

成果報告

教育部教學實踐研究計畫成果報告

Project Report for MOE Teaching Practice Research Program

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計畫名稱：促進行政學之個人化學習：評估 生成式 AI 輔助學習

**Title of the Project: Personalized Learning in Public Administration:
Evaluating GenAI-assisted Learning**

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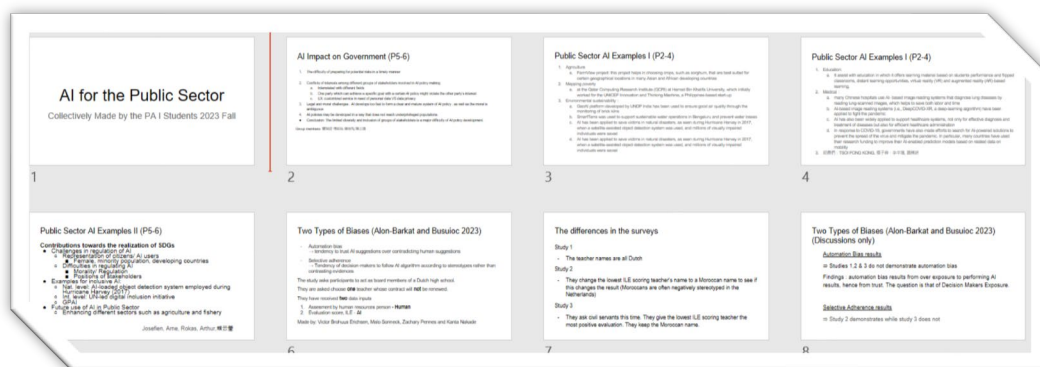
一、本文 (Content)

1. 研究動機與目的 (Research Motive and Purpose) [From the proposal]

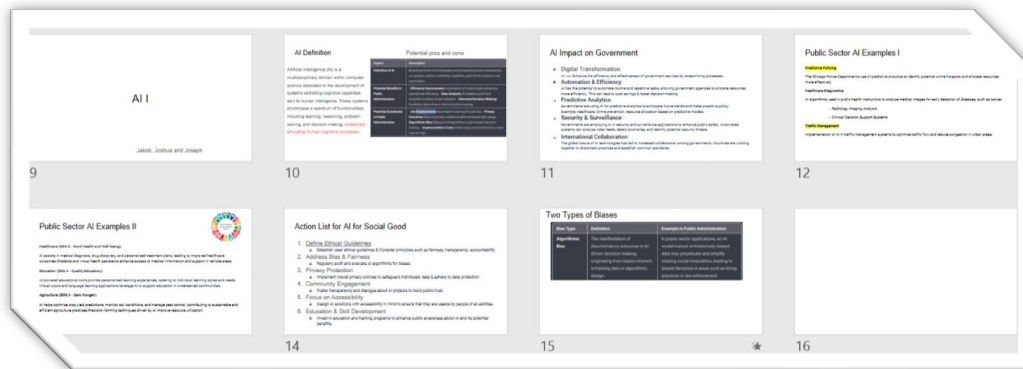
Potentials or Challenges from the Rise of the GenAI-assisted learning tools?

With the rise of generative AI-assisted (GenAI-assisted) learning tools, such as ChatGPT, students increasingly explore the functions of AI to assist their learning. For an introductory class, reading is a critical foundation for students to obtain the necessary knowledge for their pursued professional degree. Thus, the PI has designed activities in the class to teach how to utilize a GenAI-assisted learning tool to facilitate learning and reading for public administration courses.

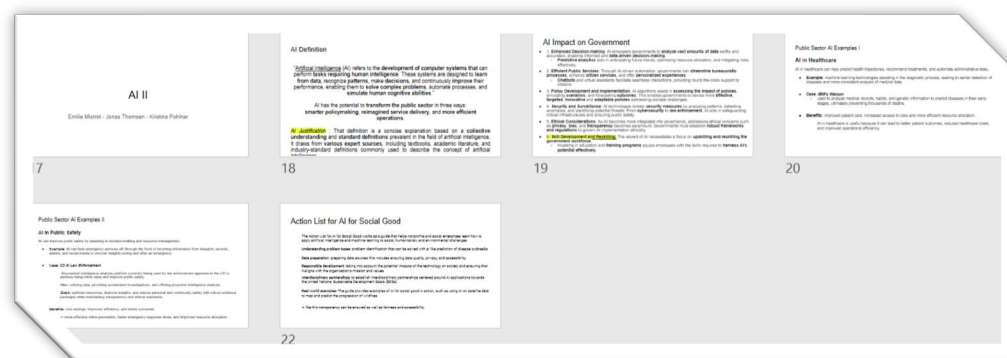
Figure 1 illustrates a competition between outcomes generated by humans and GenAIs. The instructor divided the class into multiple groups; two groups will use GenAI-assisted learning tools, such as ChatGPT, to generate a presentation on AI in the public sector. The rest of the groups were divided into multiple sub-groups and responsible for reading part of the assigned journal articles and making an online PPT collective. The process involves reading briefly, capturing key concepts individually, group discussion, selecting the best description of the critical concepts, deliberation, making an online PPT presentation. Figure 2 presents the discussion outcomes from humans and AIs.



Online PPT Presentation Made by 30 Students Collective after Reading Moon (2023) and Alon-Barkat and Busuioc (2023)



Online PPT Presentation Made by a GenAI-assisted learning tool, ChatGPT



Online PPT Presentation Made by another GenAI-assisted learning tool

Figure 1. A Class Competition between AI vs. Human: A Class Topic of AI in the Public Sector

While such a process is adequate to ensure students obtain the fundamental knowledge in the field, it is essential to incorporate GenAI-assisted learning process into the routine teaching. Therefore, the PI asked the students to answer the following questions: What is the most important thing you learned from this competition? Which group did you learn? In general, two opinions emerged on adopting AI for learning: optimistic and conservative. Some students express their enthusiasm for learning from the information generated by the ChatGPT on AI in the public sector while other students express more conservative views on adopting AI for learning or in the public sector.

2. 研究問題 (Research Question) [From the proposal]

As mentioned earlier, the adoption of the GenAI-assisted learning increased learning motivation (Ali et al., 2023), improve reading behaviors or materials (Baskara 2023; Xiao et al, 2023) and learning outcomes (Baskara 2023; Yilmaz & Yilmaz, 2023). Given these empirical evidences supported from the previous studies on adoption of the GenAI-assisted learning, this study formulates the follow questions:

- How will the GenAI-assisted learning affect students' learning motivation?

- How will the GenAI-assisted learning affect students' reading outcomes?
- How will the GenAI-assisted learning affect students' reading behaviors?
- How will the GenAI-assisted learning affect students' learning outcomes?

