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Harnessing AI in Language Learning: Student Purposes and Metacognitive Strategies in a Malaysian University

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Abstract: Artificial Intelligence (AI) has become a household name. In education, the use of AI is being debated on the extent AI should be allowed to be integrated in the academic world. In language learning, some may argue that AI if applied wisely can lead to enhanced understanding of reading text and assisted writing process but at the same time lacks originality. However, using AI, especially among students, requires them to be critical and aware of the existence of bias and inaccuracy of information gained. Hence, this study is aimed to identify the purpose of language students using AI and the use of metacognitive strategies when using AI. The study also further seeks to identify the relationship among the identified strategies. A total of 241 respondents from an English Language undergraduate programme of a local university in Malaysia participated in the study by answering a survey. It was found that the main purpose of using AI is to complete their assignments in terms of brainstorming. The main metacognitive strategy was '*Searching other references*.' There was also no significant difference among the metacognitive strategies used and between male and female students. This study highlights the importance of strategy awareness among the students so that they can harness the benefits of using AI in their everyday academic life.

Keywords: Artificial intelligence (AI), educational support systems, metacognitive strategies, online language learning

Introduction

Artificial Intelligence (AI) is here and now whether we are ready for it or not. In 2017, it was said that by the 2020s, AI would be very much integrated into our lives so seamlessly that we would not realize it is there (Campbell, 2023). True enough nowadays, ever since the invention of the Turing Test, AI is part of our lives. In the future, AI will be a major part of the digital workplace as productivity increases (Razali, Nor & Bashirun, 2024). AI is defined as a transformative technology that can simulate or mimic human intelligence (Russell & Norvig, 2020; IBM, 2024, August 16). As educators, there is a concern to the extent of how much AI should be allowed to be utilized in teaching and learning. There is a concern that

students using AI will make them less creative or critical in the sense that they do not use their decision-making cognitive processes to reach solutions or answers (Ahmad et al., 2023). In short, there is fear that students will be too dependent on AI. Selelo (2023) suggested that within the educational support systems a clear pedagogical approach that integrates critical thinking strategies for fact checking are required in learning settings and teaching curricula.

Another issue with using AI is where do you draw the line of plagiarism? Plagiarism means the act of copying another person's work without consent. This is one of the major issues among students and academics. Other challenges such as the potential bias in the output, the need for continuous human oversight, and the potential for misuse are not unique to the application of AI in education. However, if handled sensibly, these challenges can offer opportunities in education scenarios. Students need to become acquainted with potential societal and cultural biases and risks of AI applications (Selelo, 2023; Roe et al., 2023). Roe et al. (2023) in reviewing AI assisted writing tools recommended more research to be done in order to investigate the ramifications towards education policies. There is a wide array of AI tools that are easily available if applied wisely in the context of education and may benefit all aspects of education like assessment, research and curriculum development.

In language learning, AI is found to be useful in speaking and writing. For instance, Siri and Alexa help to answer questions and even pronounce words in English. Corrective tools like Grammarly and Quillbot were found to be most popular in learning writing skills (Woo & Choi, 2021; Roe et al, 2023). ChatGPT and Perplexity help students and researchers to source information on any given topic and enhance their writing output (Kasneci, 2023). However, the question remains on reading skills using AI. AI such as Perplexity for example is able to "read" for readers in order to find and synthesize information from various articles. Though this is time saving and efficient, at what expense. Are students able to simulate the same process without AI? Reading is an interactive cognitive process (Anderson & Pearson, 1984; Carrell, Devine & Eskey, 1988; Nuttal, 1996). One needs to link or activate his background knowledge or schemata to understand a particular text. In order to further analyse the text, one needs to employ several reading strategies simultaneously. An effective reader is able to execute these strategies effectively, at any given time or with a given text. To self-regulate and monitor oneself ensures deeper comprehension (Flavell, 1979; O'Malley & Chamot, 1990). Research has been done on reading online and metacognitive strategies, however, with the surge of AI application in the academic world, the reading process should be revisited (Anderson, 2002; Ramli et al., 2011; Jusoh & Abdullah, 2015; Ahmadian & Pasand, 2017; Darwish 2017; Rajab 2017; Mohd Ramli, 2021; Rianto, 2022).

