially significant within the realm of accounting as university education is meant to train a person to do more than merely reproduce facts. Students studying accounting have to analyse information, solve problems, make decisions based on professional judgment, and critique any piece of evidence. In case students always allow AI to undertake such tasks, there is a possibility that students' successful performance in terms of academic assignments might not imply a parallel development of relevant skills.

Another reason why this topic is highly significant for my local community is the fact that Klang Valley features many universities, accounting courses, professional firms, and businesses. In other words, graduates who obtain education here will become part of a new generation of accountants which is going to experience automation and artificial intelligence

within the profession. Consequently, students cannot be prepared for the future if they are just told to refrain from using AI.

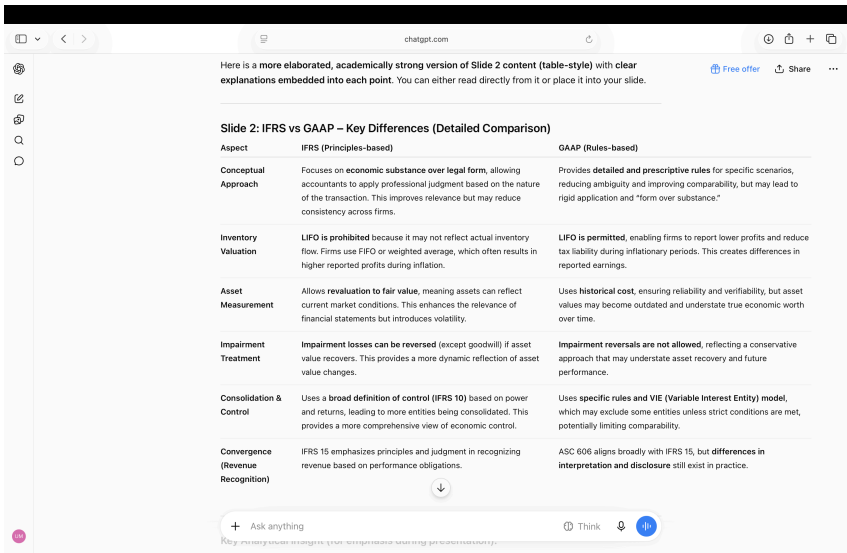
The problem is consequently a balance between **AI-assisted learning and AI-dependent learning**. The former may improve access to explanations and learning support, whereas the latter may involve cognitive offloading and reduced independent engagement. Recent accounting research reinforces the relevance of this distinction.

Figure 1 – Personal academic context



Caption:
Figure 1. My university learning environment in Klang Valley. The photograph demonstrates the local academic context in which the identified problem occurs.

Figure 2 – Actual GenAI use



Caption:
Figure 2. Example of Generative AI being used as an academic learning-support tool.

TASK 2 – GENERATIVE AI, ACADEMIC LITERATURE AND PROBLEM DEFINITION

2.1 Purpose of using Generative AI

I used ChatGPT (OpenAI) as a research-support tool to explore the academic literature surrounding the problem. I did not treat ChatGPT as an academic authority. Instead, I used it to identify terminology, competing explanations, potential theoretical concepts and possible research gaps. The resulting claims and references were then checked against traceable academic publications.

2.2 Prompt used

“I am an undergraduate accounting student in Klang Valley, Malaysia. I am investigating the problem of undergraduate accounting students increasingly using Generative AI tools such as ChatGPT for academic learning. I am particularly interested in whether AI supports independent learning and critical-thinking development or whether excessive reliance on AI may reduce independent cognitive effort. Using recent peer-reviewed academic literature, identify the key concepts, theories, terminology, empirical findings, competing perspectives and research gaps relevant to this problem. Prioritise accounting education and higher education research from 2023–2026. Do not invent references. For every recommended source, provide a DOI or a traceable publisher record. Explain which findings support and challenge the proposed problem. Finally, propose a precise and academically defensible problem definition suitable for a small undergraduate research project in Klang Valley.”

2.3 Selected AI output

These were the few concepts picked up by the AI as being pertinent to the research problem:

1. Generative Artificial Intelligence
2. Large Language Models
3. AI enabled Learning
4. AI Adoption
5. Perceived Usefulness

6. Self-Regulated Learning
7. Cognitive Offloading
8. Independent Learning
9. Critical Thinking
10. Higher order thinking
11. AI Literacy
12. Professional Judgement.

