

From Preparation to Reflection: Metacognitive Strategies Used in Students Presentations

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ABSTRACT

This study investigates the metacognitive strategies employed by engineering students in planning, monitoring, and evaluating their presentations. Adopting a quantitative research design, data were collected from 82 students of Diploma in Chemical Engineering at a Malaysian public university using a questionnaire adapted from Danuwong's (2006) metacognitive strategies framework. The findings reveal that students demonstrated moderate to high engagement in metacognitive strategies across all three phases of presentation tasks. In the planning phase, the strongest emphasis was placed on content preparation, such as identifying relevant information and activating prior knowledge, while strategies related to self-regulation, such as managing distractions, were less practiced. During monitoring, students frequently engaged in reflective questioning and attentiveness to content but showed weaker integration of prior knowledge and progress tracking. In the evaluation phase, learners focused on reflecting and transferring strategies to future tasks but demonstrated limited critical appraisal of strategy suitability and adjustment based on new knowledge. Overall, the study highlights an imbalance between strong content-focused strategies and weaker self-regulatory practices, underscoring the need for targeted pedagogical interventions to enhance adaptive evaluation and self-regulation. Strengthening these areas will not only improve presentation performance but also contribute to the development of lifelong learning skills.

Keywords: communication, learning strategies, metacognitive strategies, oral presentation

INTRODUCTION

Speaking is widely regarded as a core component of language acquisition, as it requires the integration of multiple skills and sub-skills. Azis (2019) describes speaking as the act of sharing ideas, information, and emotions through both verbal and non-verbal communication. To be effective, speakers need competence in areas such as comprehension, fluency, grammar, vocabulary, and pronunciation (Sodagari & Dastgoshadeh, 2016). Consequently, speaking is considered a key indicator of learners' ability to use language appropriately and interact successfully (Nunan, 1991). Learners often face anxiety and low confidence when required to use English orally, both within and beyond the classroom (Wael et al., 2018). Such challenges hinder proficiency development, but adopting effective learning strategies can accelerate second language acquisition, enhance confidence, and create a more enjoyable and effective learning experience (Sartika et al., 2019).

Metacognitive knowledge, defined as the awareness and regulation of one's own thinking processes, is increasingly recognised as a vital element in language assessment. It supports learners in developing key language skills such as reading, writing, speaking, and listening by enabling them to plan, monitor, and evaluate their learning more effectively. While traditional assessments often prioritise language proficiency alone, recent

research highlights the importance of also evaluating metacognitive skills, as they provide deeper insights into learners' strategies and potential for improvement (Teng & Mizumoto, 2024; Siregar et al., 2024). Similarly, Zhang and Guo (2020) emphasise that integrating metacognitive awareness into assessments can help educators better support students' strategy use, ultimately enhancing language proficiency.

Speaking in English remains a persistent challenge for second language learners, who often struggle with anxiety, self-doubt, and negative perceptions of their abilities. These issues not only reduce their motivation but also hinder the development of speaking skills and confidence in using the language. To address these challenges, it is essential to investigate the strategies and techniques learners adopt to overcome such difficulties.

LITERATURE REVIEW

Metacognitive Strategies

Recent research highlights the significant role of metacognitive strategies across language skills such as reading, writing, speaking, and listening. For instance, Teng and Qin (2024) demonstrate how metacognitive writing strategies, grounded in self-regulated learning theory, enhance EFL learners' performance in multimedia contexts. Similarly, Razzaq and Hamzah (2024) show that combining metacognitive writing strategies with learners' willingness to write leads to improved ESL writing outcomes. In speaking, Rastriaji (2024) reports notable gains in students' performance after applying metacognitive strategies. Likewise, Ahmadi Safa and Motaghi (2024) find that metacognitive scaffolding has a stronger positive impact on EFL learners' listening skills compared to cognitive or non-scaffolding approaches.

Flavell (1979) identified three key dimensions of metacognitive knowledge which are person, task, and strategy. Person knowledge refers to awareness of individual and general factors, such as cognitive strengths, weaknesses, emotions, and motivation, that influence thinking. Task knowledge relates to recognising how the features of a task in terms of its complexity, relevance, and organisation which affect cognitive activity. Strategy knowledge concerns understanding the methods and techniques, such as problem-solving or memorisation strategies, that can be applied to achieve learning goals. Later, Flavell (1987) highlighted the importance of these dimensions for effective self-regulation, noting that awareness of one's abilities, task demands, and available strategies enables individuals to monitor, control, and optimise their cognitive processes.

Research consistently shows that metacognitive instruction and awareness play a pivotal role in enhancing language learning outcomes. Kobayashi (2020) demonstrated that incorporating metacognitive instruction into oral communication not only improved learners' autonomy and interactional competence but also strengthened their regulation of cognition and strategic use, particularly benefiting those with lower initial skills. Complementing this, Teng and Zhang (2023) reported that metacognitive development is closely tied to improvements in reading, writing, vocabulary breadth, and morphological awareness. Taken together, these studies affirm that fostering metacognitive awareness equips learners with the ability to regulate their learning more effectively, leading to stronger overall language proficiency.