Nonetheless, the lack of information on the uses of AI in other language skills, namely reading, the review of previous articles concerns its use in speaking and listening. Presently, there is a lack of comprehensive reviews on available AI-based language learning tools and the pedagogical effects and learner perceptions of these tools. Existing reviews related to AI in language learning have focused on a specific type of AI-based tool or the overall impact of AI on the future of language education.

The objective of the present study is to investigate ESL students' purpose and the extent of using AI and their metacognitive reading strategies. Therefore, the research questions are as follows:

i. What is the main purpose of using AI?
ii. What are the metacognitive reading strategies used while reading responses from AI?
iii. Is there a significant relationship among the metacognitive reading strategies used while reading responses from AI?
iv. Is there a significant relationship between male and female students' use of metacognitive reading strategies while reading responses from AI?

Literature Review

AI and Language Learning

AI has become integral in language teaching and learning due to its various benefits. The use of AI in language learning can be traced back to the work of Intelligent Tutoring Systems (ITS) in the 1980s during the hype of personalized education (Kannan & Munday, 2018). In fact, official reviews on the use of AI have been done by Stanford University in a "100-year report on AI" in 2016 that investigated eight factors related to AI that includes education (Stone et. al, 2016). It was reported that AI showed great promise for language learning provided that it has the capabilities to personalize learning and mimic natural language acquisition. Since then, AI technology has developed significantly, especially in language learning. One of the advantages of AI in language learning is immediate feedback (Kite-Powell, 2017).. With AI-powered tools, learners receive immediate corrections and suggestions that accelerate the learning process as learners improve in real time (Campbell, 2023).

A recent review on types of AI tools for language learning and teaching by Woo and Choi (2021) reported that Speaking and Listening are the most developed AI tools. Speaking is better improved with the assistance of AI. Through personalized practices and simulated conversations, language students are exposed to an unlimited repertoire of interactive scenarios. Language learners are able to monitor and evaluate their speaking progress (Kite-Powell, 2017). Among popular AI used for practising speaking is Siri and Alexa. Both AI tools use voice commands for information searching or performing online tasks. Speakers will need to repeat and restructure their speeches to formulate specific commands. They depend on AI natural language processing to receive commands; thus, the commands need to be clear to get the desired outcome. As for linguistic researchers, Ali (2020) found that these AI platforms enable the researchers to identify the linguistic coping strategies of language learners. Learning language in an AI environment allows learners to feel secure as they receive not just immediate but also constructive feedback. Other AI platforms serve as corrective tools like Grammarly and Quillbot. These corrective tools allow language learners to self-correct and reflect on their writing. They were found most popular in learning writing skills as they can be independent language learners (Woo & Choi, 2021). Other AIs like ChatGPT and Perplexity help students and researchers to source information on any given topic and enhance their writing output. These AI tools help learners to browse and make decisions on the path of their search. The language input from the learner feeds to the database and repertoire of knowledge in AI. Hence, AI in psycholinguistics is important as it can be programmed to analyze the natural language processes in humans and assist in making communication more efficient (Ali, 2020). Thus, AI has evolved tremendously in language learning and apparently constant improvements were made to meet the demands of the sophisticated users.

Overview of the Reading Process and Metacognitive Strategies

Reading process is a cognitive activity. It involves mainly the readers' prior knowledge and their perception of the world (Carrell, Devine & Eskey, 1988; Nuttall, 1996). A person's learning or perception is shaped through his interactions with people and his environment (Vygotsky, 1997). Thus, comprehension of text is achieved once the information that he perceives from a text is linked to his prior or background knowledge (Bernhardt, 1991; Nuttall, 1996). To read effectively, the reader needs to interpret or to decode the message or the purpose of text being presented (Nuttall, 1996). With online reading, readers are reading on multiple digital platforms that enables them to enjoy reading (Singer & Alexander, 2016; Tazijan et al., 2022; Liman Kaban & Karadeniz, 2021) Hence, the ability to read effectively requires effort from the reader in making mental connections between text or online text and his existing knowledge with the assistance of reading tools available to them.