3. 文献探討 (Literature Review) [From the proposal]

Personalized Reading Strategies through GenAI-assisted Learning

Increasingly, educational institutions are adopting GenAI-assisted learning tools, such as GhatGPT, Gemini, and Grammarly, to enhance learning and customize the learning process. Laato et al. (2023) show that GenAI-assisted tools offers multiple functions and capacities for learning, including conversational AI, language translation, text generation, code generation, sentiment analysis, summarizing essays and articles, and communication improvement. Table 1 provides the list of functions and capacities of GenAI-assisted learning and their associated cases, organized by Laato et al. (2023).

Table 1. List of functions and capacities of GenAI-assisted learning and cases

Functions/Capacities	Cases
Conversational AI	ChatGPT helps users test their ideas, and reflect upon their thinking through receiving conversational feedback.
Language translation	Users can translate text back and forth from various languages, or simplify text
Text generation	ChatGPT allows users to generate text via prompts.
Code generation	ChatGPT is able to produce programming code in multiple languages
Sentiment analysis	Students can conduct behavioral research more easily on datasets
Summarizing essays and articles	Students can quickly obtain the main points of long articles without the need to get into the details.
Communication Improvement	Students can use ChatGPT to fix the grammar in their writing.

*Table simplified from the Laato et al. (2023).

While the GenAI assisted tool can learn, it is unclear if the students can enhance their learning from those tools. A few studies started to experiment. For instance, Yilmaz & Yilmaz (2023), by adopting an experiment (N=45), show that the students using ChatGPT are associated with higher scores on computational thinking skills, programming self-efficacy, and learning motivation in computational programming class. In particular, they designed an experiment with two groups: a control group with

programming training based on a hands-on coding method vs. an experimental group with programming training based on a hands-on coding method, plus the ChatGPT tool. Then, they include a pre-and post-survey design to assess computational thinking, computer programming self-efficacy, and learning motivation scales. Besides their recommendations for integrating AI-assisted learning tools into the classes, they further argue that teaching students prompt writing skills is essential to use the AI tools effectively. However, given a small sample size, it is different to generalize the findings to the other studies or another field.

Interestingly, through a literature review, Baskara (2023) also reveals a positive correlation between adopting AI-related technologies in language courses and learning outcomes. For instance, adopting ChatGPT in class could provide personalized instruction for students to be engaged in learning (Baskara, 2023) by asking questions to clarifying concepts from the reading or getting a general direction about the key points of the readings. For instance, one can ask the ChatGPT to provide key summary of an article to get the main point of the article or to provide a definition of a key theory.

Furthermore, Ali et al. (2023) show that students utilizing ChatGPT for language learning are associated with higher survey scores on motivation, reading, writing, and various language skills through an online survey. However, Ali et al.'s (2023) study participants are self-selected, and the results might suffer from selection bias (i.e., people interested in ChatGPT are more likely to participate in a ChatGPT online survey). There remains a need for further empirical evidence to establish the effects of GenAI-assisted learning for learning.

Risks and challenges of adoption of GenAI-assisted learning

However, using GenAI-assisted learning may also raise concerns and challenges. One of the biggest challenges is the ethical concerns of using GenAI-assisted tools to generate texts. Concerns and discussions have been raised about rules and guidelines for using GenAI-assisted learning for classes in higher education. For instance, Miao and Holmes (2023) discuss ethical issues (such as human intellectual development, psychological impact, hidden bias, and discrimination), copyright and intellectual property, and sources of content and learning. Therefore, they call for further rethinking of assessment and learning outcomes and the thinking processes in learning in the *Guidance for Generative AI in Education and Research* published by UNESCO (Miao & Holmes, 2023).

4. 教學設計與規劃 (Teaching Planning) [From the proposal]

This research project aims to test the effects of GenAI-assisted learning on students' reading outcomes, reading behaviors, and overall learning outcomes through a pre- and post-survey and a within-subject experiment. "The course's objectives are for students to gain an overview of both issues and practices related to public administration. The course focuses on the environment, values, and core functions of public administration. The course will explore (1) how various government agencies run, (2) the dynamics between government and politics, and (3) relationships between government, market, civil society, and citizens. Additionally, at the end of the course, students will be able to

1. Describe the major theories and content of public administration;
2. Recognize the functions of public administration, such as decision-making, accountability, and performance evaluation in the public sector;
3. Apply different policy tools and frameworks to examine the current public policies and affairs in the local and international context." (See Syllabus)

We conducted a within-subject experiment to examine the effects of GenAI-assisted learning in the Public Administration I and Public Administration II courses (Figure 2). By adopting a within-subject experiment, all students will read the readings from the control group with a regular reading system and the intervention group with a summary of the reading from the GenAI-assisted learning. The analyses will compare the differences between the control and intervention of the same subjects. As the reviewer has pointed out, this way, it will not affect the student's learning rights, especially if ChatGPT gives students learning advantages.

We didn't repeat the experiments due to the potential effects from fatigue as we originally planned. At the beginning of each class, we gave a 60-minute instruction on operating GenAI-assisted learning. NTU COOL is an online web-based learning platform. Our research team informed all the students about the research purposes and procedures at the beginning of each class. Also, we followed the ethical review guidelines and share the consent information with the participating students.

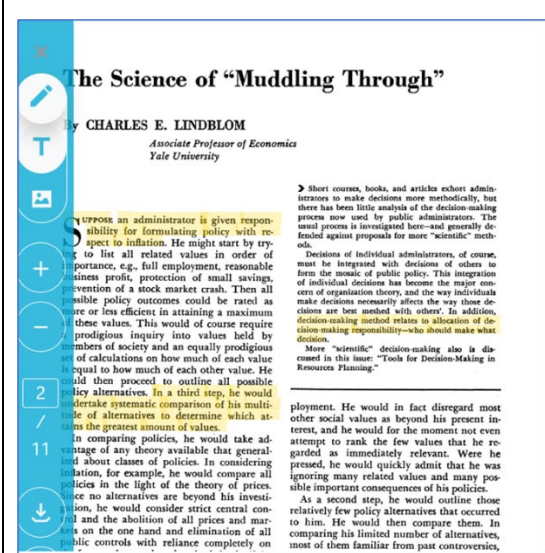
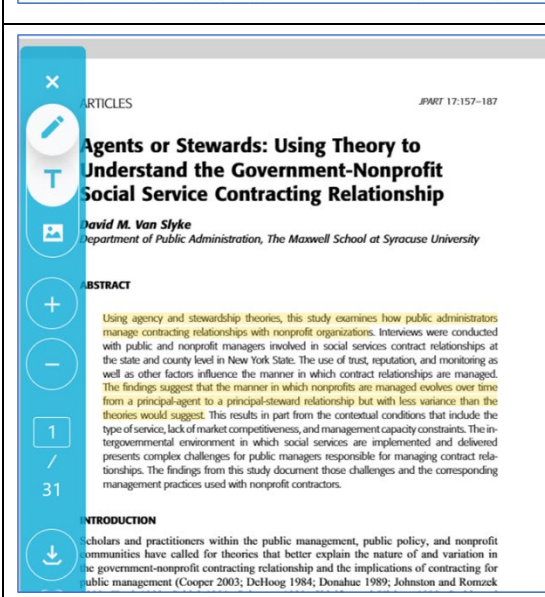
	Quizzes > Reading Test on Lindbloom Question 2 What method does this paper outline? ☐ Garbage Can Model ☐ Successive Limited Comparison ☐ Scenario Planning ☐ Cost-Benefit Analysis	Control Reading Task- Regular Reading System from NTU COOL
	You please summarize stewardship Theory by Van Slyke in Agents or Stewards: Using Theory to Understand the Government-Nonprofit Social Service Contracting Relationship ChatGPT Stewardship Theory, as discussed by David M. Van Slyke in his 2007 article "Agents or Stewards: Using Theory to Understand the Government-Nonprofit Social Service Contracting Relationship," revolves around the idea of stewardship in the context of government and nonprofit relationships. The theory suggests that in certain situations, managers in these relationships are not primarily driven by personal goals. Instead, their actions and decisions are more aligned with the organizational goals and the welfare of the public they serve. This perspective differs from traditional agency theory, which often assumes that individuals are mainly motivated by self-interest. Van Slyke's work applies this theory to understand the dynamics between government entities and nonprofit organizations, particularly in the realm of social service contracting. Quizzes > Reading Test on Van Slyke (2... Question 3 What did the findings of the paper show? ☐ the manner in which nonprofits are managed evolves over time from a principal-agent to a principal-steward relationship but with less variance than the theories would suggest ☐ the manner in which nonprofits are managed evolves over time from a principal-steward to a principal-agent relationship but with less variance than the theories would suggest ☐ Neither agency or stewardship theory are relevant to contract making ☐	Experimental Reading Task- with a summary from a GenAI-assisted learning.