METHODOLOGY

This study adopted a quantitative research design, utilising an online questionnaire distributed through Google Forms. The instrument was adapted from Danuwong's (2006) metacognitive strategies questionnaire and employed a 5-point Likert scale to measure three key strategies: planning, monitoring, and evaluating presentations. The questionnaire comprised four demographic items (gender, semester of study, faculty, and current course) and three main sections. Each section included ten items targeting one of the constructs which is planning, monitoring, and evaluating. The scales rated from 1 (Strongly Disagree) to 5 (Strongly Agree). Descriptive statistics were used to analyse the collected data.

The aim of the study was to examine the metacognitive strategies employed by chemical engineering students in preparing, overseeing, and assessing their presentations. Participants consisted of 82 students from semester 3 enrolled in the Diploma in Chemical Engineering programme at a Malaysian public university.

FINDINGS

RQ 1: What metacognitive strategies are used by students in planning a presentation?

Table 1 shows the metacognitive strategies used by students in planning a presentation. Among the strategies, the highest mean was observed for '*identifying the aspects of information to prepare for the presentation*' ($M = 3.99$, $SD = .680$), suggesting that students are most conscious about organizing relevant content ahead of time. This was followed by "*deciding on prior knowledge about the content that would help later*" ($M = 3.86$, $SD = .666$), and "*trying to figure out what to do in sequence to understand the materials*" ($M = 3.59$, $SD = .787$), both indicating a moderately high level of planning.

Other strategies showing moderate use include "*thinking in advance about the possible information in the materials*" ($M = 3.56$, $SD = .822$), "*predicting questions that could be asked*" ($M = 3.51$, $SD = .950$), and "*deciding on one's own learning objectives*" ($M = 3.51$, $SD = .808$). These scores imply that students do engage in preparatory thinking but may vary in their consistency or depth of application. Conversely, the lowest mean was recorded for "*deciding in advance how to ignore possible distractions*" ($M = 3.37$, $SD = .828$), indicating this is the least practiced strategy. "*Checking one's personal comprehension in advance*" ($M = 3.44$, $SD = .822$) and "*thinking about strategies to learn the materials*" ($M = 3.47$, $SD = .808$) were also on the lower end, suggesting a potential gap in students' metacognitive awareness regarding self-regulation and strategy selection.

Table 1: Metacognitive strategies used by students in planning a presentation

	Mean	Std. Deviation
1. Decide my own learning objectives.	3.51	.808
2. Identify the aspects of information for me to prepare for the presentation	3.99	.680
3. Decide on my prior knowledge about the content that would help me later.	3.86	.666
4. Identify possible problems that I might face in this task.	3.72	.711
5. Decide in advance how to ignore possible distractions (e.g., mental, physical, and environment).	3.37	.828
6. Check in advance my own personal comprehension.	3.44	.822
7. Predict the questions that could be asked.	3.51	.950
8. Think in advance about the possible information in the materials.	3.56	.822
9. Think in advance about the strategies for me to learn about the materials.	3.47	.808
10. Try to figure out what I do in sequence to understand the materials.	3.59	.787

RQ 2: What metacognitive strategies are used by students in monitoring a presentation?

The metacognitive strategies used by students in monitoring the presentation is presented in Table 2. The highest reported strategy was "*asking oneself if doing the right steps*" ($M = 4.02$, $SD = .689$), indicating that students are highly reflective and frequently evaluate the appropriateness of their actions during the task. This was followed by "*asking oneself if important information should be remembered*" ($M = 3.96$, $SD = .558$), and "*checking attention to important content details*" ($M = 3.90$, $SD = .784$), suggesting active engagement in cognitive monitoring.

The least reported monitoring behaviors included "*asking oneself about progress*" ($M = 3.68$, $SD = .722$) and "*deciding the relationship with prior knowledge*" ($M = 3.74$, $SD = .721$), although these still reflect moderately high use. Students also moderately practiced "*asking if they have the knowledge for understanding*" ($M = 3.80$, $SD = .732$) and "*checking if predictions were correct*" ($M = 3.79$, $SD = .786$).

Table 2: Metacognitive strategies used by students in monitoring a presentation

	Mean	Std. Deviation
11. check from time to time on my understanding of the topic, sentences, or body paragraphs.	3.77	.657
12. ask myself about my progress.	3.68	.722

13. ask myself if I am doing the right steps	4.02	.689
14. ask myself if I am using appropriate techniques for the task.	3.90	.700
15. ask myself if I should have the knowledge for understanding.	3.80	.732
16. ask myself if I am paying attention to important details within the content.	3.90	.784
17. decide if there is any relation with my prior knowledge on the matter.	3.74	.721
18. ask myself if I should remember any important information.	3.96	.558
19. ask myself if the information I have in the reading is linked with other subjects I know.	3.83	.685
20. ask myself if any of the predictions I made are correct.	3.79	.786

RQ 3: What metacognitive strategies are used by students in evaluating a presentation?