In relation to language learning, research studies have begun to focus on metacognitive skills (Hamid et. al, 2020; Rianto, 2021; Azmuddin et al, 2017; Ahmadian & Pasand 2017; Darwish 2017;

Rajab 2017; Jusoh & Abdullah, 2015; Ramli et al., 2011). Flavell (1979) describes metacognitive strategy as a mechanism that helps learners to monitor and regulate learning. O'Malley and Chamot (1990, p. 44) define metacognitive strategies as, '...higher order executive skills that may entail planning for, monitoring or evaluating the success of learning activity'. In L2 learning, metacognitive skills are even more crucial. As Anderson (2002, 2012) mentioned, reading effectively is one of the most essential skills that teachers can use to help L2 learners develop as it leads to the success of language learning. For ESL learners, being able to make the distinction between effective and ineffective learning strategies proved to be beneficial. In L2 learning, Krashen (1988, 1987) also argues that this ability to edit linguistic output in a communicative setting is vital. The success of an L2 learner is profoundly affected by his ability to monitor or edit his own learning process (Krashen, 1988, 1987).

The strategy or ability to monitor and adapt one's reading skills during a reading task is the determining factor to successful reading. Zápotočná (2016) postulates that new literacy or knowledge gained be it reading online or offline entails the same information processing as it is both cognitive process in order to add new information. Therefore, metacognitive strategies are more prevalent and crucial during the search for information phase where readers are more interested in finding various information sources (Zápotočná, 2016). Researchers such as Anderson (2002) as well as Mokhtary and Sheorey (2002) lay emphasis on the use of metacognitive skills in L2 reading. In further research on ESL metacognitive skills, they indicate that inculcating awareness and giving training of metacognitive strategies to learners are integral aspects in ESL reading classrooms. Mokhtari and Sheorey (2002) categorize metacognitive strategies into Global reading strategies (Readers carefully plan their reading), Problem-Solving strategies (Readers work directly with text to solve problems while reading) and Support strategies (Readers use basic support mechanisms to aid reading). They developed a Survey of Reading Strategies (SORS), that is aimed to elicit metacognitive skills information from L2 students. The information gained from the survey is used to make the learners aware of their reading strategies and also for the teachers to prepare better reading lessons (Mokhtari & Reichard, 2002).

Anderson (2002) on the other hand, classifies metacognitive reading strategies of L2 learners into five primary components:

i. preparing and planning for effective reading
ii. deciding when to use particular reading strategies
iii. knowing how to monitor reading strategy use
iv. learning how to orchestrate various reading strategies
v. evaluating reading strategy use

Anderson (2003) adapted these strategies and highlighted the importance of these strategies in online reading instruction by developing the Online Survey of Reading Strategies (OSORS). Research on metacognitive strategies yielded different outcomes depending on the population and purpose of reading (Ramli et al., 2011; Jusoh & Abdullah, 2016; Azmuddin et al, 2017; Hamid et. al, 2020; Rianto, 2021).

According to Cambridge Assessment: International Education (2024) metacognition takes place in 4 phases: Tacit, Aware, Strategic and Reflective. Perkins (1992) identified four levels of metacognitive learners which provide a useful framework for teachers: Tacit, Aware, Strategic and Reflective. Being tacit means a student understands the task that is given to him or her. A teacher can help students by assigning or setting a goal for them. As the students embark on their task, the students are aware and choose strategies to employ that would be effective. He may be using tools to take notes while reading. The student is being strategic when he starts recognizing and monitoring the wide array of strategies that work for him. As he enters the reflective phase the student will question and evaluate the task that he is given. Strategic learners organise their thinking by using problem-solving, grouping and classifying, evidence-seeking and decision-making etc. They know and apply the strategies that help them learn. Metacognition helps students to become independent learners. Learners who use metacognitive strategies are probably able to achieve more. Research shows that improving a learner's metacognitive practices

may compensate for any cognitive limitations they have. A key challenge for teachers is being able to recognise how well their students understand their own learning processes.

Methodology

This study employed a quantitative approach to answer the research questions. The study was conducted in a local university in Shah Alam, Malaysia. 241 students from a language programme responded to the survey. The survey was distributed by the researcher using Google form.

Research Instrument

This survey is based on Perkin's (1992) levels of metacognition framework. It seeks to describe the ESL learners' purpose of using AI and their metacognitive reading online strategies while using AI. Part A of the questionnaire gathered the demographic of the adult learners who were involved in the study. Part A of the questionnaire was analysed using descriptive statistics to give an overview of the characteristics of the selected population. Both descriptive and statistical tests (frequency and percentage) were used to analyse the data.