Figure 2. Illustration of the Control and Experiment Groups

5. 研究設計與執行方法 (Research Methodology) [From the proposal]

1. 研究架構

In our study, we implemented a pre-and post-survey to evaluate the impact of GenAI-assisted learning on students' motivation, reading, and learning outcomes. To understand the influence of GenAI-assisted learning on students' motivation, perceived reading, and learning outcomes, we integrated multiple validated survey instruments focusing on reading habits (Kumara & Kumara, 2007) and reading outcomes (Hwang et al., 2007). Portions of this survey have been previously utilized and validated in an MOE project, ensuring their reliability (refer to Appendix I for detailed survey questions).

2. 研究範圍目標

Courses like Public Administration I, designed as introductory modules, provide an ideal setting for evaluating the impact of the GenAI-assisted learning on reading and learning processes. These courses are aimed at helping students acquire basic knowledge in a professional domain. The course syllabus outlines the goal of acquainting students with the core principles and theories of public administration. Given the critical role of reading comprehension in successfully completing these courses, they present a fitting opportunity to assess how the GenAI-assisted learning can influence students' reading proficiency, habits, and overall learning achievements.

3. 研究對象與場域

This study was conducted at National Taiwan University with around 45 undergraduate public administration students (ratio of males to females is around 3:4) enrolled in public administration fundamental course in Fall 2024. Our survey gathered fundamental demographic information, including gender, age, nationality, primary and secondary languages, academic majors, and other vital background characteristics, to serve as control variables. Participation in the survey is voluntary.

4. 研究方法與工具

Pre- and post-survey to assess GenAI-assisted learning

To assess the adoption of a GenAI-assisted learning, this study adopted multiple survey instruments on reading habits (Kumara & Kumara, 2007) and reading (Hwang et al., 2007). Parts of the survey instrument have also been adopted and tested when examining the annotation learning system from 2022-2023. Specifically, we included parts of the previous survey instrument from Kumara & Kumara (2007) because they capture the fundamental questions on reading habits and behaviors. Furthermore, we include and modify parts of the previous survey instrument from Hwang et al. (2007) because their assessment includes questionnaires to measure experiences from the online reading and a self-assessment of the system's usefulness. In conclusion, the measurements include reading habits, reading abilities, the purpose of reading, GenAI-assisted learning evaluation, perceived usefulness, comparison, and basic information. Also, we will include an open-ended question, "In this section, tell us what improvements we can make?" Appendix I includes the proposed survey instruments.

Furthermore, in the section for evaluating the GenAI-assisted learning, we follow the *Reading Cognitive Level*, modified by Yang et al. 2013 (See Figure 3), including *Remember, Understand, Apply, Analyze, Summarize, and Evaluate*. Including

those questions would help us distinguish between surface learning (*remember, understand, apply*) and deep learning (*analyze, summarize, and evaluate*).

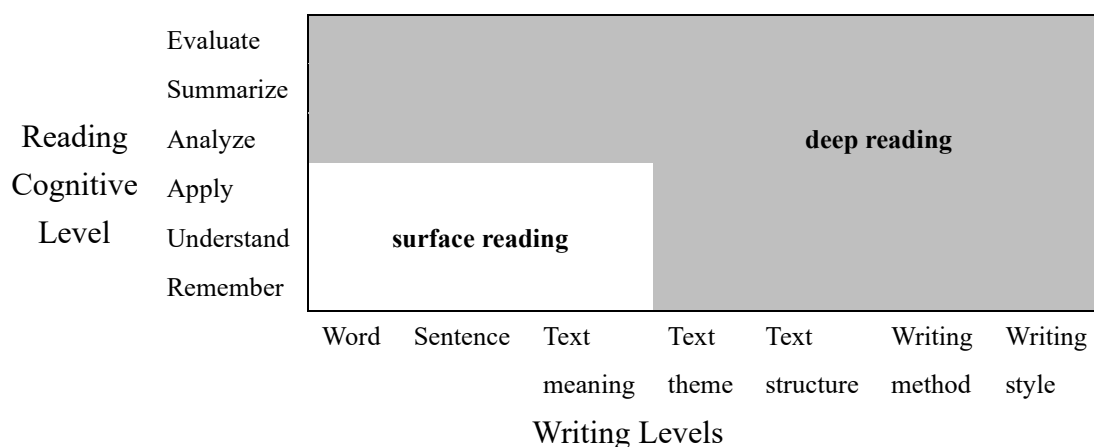


Figure 3. Reflection of Reading Levels on Writing Levels (modified by Yang et al. 2013).