It is evident from the literature that GenAI can offer real value to learning and education. A systematic review and meta-analysis of experimental studies discovered the positive impacts on academic performance, affective-motivational outcomes and higher-order thinking abilities, despite the methodological gaps noted by the authors.

There is similar accounting-related literature available as well. Sundkvist and Kulset (2024) concluded that ChatGPT was perceived to be useful by students and that the intention to use was related to the ease of use, enthusiasm and social influence. The results of a 2025 study of a group of accounting students, which examined their usage of AI, showed the widespread weekly usage of AI and that difficult topics were a reason for using ChatGPT. A study conducted in 2025 on data analytics in accounting, involving 312 students, showed that ChatGPT was used as an aid to learn because of its ease of use and stress-free environment.

Nevertheless, the literature presents some challenges. A systematic review on the excessive use of AI dialogue systems reveals some impacts on the cognitive functions of students, while studies on business school students present some challenges related to reliability, accuracy and impacts of AI text generators on critical thinking.

The most appropriate problem definition is therefore:

“The problem is not simply that undergraduate accounting students use Generative AI. The problem is the uncertainty surrounding whether students are using GenAI as a tool that supports independent learning and critical evaluation, or increasingly relying on it to perform cognitive tasks that university accounting education is intended to develop independently.”

2.4 Critical interrogation of the AI output

I did not just take for granted the conclusions generated by AI. It is because Generative AI can provide plausible and unsupported claims and references. In order to avoid this, I used three precautions.

Firstly, I cross-checked references against publishers' databases, DOIs, and peer-reviewed journals. As an example, accounting research conducted by Sundkvist and Kulset (2024) and Zhou and Luo (2025), as well as the 2025 accounting data analytics research can be traced via the ScienceDirect database of Elsevier.

Secondly, I cross-checked the results in different studies instead of just believing one. It was important as the literature does not give any unanimous opinion. According to the experimental evidence, ChatGPT can help enhance some learning outcomes while cognitive offloading and critical thinking issues raise concerns about its uncontrolled use.

Thirdly, I intentionally avoided causation. For instance, I did not write that "ChatGPT causes poor critical thinking". Such a statement required appropriate causal research design. My proposed research only studies the relationship between GenAI usage and perceived learning outcomes.

This verification process changed my understanding of the problem. Initially, I considered the issue primarily as an academic-integrity problem. The literature demonstrated that this was too narrow. GenAI is simultaneously an educational opportunity, a technological development, an assessment challenge and a potential influence on cognitive processes.

2.5 Additional academic sources

The literature base should be expanded beyond ten sources. The following are particularly useful because they cover **accounting education, higher education, critical thinking, self-regulated learning, AI adoption, academic integrity and research methodology**.

Core GenAI and higher-education literature

Baig, M. I., & Yadegaridehkordi, E. (2024). ChatGPT in higher education: A systematic literature review and research challenges. *International Journal of Educational Research*, 127, 102411. <https://doi.org/10.1016/j.ijer.2024.102411>

Deng, R., Jiang, M., Yu, X., Lu, Y., & Liu, S. (2024). Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies. *Computers & Education*, 208, 105224. <https://doi.org/10.1016/j.compedu.2024.105224>

Mohebi, L. (2024). Empowering learners with ChatGPT: Insights from a systematic literature exploration. *Discover Education*, 3, 36. <https://doi.org/10.1007/s44217-024-00120-y>

Singh Bhullar, P., Joshi, M., & Chugh, R. (2024). ChatGPT in higher education – A synthesis of the literature and a future research agenda. *Education and Information Technologies*, 29, 21501–21522. <https://doi.org/10.1007/s10639-024-12723-x>

Yusuf, A., et al. (2024). Generative AI in education and research: A systematic mapping review. *Review of Education*. <https://doi.org/10.1002/rev3.3489>

TASK 3 – RESEARCH QUESTION AND RESEARCH APPROACH

3.1 AI prompt

Problem: undergraduate accounting students increasingly use Generative AI. There is uncertainty about whether GenAI supports independent learning and critical thinking or encourages cognitive offloading and dependence.