In Part B of the questionnaire, the respondents are required to identify the purpose and the metacognitive strategy used during reading online and using AI. The survey listed 5 purposes of using AI and 8 metacognitive strategies. These metacognitive strategies are selected based on the 4 categories of metacognition which are tacit, aware, strategic and reflective. Data were analysed using descriptive statistics, applying both graphical and numerical techniques in SPSS and Microsoft Excel programmes. Statistical techniques such as test for normality, percentages, mean and standard deviation and coefficient of variation test (CV). The final question of the questionnaire was an open-ended question that required them to elaborate on the purpose of using AI in their studies. The answers were analyzed and incorporated with quantitative data.

Findings and Discussion

241 students participated in the survey. The data showed that there were 67.6% female and 32.4% male students. They were also asked the frequency of their AI use. The students mainly used AI *'Frequently'* (47.7%). However, 28.2% of the students rated as *'Very frequently'* to using AI which overall shows a significant use of AI among them. The major findings of the survey are as follows.

Purpose of using AI

It was found that the main purpose of the students' using AI is to complete their assignments (69.8%). The lowest percentage for using AI is for Entertainment at 37.3%. This shows that AI tools that provide academic purposes are the ones that are sought after by the students. This indicates that the students have a specific purpose when using AI. This is followed by creative writing (64.9%). This finding reflects the notion by previous research where AI is utilized in writing activities (Woo & Choi, 2021; Roe et al., 2023). Translating their work was also one of the top 3 purposes of using AI (54.4%). Translating is a strategy to help learners acquire language. Having AI to help translate will expedite the cognitive process of activating schemata of the readers. Relating to one's existing knowledge will deepen understanding (Anderson, 2003). Despite the popular tools for editing like Quillbot only 37.3% used them. The findings also indicate that only 6.1% do not use AI.

Overall, the students use AI applications to improve their assignments. As ESL students, they do rely on AI to a certain extent for language accuracy, for example for translating and editing.

Metacognitive reading strategies used while reading responses from AI

The students were asked the metacognitive strategies used while they were using AI. They were asked to tick all the related metacognitive strategies. their responses were tabulated in percentages. Table 1 depicts the findings.

Table 1. Metacognitive strategies used while reading responses from AI

	Metacognitive strategies	**Percentage**
MR1	Setting a goal/ purpose	43.2
MR2	Evaluating responses	54.4
MR3	Seeking clarification for the responses	51.9
MR4	**Questioning yourself while reading**	**54.8**
MR5	**Monitoring yourself while reading text**	**38.2**
MR6	Taking notes of the responses	51.0
MR7	**Searching other references**	**62.7**
MR8	Summarising the responses	43.2

The findings reveal that *'Searching other references'* or MR7 (62.7%) is the highest or most frequent metacognitive strategy used by these language students. Through this process, the students not only broaden their understanding but also develop a critical approach to evaluating the credibility and relevance of the information they encounter. This helps them to reduce biases and enhance accuracy of information. Such a strategy is used during the Strategic phase where the students start to check for other alternatives or sources like information from other platforms or media (Perkins, 1992). This makes *'Searching for other references'* a powerful metacognitive strategy that enhances learning and academic performance. The next metacognitive strategy frequently used is *'Questioning yourself while reading'* or MR4 (54.8%). By continuously questioning themselves, the student actively engages with the material, leading to better understanding and retention of the information. Anderson (2002) explains that this strategy helps students to monitor their understanding. The students are actively engaged with the text by questioning themselves. Interestingly, *'Monitoring yourself while reading text'* MR5 (38.2) scored the lowest percentage. Monitoring refers to the ongoing process of tracking and assessing one's understanding and performance during a learning activity (Fiedler, et al., 2019). It involves being aware of one's cognitive processes and adjusting as needed to enhance comprehension and achieve learning goals. Monitoring oneself while reading can be a fundamental process and a near advanced strategy depending on the context. In this case while using AI in reading resources, the students rate this strategy the lowest. Other strategies range between 43-54%.

Relationship among the metacognitive reading strategies used while reading responses from AI

This study also seeks to find whether there is a significant relationship among the strategies used. Table 2 depicts this relationship.