5. 研究實施程序

Table 2: Key Project Implementation Activity and Schedule for A Semester

Assessment of the GenAI-assisted Learning on Reading		
<i>Description of Activity</i>	<i>Location</i>	<i>Duration</i>
Design	office	4 weeks
Attend a technical workshop on the GenAI-assisted learning	classroom	1 week
Conduct pre-survey (N= 45 students)	classroom	1 week
Implement experiment/the GenAI-assisted learning tools	Virtual platform; classroom; home	12 weeks
Conduct post-survey (N= 45 students)	classroom	1 week
Reflective memos on using the GenAI-assisted learning	classroom	1 week
Data coding and analysis	office	4 weeks
Summarize the knowledge gained from classroom learning, field visit, and survey, experiment outcomes, along with students' personal reflections, into a comprehensive project report and journal article.	office	4 weeks

6. 教學暨研究成果 (Teaching and Research Outcomes)

(1) 教學過程與成果

Adoption of the GenAI-assisted learning for Public Administration Learning

Building on previous studies (Yilmaz & Yilmaz, 2023), we will adopt the GenAI-assisted learning for reading and learning public administration. We will adopt both subjective and objective learning assessments. We adopted Hwang et al.'s (2007) and Yang et al.'s (2013) survey instruments to evaluate reading performance, reading behaviors, and learning outcomes for subjective evaluation. For objective evaluation, we will compare the outcomes of quizzes and exams from the control and intervention groups of the experiments.

Surprisingly, as shown in Table 3, after the AI reading assistant treatment, students became more doubt on the idea that generative artificial intelligence can enhance motivation and help with the ability of applying concepts from the reading, critical evaluating the readings, improving reading speed without sacrificing comprehension of public administration materials and connecting the concepts from public administration readings with other related disciplines. However, none of the differences between the two surveys is statistically significant (Table 3), which might be due to the small sample size.

Additionally, with the average score just below 4 in both pre- and post-surveys, students were more likely to agree with the opinion that generative artificial intelligence helps them to understand and summarize the reading, and that they will continue to use it as assistance when reading. On the contrary, students were more opposed to the idea that generative artificial intelligence can enhance their ability to critically evaluate arguments in public administration literature, with the average score around 3 in both tests. Again, none of the differences between the two surveys is statistically significant.

Pre and Post (Average)

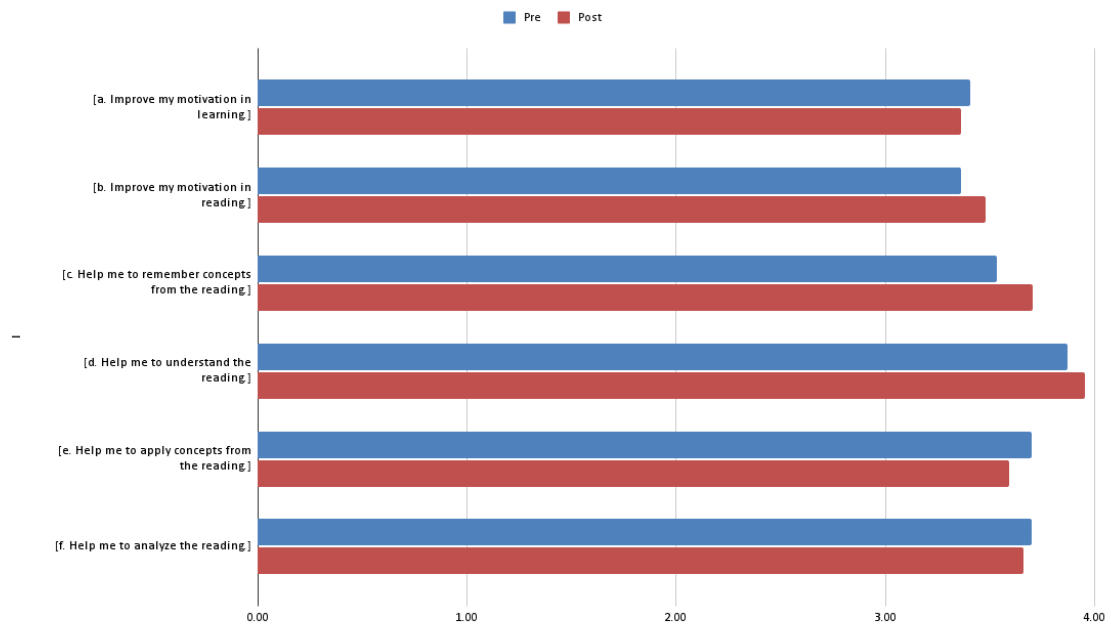


Figure 4. GenAI-assisted learning

Pre and Post (Average)

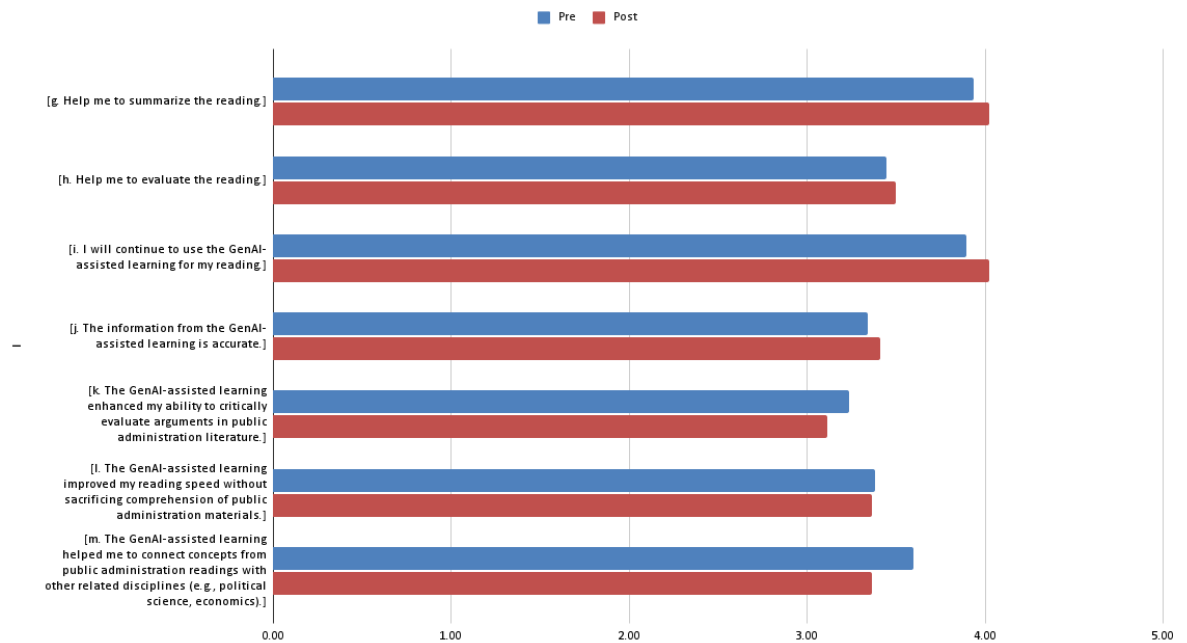


Figure 5. GenAI-assisted learning

Perceived Usefulness of Generative Artificial Intelligence

In the next section of the survey, we aimed to understand the usefulness of generative artificial intelligence (Figure 6). Generally speaking, all the differences between the pre- and post- surveys are not statistically significant (Table 4). Furthermore, according to the decreased figure on post survey, students became more opposed to the view that generative artificial intelligence is easy to use, easy to add contents to and can improve the expansion of knowledge, while other questions had higher scores on the post-survey than on the pre-survey. Interestingly, students tend to disagree with the opinion that generative AI can promote teamwork, which score below 3 in the pre-survey and still remain the least in the post-survey.