The study will be carried out by one undergraduate researcher in Klang Valley, Malaysia for about 12 weeks. The researcher has a limited budget and limited access to mainly undergraduates. Do not select research questions that require a national sample, executives, longitudinal data, or experimentation that the researcher does not have a realistic chance of getting. “For each research question, describe the variables, research method, sampling strategy, data collection strategy, expected data analysis, and major constraint. Recommend the best research question and explain your choice.”

3.2 Research Questions Generated

RESEARCH QUESTION 1:

What factors influence undergraduate accounting students’ intention to use Generative AI for academic purposes?

RESEARCH QUESTION 2:

How do undergraduate accounting students perceive the benefits and risks of Generative AI in their academic learning?

RESEARCH QUESTION 3:

To what extent is Generative AI use associated with perceived independent learning among undergraduate accounting students?

RESEARCH QUESTION 4:

To what extent is Generative AI use associated with perceived development of critical-thinking skills among undergraduate accounting students?

RESEARCH QUESTION 5:

To what extent is Generative AI use associated with perceived development of independent learning and critical-thinking skills among undergraduate accounting students in Klang Valley, Malaysia?

3.3 Selected Research Question

Final Research Question

To what extent is Generative AI use associated with perceived development of independent learning and critical-thinking skills among undergraduate accounting students in Klang Valley, Malaysia?

3.4 Justification

I chose RESEARCH QUESTION 5 since it strikes the best balance of being relevant academically and feasible in terms of implementation.

RESEARCH QUESTION 1 would focus more on technology adoption than on learning. Even though technology adoption is important, the research question would shift attention from the main problem revealed during Task 1.

RESEARCH QUESTION 2 could provide some good descriptive data, but it would still be fairly broad and potentially hard to analyse in a systematic way.

RESEARCH QUESTION 3 and RESEARCH QUESTION 4 are also quite specific, but researching only one learning outcome would mean excluding an essential part of the problem. Independent learning is related to student responsibility, while critical thinking is related to information evaluation, analysis and reasoning. These concepts are similar, but they are not the same.

RESEARCH QUESTION 5 includes both concepts in an adequately narrow framework.

Notably, I consciously choose the phrase “associated with” rather than “causes” here. Cross-sectional survey can reveal connections between variables, but it cannot reveal their temporal precedence and causality.

3.5 Proposed research approach

Quantitative cross-sectional research design using a structured questionnaire shall be employed for this study.

Philosophical approach to be employed will be largely positivist, in that the study attempts to operationalize concepts into quantifiable variables and statistical analysis of relationship between the variables. The approach will be deductive in that the concepts derived from literature will be used to formulate the questionnaires and test relationship among concepts.

The population of study will be the undergraduate accounting students enrolled in universities in Klang Valley area. I propose collecting 100 to 150 samples of data, depending on the actual accessibility of respondents.

A probability sampling frame will not be readily available for me to use; hence, purposive convenience sampling method shall be used. This is the limitation of the study, but more

realistic than saying that I can get a representative random sample of Malaysian accounting students.

TASK 4 – SUMMARY RESEARCH PROPOSAL

4.1 Research question

To what extent is Generative AI use associated with perceived development of independent learning and critical-thinking skills among undergraduate accounting students in Klang Valley, Malaysia?

4.2 Background and rationale

Generative AI has been swiftly adopted into higher education. The findings from systematic reviews show that ChatGPT is being utilized for various academic activities such as explanation, writing support, information search, and learning support.

The accounting profession is especially pertinent as the profession relies heavily on technology. As such, accounting graduates not only need to be technologically competent but also analytical thinkers and possess professional judgment skills.

Recent studies have found significant adoption rates of AI by accounting students. For instance, in their recent study, Zhou and Luo (2025) reported that around 80% of their respondents utilize AI regularly, especially for getting help with difficult concepts. Another recent study involving 312 accounting data-analytics students reported usage of ChatGPT as a help-seeking tool and its low-pressure environment as a benefit.

It should be noted that the impact of GenAI on education depends on its utilization.

The research question posed here aims to examine the association between GenAI utilization and two educational outcomes: Independent Learning And Critical Thinking.

4.3 Definition of key terms

Generative Artificial Intelligence

GenAI refers to AI systems capable of generating new content in response to user instructions. In this study, the term refers primarily to conversational large language model applications such as ChatGPT.

Generative AI use

GenAI use will refer to the frequency and manner in which students employ tools such as ChatGPT for academic purposes. This includes explaining concepts, generating ideas, checking answers, summarising material, solving problems and producing written content.