Table 2. Relationship among the metacognitive reading strategies used

Variable	**Comparing Variable**	**X2**	**df**	**p-value**	**Phi**
Setting a goal / purpose (MR1)	Evaluating responses (MR2)	25.8	1	.000	.327
	Seeking clarification for responses (MR3)	22.1	1	.000	.303
	Questioning yourself while reading	13.5	1	.000	.236

	responses (MR4)				
	Monitoring yourself while reading responses (MR5)	7.6	1	.006	.178
	Taking notes of responses (MR6)	2.4	1	.123	.099
	Searching other references (MR7)	3.4	1	.066	.118
	Summarising responses (MR8)	5.7	1	.017	.154
Evaluating responses (MR2)	Seeking clarification for responses (MR3)	29.7	1	.000	.351
	Questioning yourself while reading responses (MR4)	17.8	1	.000	.272
	Monitoring yourself while reading responses (MR5)	25.6	1	.000	.326
	Taking notes of responses (MR6)	3.4	1	.065	.119
	Searching other references (MR7)	15.9	1	.000	.257
	Summarising responses (MR8)	20.8	1	.000	.294
Seeking clarification for responses (MR3)	Questioning yourself while reading responses (MR4)	20.6	1	.000	.293
	Monitoring yourself while reading responses (MR5)	16.4	1	.000	.261
	Taking notes of responses (MR6)	4.5	1	.034	.136
	Searching other references (MR7)	8.1	1	.004	.183
	Summarising responses (MR8)	15.4	1	.000	.252
Questioning yourself while reading responses (MR4)	Monitoring yourself while reading responses (MR5)	33.1	1	.000	.371
	Taking notes of responses (MR6)	23.3	1	.000	.311
	Searching other references (MR7)	6.2	1	.013	.160
	Summarising responses (MR8)	5.6	1	.018	.152
Monitoring yourself while reading responses (MR5)	Taking notes of responses (MR6)	12.0	1	.001	.223
	Searching other references (MR7)	2.2	1	.142	.095
	Summarising responses (MR8)	10.8	1	.001	.212
Taking notes of responses	Searching other references (MR7)	4.5	1	.035	.136

(MR6)	Summarising responses (MR8)	6.7	1	.010	.166
Searching other references (MR7)	Summarising responses (MR8)	11.9	1	.001	.222

Based on the Chi-Square analyses featured between the eight variables, all with 1 degree of freedom. Overall, the effect size calculated using Phi indicated that there is a weak association between the metacognitive reading strategies used while reading responses from AI. Nevertheless, according to the p-values, there seems to be a significant association between MR1 and MR2 (X2 of 25.8; p-value of .000), MR3 (X2 of 22.1, p-value of .000), MR4 (X2 of 13.5; p-value of .000), MR5 (X2 of 7.6, p-value of 0.006) and MR8 (X2 of 5.7; p-value of 0.017); between MR2 and MR3 (X2 of 29.7; p-value of .000), MR4 (X2 of 17.8; p-value of .000), MR5 (X2 of 25.6; p-value of .000), MR7 (X2 of 15.9; p-value of .000) and MR8 (X2 of 20.8; p-value of .000); between MR3 and MR4 (X2 of 20.6; p-value of .000), MR5 (X2 of 16.4; p-value of .000), MR6 (X2 of 4.5; p-value of .034), MR7 (X2 of 8.1; p-value of .004) and MR8 (X2 of 15.4; p-value of .000); between MR4 and MR5 (X2 of 33.1; p-value of .000), MR6 (X2 of 23.3; p-value of .000), MR7 (X2 of 6.2; p-value of .013) and MR8 (X2 of 5.6; p-value of .018); between MR5 and MR6 (X2 of 12.0; p-value of .001) and MR8 (X2 of 10.8; p-value of .001); between MR6 and MR7 (X2 of 4.5; p-value of .035) and MR8 (X2 of 6.7; p-value of .010); and between MR7 and MR8 (X2 of 11.9; p-value of .001). On the other hand, there were no significant associations found between the other variables, specifically between MR1 and MR6 and MR7; between MR2 and MR6; and between MR5 and MR7.