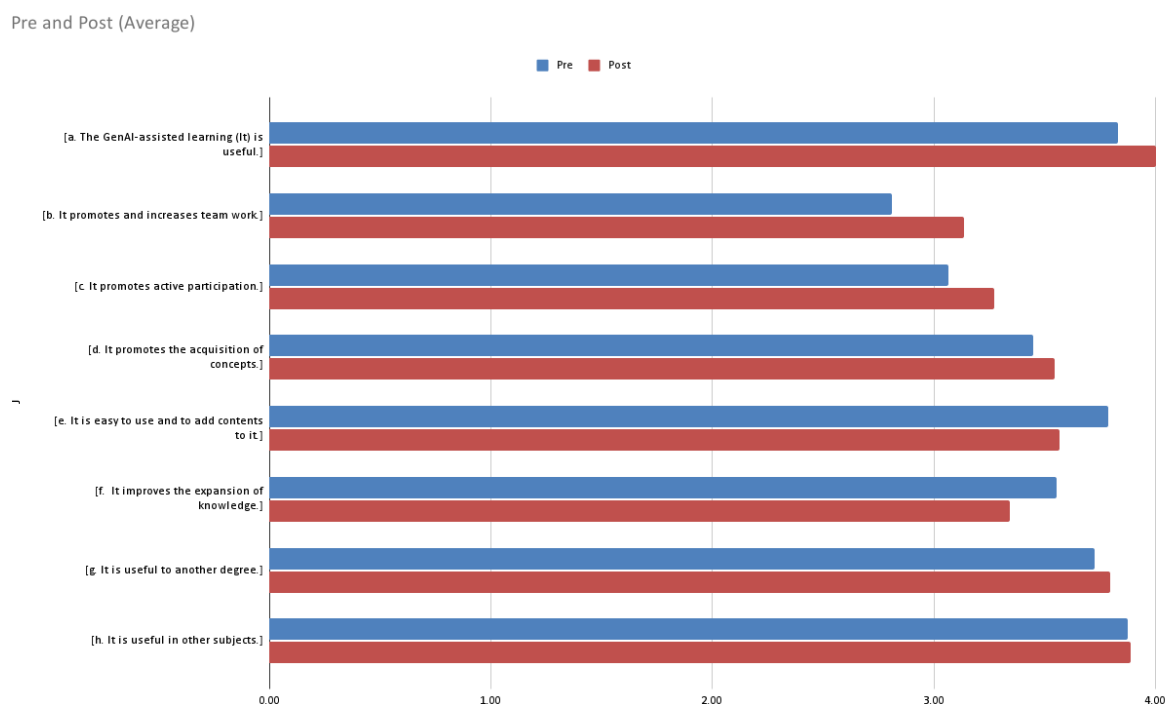


Figure 6. Perceived Usefulness

To assess the students' awareness of generative AI, we asked the students whether they understood the principles and the knowledge of generative artificial intelligence (Figure 7). Overall, the average scores are higher in the post study than those of pre study. Notably, the table shows that students gained a better understanding of the basic principles, potential applications, and ethical considerations, with statistically significant variations of 0.32, 0.37, and 0.59 points, respectively, after the treatment (Table 4). Although the post-test scores are higher, the differences are not statistically significant, and the average scores in the pre-test are even below 3 for the opinion that students are able to differentiate between various types of generative AI models and explain how generative AI generates text or images. This indicates that, in general, students did not agree with this view.

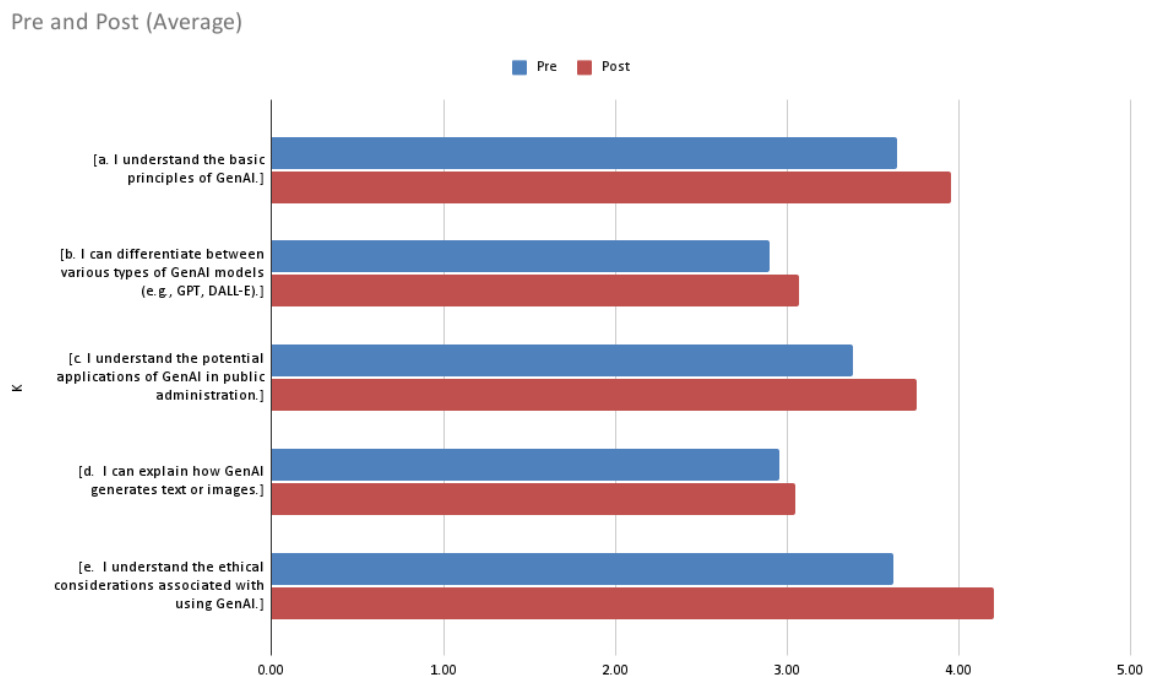


Figure 7. Awareness of GenAI

In this section, we examine students' cognitive attitude towards generative artificial intelligence (Figure 8). In general, students agree more with the survey questions except for the idea that GenAI can significantly enhance their learning efficiency, which barely changed between the two surveys. Moreover, except for the mentioned idea, the variations of other questions are statistically significant (Table 4). According to the table, students have shown greater agreement on the idea that generative AI is dangerous the probability of being over-reliance and potential privacy issues. Nevertheless, they tended to affirm more that generative AI can bring revolutionary changes to public administration and learning how to effectively use GenAI is an essential skill for future workplaces at the same time.