Independent learning

Independent learning refers to the student's capacity to take responsibility for learning activities, including identifying learning needs, setting goals, seeking information, evaluating information and monitoring progress.

Self-regulated learning literature is relevant because effective independent learning requires learners to regulate cognitive, motivational and behavioural processes. Research on GenAI suggests that AI can potentially support self-regulation when used appropriately.

Critical thinking

Critical thinking concerns the ability to analyse information, evaluate evidence, identify assumptions and reach reasoned conclusions. It is particularly important to accounting because professional accounting decisions cannot be reduced simply to retrieving predetermined answers.

4.4 Conceptual framework

The proposed conceptual framework is:

Generative AI Use

↓

Perceived Independent Learning

and

Perceived Critical-Thinking Development

Potential control variables:

- Age
- Gender
- Year of study
- Previous AI experience
- Academic performance
- Frequency of accounting-related AI use

The study does not assume that the relationship must be **positive or negative**.

4.5 Research design

The proposed study will employ a **cross-sectional quantitative survey design**.

This approach is appropriate because:

1. The variables can be operationalised using structured questionnaire items.
2. Participants can be accessed relatively easily.
3. Data collection can occur within a limited period.
4. Statistical analysis can identify associations.
5. The design does not require access to confidential university records.

A cross-sectional design does, however, prevent strong causal conclusions. The research will therefore report **associations rather than causal effects**.

4.6 Population and sampling

The target population will be undergraduate accounting students studying within Klang Valley.

The intended sample is approximately **100–150 respondents**.

The proposed sampling technique is purposive convenience sampling. Participants could realistically be recruited through:

- university student societies;
- accounting student WhatsApp groups;
- Telegram groups;
- classmates;
- personal academic networks;
- student social-media groups.

This sampling approach improves feasibility but reduces generalisability. The study will therefore explicitly state that findings should not be interpreted as representative of every accounting student in Malaysia.

4.7 Questionnaire design

The questionnaire could contain five sections:

Section A – Demographics

- Age
- Gender
- Year of study
- University
- Previous AI experience

Section B – GenAI usage

Items measuring:

- Frequency;
- Duration;
- Purpose;
- Type Of Academic Task;
- Reliance.

Section C – AI verification behaviour

Example:

“I verify information generated by AI using textbooks, academic articles or other reliable sources.”

Section D – Independent learning

Items measuring:

- Self-Directed Study;
- Independent Information Seeking;
- Learning Responsibility;
- Ability To Study Without AI Assistance.

Section E – Critical thinking

Items measuring:

- Evaluation Of Evidence;
- Questioning AI Responses;
- Identifying Errors;
- Comparing Alternative Explanations;
- Independent Reasoning.

Likert scales from **1 = Strongly disagree** to **5 = Strongly agree** would provide relatively straightforward quantitative analysis.

4.8 Reliability

The reliability issue is about the stability of measurements generated by the questionnaire.

A pilot test with about 10 to 15 respondents will be done prior to administering the actual survey. Questions that are ambiguous and repetitious may then be improved.

Internal consistency can also be tested using Cronbach's Alpha. Cronbach's (1951) coefficient alpha has long been considered a recognized index of internal consistency.

Yet having a good alpha does not guarantee that the instrument is valid. Reliability and validity must thus be addressed separately but simultaneously.

4.9 Validity

Content validity

Questionnaire items will be derived from established literature rather than created solely from personal assumptions.

Face validity

The pilot group will assess whether the questionnaire is understandable and whether questions appear relevant.

Construct validity

Items measuring GenAI use, independent learning and critical thinking should correspond clearly to their theoretical definitions.

Internal validity

Because this is a cross-sectional study, internal validity will be limited. Confounding variables may influence the observed relationship. For example, students with stronger academic ability may both use AI more effectively and perform better academically.

Therefore, I will avoid claiming that GenAI itself causes improvements or deterioration in critical thinking.

4.10 Ethical considerations

Participation will be voluntary.

Participants will receive an explanation of:

- the research purpose;
- expected completion time;
- voluntary participation;
- confidentiality;
- anonymity;
- data use;
- withdrawal arrangements.

No unnecessary personal information will be collected.

This is especially important because asking students about AI use could create concerns regarding academic misconduct. The questionnaire should therefore explicitly state that the study is **not an investigation of individual academic misconduct**.