Relationship between male and female students' use of metacognitive reading strategies while reading responses from AI

Finally, the study investigated the relationship between male and female students' use of metacognitive reading strategies while reading responses from AI. The results are as follows:

Table 3. Relationship between male and female students' use of metacognitive

Metacognitive Strategies	**Male**		**Female**		**X2**	**df**	**p-value**	**Phi**
	Yes	**No**	**Yes**	**No**				
Setting a goal / purpose (MR1)	40	38	64	99	3.106	1	.078	.114
Evaluating responses (MR2)	40	38	91	72	.439	1	.507	-.043
Seeking clarification for responses (MR3)	44	34	81	82	.953	1	.329	.063
Questioning yourself while reading responses (MR4)	44	34	88	75	.125	1	.724	.023
Monitoring yourself while reading responses (MR5)	25	53	67	96	1.832	1	.176	.087
Taking notes of responses (MR6)	36	42	87	76	1.101	1	.294	.068
Searching other references (MR7)	46	32	105	58	.668	1	.414	.053
Summarising responses (MR8)	34	44	70	93	.009	1	.925	.006

To evaluate the application of metacognitive strategies applied based on the two different genders, a Chi Square Test of Independence was executed. The frequencies revealed among the male respondents, 40 of them use AI to set a goal / purpose (MR1) and to evaluate responses (MR2) respectively while 38 did not, respectively. Similarly, 44 of them use AI to seek clarification for responses (MR3) and to question themselves while reading responses (MR4) respectively, while 34 did not, respectively. As for the other variables involving the male respondents, 25 of them use AI to monitor themselves (MR5) with 53 did not; 36 used AI to take notes of responses (MR6) with 42 did not; 46 used AI to search for other references (MR7) with 32 did not; and 34 used AI to summarise responses (MR8) with 44 did not. As for the female respondents when using AI, the data shows that 64 uses AI to set a goal / purpose with 99 did not, 91 to evaluate responses with 72 did not, 81 to seek clarification for responses with 82 did not, 88 to question themselves while reading responses with 75 did not, 67 to monitor themselves while reading responses with 96 did not, 87 to take notes of responses with 76 did not, 105 to search for other references with 58 did not, and 70 to summarise responses with 93 did not.

The analysis resulted in Chi-Square statistics (X2) of 3.106 (MR1), .439 (MR2), .953 (MR3), .125 (MR4), 1.832 (MR5), 1.101 (MR6), .668 (MR7), and .009 (MR8), with 1 degree of freedom. The associated p-value for all analyses was above the alpha level of 0.05, indicating that statistically there are no significant relationships between the use of metacognitive reading strategies while reading responses from AI and gender. Additionally, the effect size was calculated using Phi, measuring the association for 2x2 contingency tables, as such from these variables. The calculations all indicated that there was a weak association between the use of metacognitive reading strategies while reading responses from AI and the respondents' gender.

Conclusion

From a survey among a group of Malaysian students, this study found that the majority of the students use AI in their assignments for the purpose of improving the quality of the assignment. This is also supported by the metacognitive strategy, *'Searching other references',* as a way for them to seek more information regarding the assignment. Hence, AI tools can provide learners with a kickstart for the tasks that are assigned to them. In terms of whether the metacognitive strategy use is dependent on each other, it was found that the association is weak. In addition, the study also shows that gender does not play a significant role in terms of strategy use. These findings could assist teachers in understanding the strategies involved when students use AI and how they perceive the purpose or benefits AI can offer to them. Since students are likely to use AI like ChatGPT to brainstorm ideas which encourages self-regulation and monitoring, teachers could assist students to use this AI tool more effectively by using specific keywords. This would help students to get information more accurately and from more reliable sources. AI tools like Quilbot can be integrated in the writing classroom by explaining to learners how to use the tools ethically for their assignments. Effective learners will utilize all levels of metacognitive strategies, beginning with monitoring and advancing to more complex processes to enhance their learning outcomes. Recognizing that students used an array of strategies while using AI shows that they are aware of the potential boon and bane of AI. It is crucial for effective learning and learning becomes increasingly sophisticated as learners develop their metacognitive skills.

Suggestions for Future Research

It is suggested that future studies should include more variables like age or academic background to gauge the impact on each other. Investigate how students' competency in using AI tools relates to their academic success and whether improving AI literacy can enhance learning outcomes. It is also recommended to utilise qualitative methods such as interviews or focus groups to gain deeper insights into students' experiences, perceptions, and challenges related to using AI and metacognitive strategies.

Co-Author Contribution

All authors contributed to the paper. Author 1li worked on the study conception and research design. The data collection and analysis were performed by Authors 2, 3 and 4. The first draft of the manuscript was written by Authors 1 and 5. All authors commented on previous versions of the manuscrip. All authors read and approved the final manuscript.

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