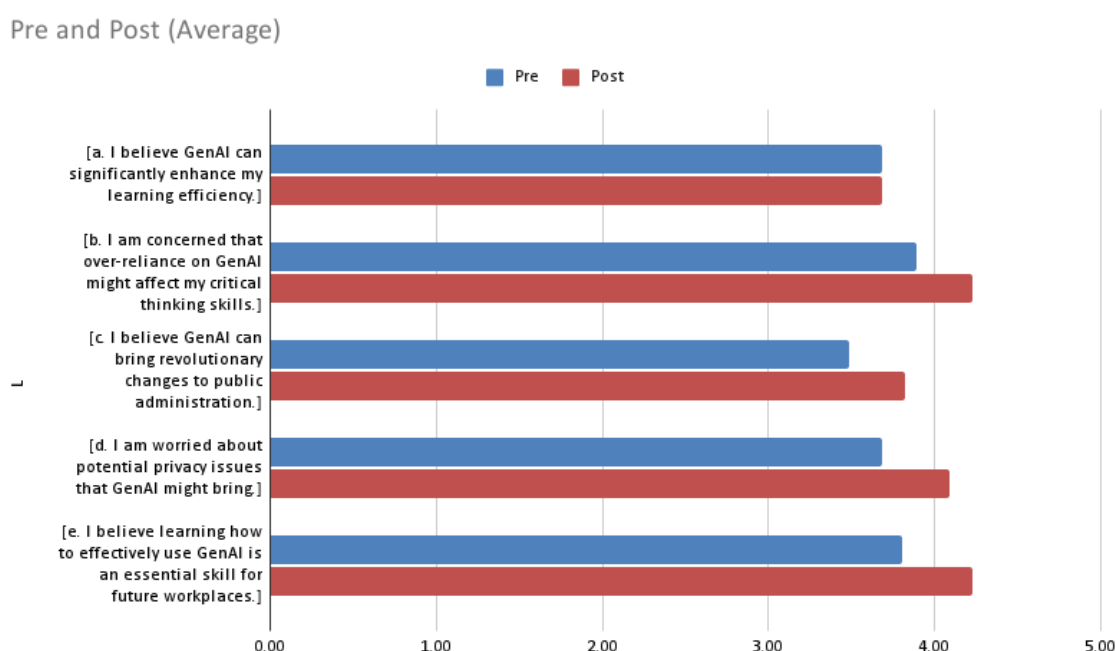


Figure 8. Cognitive attitude towards GenAI

Improvement of Reading in Public Administration Fundamental Classes

Building on Yilmaz and Yilmaz (2023), we expect students to increase their reading and learning outcomes. As suggested by our hypotheses, there will be increases in students' comprehension of reading English languages, an increase in students' motivation in reading, an increase in students' learning outcomes, yet a decrease in students' preparation time for the class when using the GenAI-assisted learning. Furthermore, through this adoption, we will also develop a guideline for effectively utilizing the GenAI-assisted learning to improve reading and comprehension, especially for articles in English.

According to Figure 10, with the average score of more than or around 3.5 in both pre- and post- test, the participants generally agreed that they would like to spend time reading and peer interactions did help them with resolving the questions. The question "I like to read because it is novel and interesting through the NTU COOL" achieved the lowest score in this section, which indicates the negative attitude toward NTU COOL. Lastly, the majority of participants agreed that they read for school-related purposes, such as exams and taking notes, based on Figure 10. The average scores for these reasons were approximately 1 point higher than those for reading as a hobby or for learning new vocabularies. Remarkably, even though the figures are slightly different between pre and post- test, the differences are not statistically significant in these two sections (Table 5).

Pre and Post (Average)

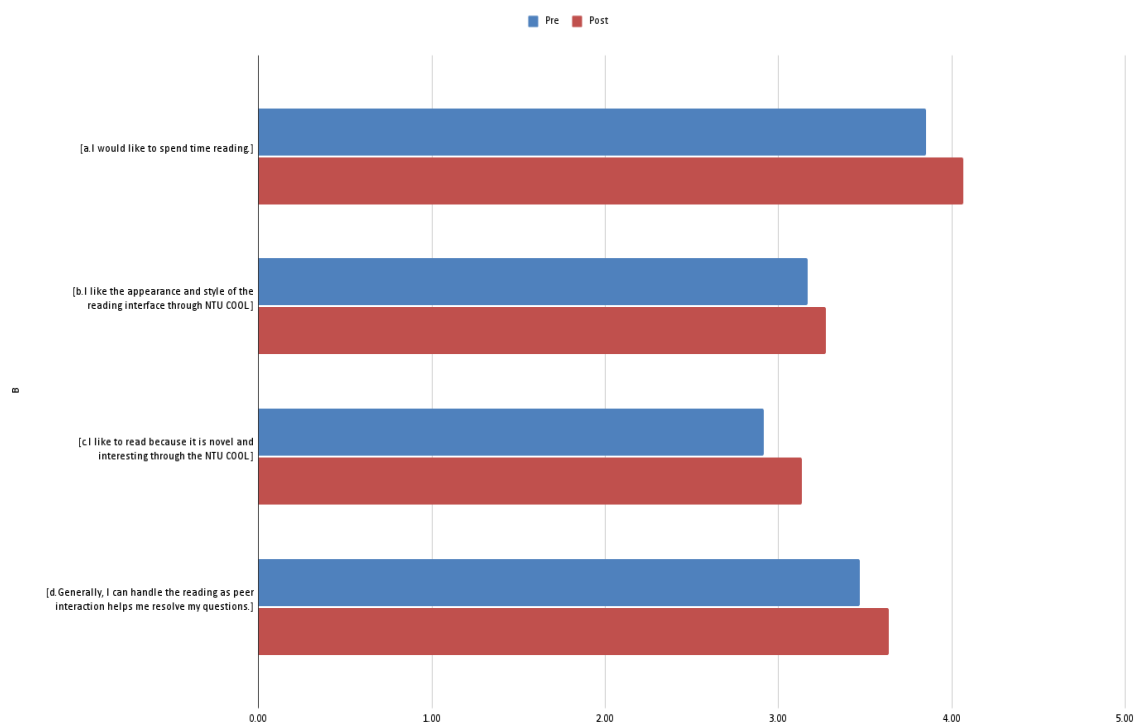


Figure 9. Reading Abilities

Pre and Post (Average)