4.11 Data analysis

The following analysis could realistically be undertaken:

Descriptive statistics

- Frequencies
- Percentages
- Means
- Standard deviations

Reliability analysis

- Cronbach's alpha

Correlation

Pearson's correlation could be used where assumptions are appropriately met to examine relationships between GenAI-use measures and perceived learning outcomes.

Regression

In case of sufficient sample size and proper assumptions, multiple regression can be used to determine whether there is a relationship between the GenAI use variables and independent learning/critical thinking scores, taking into consideration the chosen control variables.

In case of insufficient sample size, the study should be kept on descriptive and correlational analysis only.

4.12 Expected contribution

The study could contribute in three ways.

First, it could provide evidence about how accounting students actually use GenAI rather than relying solely on theoretical discussion.

Second, it could help distinguish productive AI use from potentially dependent use.

Third, it could contribute to discussions about how accounting education should prepare students for an AI-enabled profession.

The research will not attempt to determine whether AI should be banned. Instead, it seeks to understand how students can use AI while retaining the cognitive capabilities expected of future accounting professionals.

TASK 6 – GIBBS REFLECTIVE CYCLE

6.1 Description

My initial identification of the problem for this portfolio was derived from my personal academic setting where there has been an increase in the adoption of Generative AI by university students. My first perception of the problem was that it is basically an integrity problem whereby students can use ChatGPT to answer questions without necessarily knowing the concepts involved in accounting.

In Tasks 1 to 5, however, I developed a deeper perception of the problem. It is clear that AI use cannot be either considered cheating or legitimate learning. Students may use AI in order to help them understand difficult concepts or get feedback. Students can also use AI in order to escape the effort required to learn and understand concepts on their own.

6.2 Feelings

At the beginning, I felt uncertain about whether my chosen problem was sufficiently academic. I initially believed that a research project needed to address a large organisational or societal issue. The portfolio process changed this perception.

I became more confident when I realised that a small, clearly defined problem within my own academic environment could produce a more realistic research project. I also felt cautious about using AI itself to develop a project about AI. This created a potential contradiction: I was investigating the responsible use of AI while relying on AI as a research-support tool.

This encouraged me to become more critical of AI-generated information and to verify academic sources independently.

6.3 Evaluation

One of the most positive aspects of the process was learning how to use Generative AI as an exploratory tool rather than an authority. ChatGPT helped me identify concepts such as cognitive offloading, self-regulated learning, AI adoption and critical thinking. It also helped me compare possible research questions.

However, I learned that fluent AI-generated text does not automatically constitute reliable academic evidence. Some AI-generated references may be incomplete, inaccurate or unsuitable. Consequently, checking DOI records and publisher information became an essential part of my process.

Another important lesson was that my original problem was too broad. Asking whether ChatGPT is “good or bad” for students would not produce a strong research project. Refining the issue to the relationship between GenAI use, independent learning and critical thinking produced a more academically manageable question.

6.4 Analysis

The literature changed my understanding of the relationship between AI and learning. I initially expected the research to demonstrate that AI either improves or damages learning. Instead, the evidence is considerably more nuanced.

Some experimental research identifies positive effects on academic achievement and higher-order-thinking propensities, while other literature identifies concerns regarding cognitive offloading and over-reliance. Accounting-specific studies similarly show that students use AI extensively and can derive genuine learning benefits from it.

This taught me that good research should not begin with a conclusion. Instead, it should begin with an uncertainty that can be investigated systematically.

I also learned that methodology must match the research question. I initially considered asking whether AI “causes” changes in critical thinking. However, I recognised that my proposed cross-sectional survey could not establish causality. I therefore changed the wording to “associated with”. This was an important methodological decision.

6.5 Conclusion

The most significant lesson I gained from Tasks 1–5 is that research quality depends heavily on scope. A realistic research project with a clearly accessible population is more defensible than an ambitious project that I cannot actually complete.

I also learned that AI literacy should involve more than knowing how to write effective prompts. It requires the ability to question AI-generated information, verify sources, identify limitations and maintain independent judgement.

This is particularly relevant to my future accounting career because accountants will increasingly work alongside AI-enabled technologies. I therefore need to develop the ability to use AI efficiently without surrendering professional judgement to it.