Table 3 shows the metacognitive strategies used by students in evaluating a presentation. The finding shows the most frequently practiced strategy was *"thinking whether to do the same for the next task in the same subject"* ($M = 3.80$, $SD = .697$), indicating students actively reflect on the success of their current approach for future applications. Similarly, *"considering how to reapply the same strategies in other subject areas"* ($M = 3.78$, $SD = .707$) and *"checking if goals were met"* ($M = 3.77$, $SD = .855$) ranked high, suggesting a strong awareness of strategy transfer and goal reflection.

In contrast, the least practised evaluation strategies used by students was *"Deciding on the suitability of strategies to achieve objectives"* ($M = 3.47$, $SD = .709$), followed by *"Deciding if changes are needed based on new knowledge"* ($M = 3.57$, $SD = .741$).

Table 3: Metacognitive strategies used by professional communication students in evaluating a presentation

	Mean	Std. Deviation
21. check if I have met my goals.	3.77	.855
22. decide on the suitability of the strategies taken to achieve the objectives.	3.47	.709
23. think if I should do the same for the next task for the same subject.	3.80	.697
24. consider if/how I can reapply the same strategies but in the same situations in other disciplines/subject areas.	3.78	.707
25. think about if there are other strategies that may help me in the task.	3.70	.798
26. ask myself if I am able to summarize what I have learnt (mentally, orally, written, or graphically).	3.65	.674
27. think of any new knowledge/information/skills I have learnt	3.77	.746
28. judge if any of my predictions or guesses that I have made earlier are correct.	3.70	.887
29. decide if there is any change based on the newly acquired knowledge/information to what I already know.	3.57	.741
30. evaluate if the newly acquired knowledge/ information is useful for my future learning.	3.73	.707

DISCUSSION

The findings of this study provide valuable insights into the metacognitive strategies employed by chemical engineering students in planning, monitoring, and evaluating their presentations. Overall, the results suggest that students demonstrate moderate to high use of metacognitive strategies in their presentations. In the planning phase, the most prominent strategy identified was *organizing relevant content ahead of time*, as evidenced by the highest mean score for "identifying the aspects of information to prepare for the presentation." This indicates that students are highly aware of the importance of content preparation to ensure the presentation is delivered effectively. Strategies such as activating prior knowledge and sequencing materials were also reported at moderately high levels, suggesting that students recognize the role of connecting new content to existing knowledge frameworks. However, strategies associated with self-regulation such as managing distractions, pre-checking comprehension, and deciding on learning strategies received comparatively lower means. This pattern reflects a potential weakness in students' metacognitive awareness of internal and external barriers to learning.

Such findings resonate with research that highlights how learners often prioritise task preparation over self-regulation mechanisms, potentially limiting their ability to sustain focus and adapt flexibly during the task.

During the monitoring phase, students reported strong engagement with reflective questioning. These results highlight that students actively engage in on-task evaluation and remain attentive to detail, which are critical aspects of effective monitoring. Similarly, the frequent practice of checking attentiveness to content demonstrates an awareness of sustaining focus throughout the presentation process. Nevertheless, during monitoring phase, students lacked strategies such as *asking about progress* and *relating information to prior knowledge*, which were less commonly employed. This suggests that while students are attentive to immediate task demands, they may lack deeper integration of prior knowledge into real-time monitoring. The moderate use of prediction-checking further illustrates that students' ability to anticipate and adjust during tasks could be strengthened.

The evaluation phase revealed that students frequently reflect on *how to transfer strategies to future tasks* and *whether goals were achieved*. This indicates that students show an orientation toward reflective practice and recognize the value of strategy transferability across contexts. Such awareness is crucial in professional communication, where adaptability to different presentation scenarios is often required. At the same time, strategies such as *judging the suitability of approaches* and *making adjustments based on newly acquired knowledge* were practiced less frequently. This finding suggests that while students are reflective, they may not critically appraise the effectiveness of their strategies or implement revisions for future improvement. The gap between reflection and strategy modification is significant, as effective metacognition involves not only evaluating outcomes but also adjusting strategies for long-term learning gains.

CONCLUSION

The findings highlight that students demonstrate strong awareness in areas of content preparation, attentiveness, and reflective transfer of strategies. However, there remain clear opportunities for enhancing self-regulation and adaptive evaluation. This imbalance suggests that while students are capable of preparing and reflecting, they may struggle with deeper critical appraisal and sustained regulation of their learning processes.

In summary, professional communication students exhibit moderate to high metacognitive engagement in their presentation tasks, with particular strengths in content-focused planning and reflective transfer. Yet, the relative neglect of self-regulation and adaptive evaluation suggests a need for targeted pedagogical interventions. Strengthening these areas will not only enhance students' presentation performance but also cultivate lifelong learning skills essential for professional contexts.

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