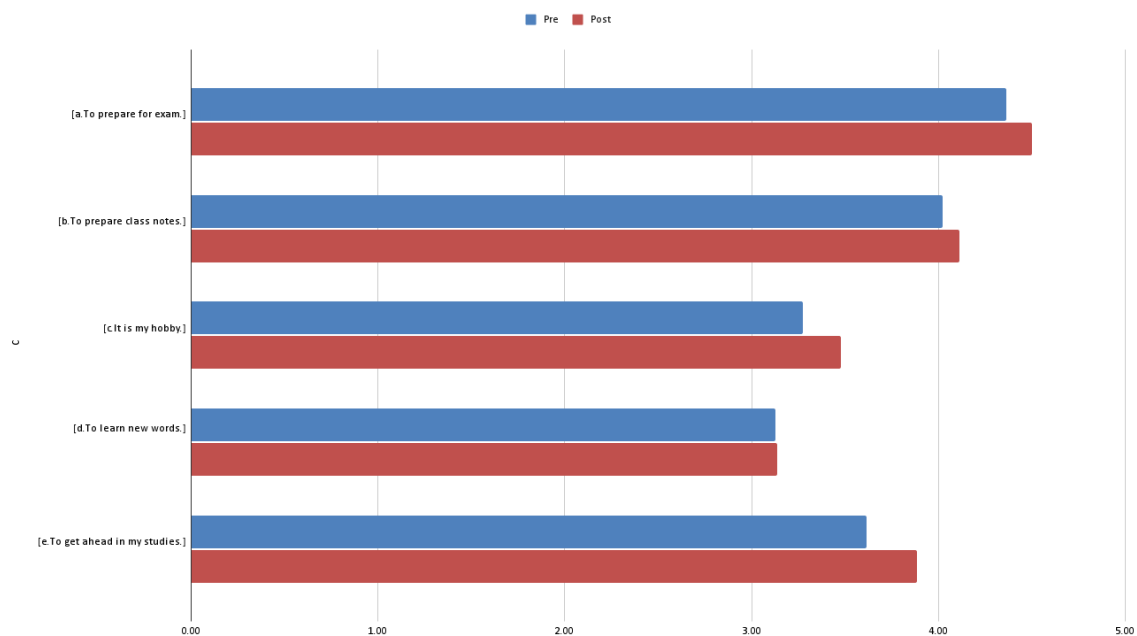


Figure 10. Purpose of Reading

(2) 教師教學反思

Curricular and Time Constraints

We did not repeat the experiments ten times as proposed because of the time constraints. The PA fundamental courses include a large volume of core content. The instructor faced challenges of allocating sufficient time for the teaching materials and the experiment. Therefore, we were able to implement one experiment. This forced difficult trade-offs between experimental fidelity and ensuring students receive complete PA education.

Experiment Measurements

Inclusion of Measuring the Core Knowledge: The questionnaire we administered did not include items to assess whether students had learned the fundamental PA concepts taught in the course. For future studies, one should include objective measurements. Improvement of Assessment Tools: Relying on take-home papers for mid-term and final evaluations proved inadequate for testing foundational knowledge. Future studies could consider including a precise, objective measure of students' understanding of core material.

(3) 學生學習回饋

Table 6 presents students' comments and feedback on using AI for improving PA reading.

7. 建議與省思 (Recommendations and Reflections)

Al-Zahrani (2024) shows that students increasingly rely on AI for obtaining educational information without engaging in reading or class, which might then reduce students' critical thinking skills and result in the obtaining of misleading information. Although AI has the potential to enhance education as discussed in our literature review, our preliminary findings suggest a negative or insignificant difference in pre- and post-survey scores in our evaluation of using ChatGPT for reading comprehension improvement (N=45). Survey scores from the pre- and post-surveys of AI assessment were negative in six out of thirteen questions (Appendix Table 3). The significantly positive differences in GenAI awareness, ethical considerations, worries in use for education, and future workplace usages indicate GenAI's importance (See Appendix Table 4). These findings might indicate that AI may not effectively enhance deep learning and knowledge retention. Our findings raise critical questions about the role of AI and need for new AI design in education.

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三、附件 (Appendix)

A. Reading Habits

- a. Please indicate the weekly reading hours for this class? ____Hours
- b. Please indicate the weekly reading hours outside this class? ____Hours
- c. Please indicate the weekly hours of internet usages (including social media)? ____Hours

B. Reading Abilities

(Strongly Agree/ Agree/ Neutral/Disagree/ Strongly Disagree)

- a. I would like to spend time reading.
- b. I like the appearance and style of the reading interface through NTU COOL.
- c. I like to read because it is novel and interesting through the NTU COOL.
- d. Generally, I can handle the reading as peer interaction helps me resolve my questions.

C. Purpose of Reading

(Strongly Agree/ Agree/ Neutral/Disagree/ Strongly Disagree)

- a. To prepare for exam.
- b. To prepare class notes.
- c. It is my hobby.
- d. To learn new words.
- e. To get ahead in my studies.

D. The GenAI-assisted learning

(Same as Above)

- a. The GenAI-assisted learning did improve my motivation in learning.
- b. The GenAI-assisted learning did improve my motivation in reading.
- c. The GenAI-assisted learning did help me to remember concepts from the reading.
- d. The GenAI-assisted learning did help me to

understand the reading.

- e. The GenAI-assisted learning did help me to apply concepts from the reading.
- f. The GenAI-assisted learning did help me to analyze the reading.
- g. The GenAI-assisted learning did help me to summarize the reading.
- f. The GenAI-assisted learning did help me to evaluate the reading.
- i. I will continue to use the GenAI-assisted learning for my reading.
- j. The information from the GenAI-assisted learning is accurate.
- k. The information from the GenAI-assisted learning is accurate.

E. Perceived Usefulness (Same as Above)

- a. The GenAI-assisted learning (It) is useful.
- b. It promotes and increases the team work.
- c. It promotes the active participation.
- d. It promotes the acquisition of concepts.
- e. It is easy to use and to add contents to it.
- f. It improves the expansion of knowledge.
- g. It is useful in other degree.
- h. It is useful in other subjects.

F. Comparisons

(Same as Above)

- a. I can access any related knowledge.
- b. I get maximum information on any subject.
- c. Locating and searching is very easy.
- d. I can prepare notes more effectively.
- e. I can get information with more speed.

G. Basic Information (omitted here)

In this section, tell us what improvements we can make?