6.6 Action Plan

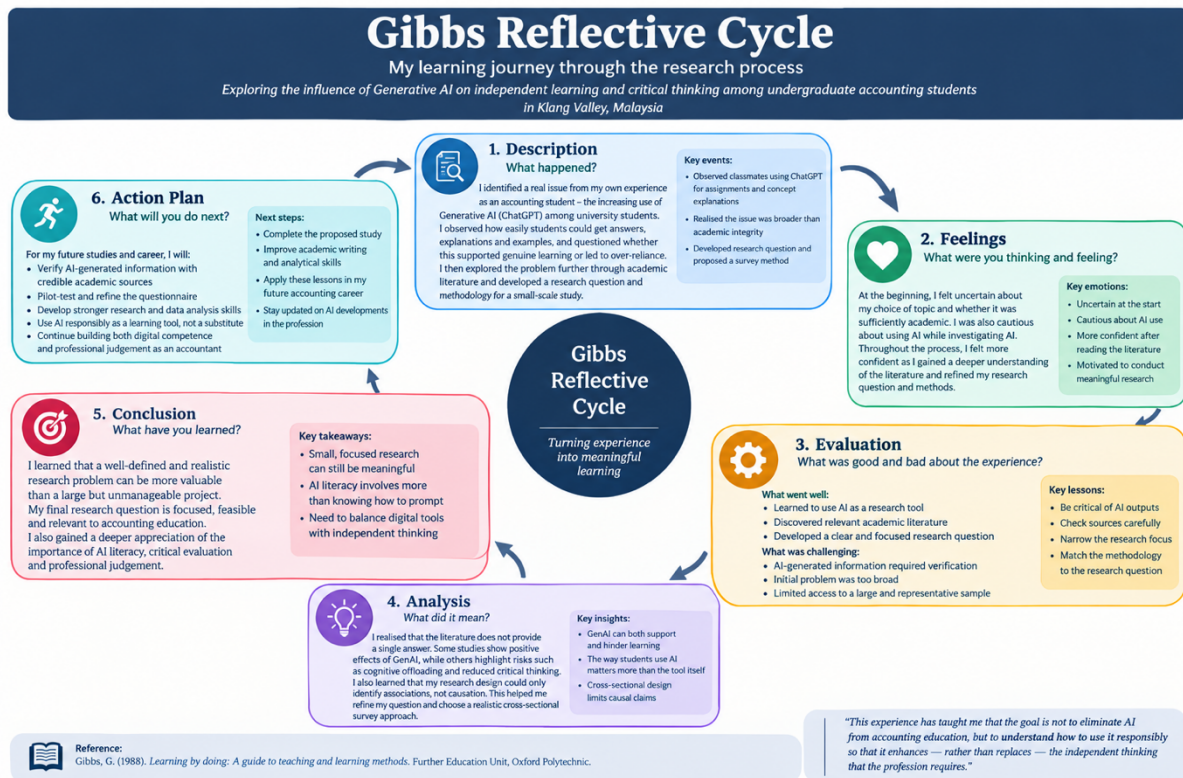
For my future academic and professional development, I intend to adopt a more systematic approach to using AI. I will use AI to generate ideas, explain unfamiliar concepts and challenge my reasoning, but I will verify important information against authoritative sources.

If I conduct the proposed research, I will pilot-test the questionnaire, improve ambiguous questions and ensure that participants understand the purpose of the study. I will also remain cautious when interpreting statistical relationships and avoid making causal claims that the research design cannot support.

Geographically, I have learned that the Klang Valley provides a realistic research setting because I can potentially access undergraduate accounting students through my academic networks. Rather than attempting an unrealistic nationwide study, I can investigate a small local population while clearly acknowledging the limitations of generalisability.

Overall, the portfolio has changed my perspective from seeing AI primarily as a threat to recognising it as a technology that requires responsible and critical use. This is a lesson that I can carry from my academic studies into my future accounting career.

GIBBS REFLECTIVE CYCLE IMAGE



Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Further Education Unit, Oxford Polytechnic.