Table 3. T-test Result for GenAI-assisted learning

Questionnaire	Pre-test & post- test	90% confidence interval		p- value
comparison	lower bound	upper bound		
I. The GenAI-assisted learning				
a. Improve my motivation in learning..	-0.04	-0.325	0.406	0.826
b. Improve my motivation in reading.	0.12	-0.486	0.255	0.537
c. Help me to remember concepts from the reading.	0.17	-0.530	0.185	0.340
d. Help me to understand the reading.	0.08	-0.460	0.295	0.666
e. Help me to apply concepts from the reading.	-0.11	-0.304	0.526	0.595
f. Help me to analyze the reading.	-0.04	-0.388	0.474	0.843
g. Help me to summarize the reading.	0.09	-0.497	0.324	0.676
h. Help me to evaluate the reading.	0.05	-0.458	0.352	0.795
i. I will continue to use the GenAI-assisted learning for my reading.	0.13	-0.510	0.252	0.503
j. The information from the GenAI-assisted learning is accurate.	0.07	-0.386	0.248	0.668
k. The GenAI-assisted learning enhanced my ability to critically evaluate arguments in public administration literature.	-0.12	-0.311	0.552	0.581
l. The GenAI-assisted learning improved my reading speed without sacrificing comprehension of public administration materials.	-0.02	-0.379	0.417	0.923
m. The GenAI-assisted learning helped me to connect concepts from public administration readings with other related disciplines (e.g., political science, economics).	-0.23	-0.155	0.619	0.236

*p > 1, **p < .05, ***p < .01, +p < 0.15

Table 4. T-test Result for Perceived Usefulness for GenAI, Awareness of GenAI and Cognitive attitude towards GenAI

Questionnaire	Pre-test & post-test comparison	90% confidence interval		p-value
		lower bound	upper bound	
J. Perceived Usefulness				
a. The GenAI-assisted learning (It) is useful.	0.17	-0.538	0.198	.360
b. It promotes and increases team work.	0.33	-0.778	0.123	.151
c. It promotes active participation.	0.21	-0.625	0.207	.321
d. It promotes the acquisition of concepts.	0.10	-0.526	0.328	.647
e. It is easy to use and to add contents to it.	-0.22	-0.196	0.634	.297
f. It improves the expansion of knowledge.	-0.21	-0.254	0.679	.368
g. It is useful to another degree.	0.07	-0.441	0.297	.699
h. It is useful in other subjects.	0.01	-0.380	0.352	.940
K. Awareness of GenAI				
a. I understand the basic principles of GenAI.	0.32	-0.611	-0.021	.036**
b. I can differentiate between various types of GenAI models (e.g., GPT, DALL-E).	0.17	-0.573	0.224	.386
c. I understand the potential applications of GenAI in public administration.	0.37	-0.664	-0.070	.016**
d. I can explain how GenAI generates text or images.	0.09	-0.489	0.313	.664
e. I understand the ethical considerations associated with using GenAI.	0.59	-0.888	-0.287	.000***
L. Cognitive attitude towards GenAI				
a. I believe GenAI can significantly enhance my learning efficiency.	0.00	-0.391	0.389	.996
b. I am concerned that over-reliance on GenAI might affect my critical thinking skills.	0.33	-0.729	0.062	.097*
c. I believe GenAI can bring revolutionary changes to public administration.	0.33	-0.667	0.010	.057*

d. I am worried about potential privacy issues that GenAI might bring.	0.41	-0.750	-0.070	.019**
e. I believe learning how to effectively use GenAI is an essential skill for future workplaces.	0.42	-0.774	-0.064	.021**

*p > 1, **p < .05, ***p < .01, +p < 0.15

Table 5. T-test Result for Reading Abilities and Purpose of Reading

Questionnaire	Pre-test & post-test comparison	90% confidence interval		p-value
		lower bound	upper bound	
B. Reading Abilities				
a. I would like to spend time reading.	0.22	-0.603	0.169	.267
b. I like the appearance and style of the reading interface through NTU COOL.	0.10	-0.505	0.300	.614
c. I like to read because it is novel and interesting through the NTU COOL.	0.22	-0.599	0.156	.246
d. Generally, I can handle the reading as peer interaction helps me resolve my questions.	0.17	-0.542	0.205	.373
C. Purpose of Reading				
	0.14	-0.441	0.165	.367
a. To prepare for exam.	0.09	-0.402	0.218	.555
b. To prepare class notes.	0.20	-0.634	0.233	.360
c. It is my hobby.	0.01	-0.466	0.448	.970
d. To learn new words.	0.27	-0.651	0.113	.165
e. To get ahead in my studies.				

*p > 1, **p < .05, ***p < .01, +p < 0.15

Table 6. Suggestions on Using AI for PA Reading from Students

Comments	Comments
ChatGPT's ability to search for information is terrible, but it analyzes and summarizes a given context well.	it's hard to say, I think learning how to write prompts is very important, that way the probability that info produced by AI is correct, is higher
I think AI can be useful as something that generates debates, like when you write down your thoughts in AI, it can respond you with the opposite aspects you didn't think about.	AI may helps us to read faster than before, but it is still not perfect enough and can be biased. We should make a carefully use of it, and keep training our critical thinking of the text we read, even the tool we use to help us understand the text, like GenAI.
Using with critical thinking	try to ask the right question
Using AI to summarize article and share comments with peer	Not relying only on AI to continue to develop one's skills
Must be limited in use, overreliance will erode students ability to think critically for themselves.	I dont like to use AI for my readings but it is often more usful if you dont know a specific question but need general impact
Must be a complementary tool beside intellectual effort, curiosity and hard working. It shall not replace these values.	I would not recomend using AI for learning considering the AI capacity in todays world
It can be more convenient for disabled people	The platform is a little difficult to use.
While the summary was sufficient in addressing the key points of the reading, it did not go into detail regarding those concepts which could potentially lead to the loss/confusion of the main points of the article. Though I do believe this is a helpful function, I suggest that summaries like those shared on NTU Cool be used only for revision, and not as a replacement for reading the actual article itself.	AI can be used to summarize papers and quickly give an overview on if the paper is in general of interest for learning or research. It can not replace the process of actually reading the significant papers though.
we can add AI bot	AI would be better if it cites where it gets information from
In my opinion, policies to ensure equal access to AI in education should be adopted in order to decrease the digital divide among children	AI is a very useful tool for learning. It can help me translate English to Chinese and vice versa.
1. use it as a reference but be careful about the	Because the information is not always accurate,

conclusion it provides. 2. use clear prompts. 3. keep thinking critically.	double checking is a priority to make sure the information is correct when using GenAI.
Being able to target individual needs is a great feat of AI. It could, for example, generate reading quizzes for students to individually check their understanding before coming to class or taking a test.	I think AI can provide help to have clear main ideas of a reading but cannot assess precisely the main issues, paradoxes and complexities of the reading.
More oral exams to check if people are writing their papers just with GenAI	
To make it accessible on different devices	to learn in a words we want and understand
I suppose AI can list key points for the summary.	Dont full rely on AI and you have to fact-check what AI told you
By using AI tools we can make automated grading and feedback system to help our learning more effective. For example, AI can automate the grading of assignments and exams, especially for multiple-choice or short-answer questions. This can save teachers time, allowing them to focus more on interactive learning, and also, student can use for their self study.	In my experience, using AI has always led to abusive practices. Especially in teamwork, when most people choose to use AI to write their work as a whole instead of thinking and looking for information, it deeply affects discussions and debate during the process of making the presentation as well as the quality of the answers during it. I would therefore simply not discourage using it, and regulate it for assignments.
It can be as a reference other than the lecturer, but the students should not rely on AI to finish their assignment	AI should be implemented for studying, as it can increase learning efficiency, but it is important to realise the risks and potential biases of AI.