REFERENCE

Accounting + GenAI

1. Ballantine, J. A., Boyce, G., & Stoner, G. (2024). A critical review of AI in accounting education: Threat and opportunity. *Critical Perspectives on Accounting*, 99, 102711. <https://doi.org/10.1016/j.cpa.2024.102711>
2. Sundkvist, C. H., & Kulset, E. M. (2024). Teaching accounting in the era of ChatGPT – The student perspective. *Journal of Accounting Education*, 69, 100932. <https://doi.org/10.1016/j.jaccedu.2024.100932>
3. Zhou, A., & Luo, Y. (2025). Exploring the impact of generative AI on student learning in accounting. *Journal of Accounting Education*, 72, 100982. <https://doi.org/10.1016/j.jaccedu.2025.100982>
4. *The effects of generative artificial intelligence (GenAI) on learning in an accounting data analytics course.* (2025). *Journal of Accounting Education*, 72, 100987. <https://doi.org/10.1016/j.jaccedu.2025.100987>
5. *Accounting Students' Technology Readiness, Perceptions, and Digital Competence Toward Artificial Intelligence Adoption in Accounting Curricula.* (2025). *Journal of Accounting Education*, 70, 100951. <https://doi.org/10.1016/j.jaccedu.2025.100951>
6. *Bridging AI with cost accounting education: A pedagogical framework using reperformance and critical error review.* (2025). *Journal of Accounting Education*, 72, 100988. <https://doi.org/10.1016/j.jaccedu.2025.100988>
7. Yun, J. J. (2024). ChatGPT and academia on accounting assessments. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(1), 100213. <https://doi.org/10.1016/j.joitmc.2024.100213>

GenAI + higher education

8. Baig, M. I., & Yadegaridehkordi, E. (2024). ChatGPT in the higher education: A systematic literature review and research challenges. *International Journal of Educational Research*, 127, 102411. <https://doi.org/10.1016/j.ijer.2024.102411>
9. Deng, R., Jiang, M., Yu, X., Lu, Y., & Liu, S. (2024). Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies. *Computers & Education*, 208, 105224. <https://doi.org/10.1016/j.compedu.2024.105224>

10. Singh Bhullar, P., Joshi, M., & Chugh, R. (2024). ChatGPT in higher education – A synthesis of the literature and a future research agenda. *Education and Information Technologies*, 29, 21501–21522. <https://doi.org/10.1007/s10639-024-12723-x>
11. Mohebi, L. (2024). Empowering learners with ChatGPT: Insights from a systematic literature exploration. *Discover Education*, 3, 36. <https://doi.org/10.1007/s44217-024-00120-y>
12. Yusuf, A., et al. (2024). Generative AI in education and research: A systematic mapping review. *Review of Education*. <https://doi.org/10.1002/rev3.3489>

Critical thinking / cognitive effects

13. Essien, A., Bukoye, O. T., O'Dea, X., & Kremantzis, M. (2024). The influence of AI text generators on critical thinking skills in UK business schools. *Studies in Higher Education*, 49(5), 865–882. <https://doi.org/10.1080/03075079.2024.2316881>
14. Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: A systematic review. *Smart Learning Environments*, 11, 28. <https://doi.org/10.1186/s40561-024-00316-7>
15. *Generative artificial intelligence impact on critical thinking in higher education: A comprehensive bibliometric analysis and systematic review*. (2026). *Journal of Computers in Education*. <https://doi.org/10.1007/s40692-026-00396-z>
16. *The cognitive impact of ChatGPT in higher education: A systematic review of critical and creative thinking outcomes*. (2026). *Computers and Education: Artificial Intelligence*, 10, 100571. <https://doi.org/10.1016/j.caeai.2026.100571>

Self-regulated learning

17. Ng, D. T. K. (2024). Empowering student self-regulated learning and science education through ChatGPT: A pioneering pilot study. *British Journal of Educational Technology*. <https://doi.org/10.1111/bjet.13454>
18. Lim, L., & Bannert, M. (2026). How do students regulate their learning with a genAI chatbot? *Learning Letters*, 8, 61. <https://doi.org/10.20851/ll.v8.61>

Academic integrity

19. *Generative AI and Academic Integrity in Higher Education: A Systematic Review and Research Agenda*. (2025). *Information*, 16(4), 296. <https://doi.org/10.3390/info16040296>

Research methodology

20. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297–334. <https://doi.org/10.1007/BF02310555>
21. Saunders, M. N. K., Lewis, P., & Thornhill, A. (2023). *Research methods for business students* (9th ed.). Pearson.

22. Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE.
23. Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Oxford Polytechnic.

Presentation Video

