

EXPLORING UNIVERSITY STUDENTS' COGNITIVE CHALLENGES AND SELF-REGULATORY STRATEGIES IN ORAL PRESENTATIONS THROUGH A CLIL-BASED COURSE

Niswa Aghisty
Universitas Negeri Semarang
niswaaghisty12@students.unnes.ac.id

Puji Astuti
Universitas Negeri Semarang
puji.astuti.ssu@mail.unnes.ac.id

Abstract: Oral presentations in Content Language Integrated Learning (CLIL) environments often impose cognitive demands, as students are required to process subject content and express it in a foreign language. Although research on CLIL-based speaking activities is rapidly increasing, few studies have explored the cognitive challenges and self-regulatory strategies of research students during oral presentation tasks, especially through the lenses of Cognitive Load Theory and Self-Regulated Learning Theory at higher education levels. Therefore, this study aims to investigate university students' cognitive challenges and self-regulatory strategies in conducting oral presentations through a CLIL-based course. The study employs a qualitative case study to gain a deeper understanding of students' experiences. The study took place at an undergraduate English Education program at a state university in Semarang, Indonesia, focusing on the English Course Management course. Furthermore, a triangulation is used to reduce the risk of misinterpretation as it utilizes a questionnaire, semi-structured interviews, and document analysis to collect the data. Additionally, thematic analysis is used to identify recurring themes. The finding indicates three interrelated cognitive challenges: unfamiliarity with business and management vocabulary, the dual-processing burden of simultaneously managing language accuracy and content delivery, and psychological pressure as a downstream consequence of accumulated cognitive overload. Thus, three self-regulatory strategy clusters were identified across the SRL cycle: proactive forethought strategies, real-time performance strategies, and post-presentation self-reflection. Therefore, teachers are recommended to integrate pre-presentation vocabulary scaffolding activities to reduce students' cognitive load, while incorporating self-regulatory strategies into the CLIL curriculum to support students' adaptive preparation.

Keywords: *CLIL, cognitive load, self-regulated learning, oral presentation, EFL students*

INTRODUCTION

The rapid growth of using English as an instructional language in higher education contexts has been widely adopted as a part of internationalization efforts, and has raised challenges for students whose L1 is not English in comprehending their content knowledge (Halim et al., 2013). Therefore, some higher education institutions integrate Content and Language Integrated Learning (CLIL) as a learning approach. According to Gaballo (2023), CLIL is a

well-known learning approach in educational settings that integrates language learning with the learning of subject content, allowing students to focus on both simultaneously. The use of CLIL can aid university students in comprehending complex English materials when English is not the university's official language (Sampaio et al., 2021). Thus, it enables students to engage meaningfully with subject content while using English as their instructional language.

By promoting the simultaneous acquisition of a foreign language and subject content, CLIL offers a more immersive way to develop language skills actively (Hu, 2024). In CLIL classrooms, active engagement with content and language can be achieved through oral communication activities, including oral presentations. In higher education, oral presentations require students to deliver complex knowledge, engage the audience, and communicate ideas effectively in a foreign language (Hast, 2025; Liu et al., 2024). This supports Fujimura's (2018) findings that CLIL classrooms are naturally dialogic and full of spoken interaction, making oral presentation tasks a suitable part of the approach.

Besides the effectiveness of implementing CLIL in improving their presentation skills, students often encounter numerous challenges during their classroom presentations. Since it involves a fundamental skill like speaking, students frequently experience anxiety when presenting their subject content in a CLIL classroom, as they are using a foreign language to present subject matter, particularly in English (Hadi et al., 2020). Previous research indicates that students conducting oral presentations in CLIL-based courses face multifaceted challenges encompassing linguistic deficiencies in academic and technical vocabulary, cognitive overload caused by the need for rapid translation and content processing, and psychological barriers such as Foreign Language Anxiety (FLA), fear of negative peer judgment, and feelings of inadequacy (Akay et al., 2025; Chen et al., 2024; Chien & Valcke, 2020; Mihajlov, 2023; Zhang et al., 2025). These challenges often affected students' fluency, leading to unclear idea expression, heavy reliance on notes or slides, and less interaction with the audience.

To cope with these challenges, students often employ various strategies to enhance their presentation skills in CLIL-based courses. Fitriana (2023) reported that students use strategies such as relaxation, preparation, and concentration to manage anxiety during oral presentations. Additionally, seeking help from friends and lecturers is frequently used to manage anxiety and clarify uncertainties (Wilang, 2022). However, Abdurahman & Rizqi (2020) found that some students also resort to ineffective strategies such as avoidance and over-reliance on notes, highlighting the need for more systematic and adaptive coping approaches.

Previous researchers (Abdurahman & Rizqi, 2020; Akay et al., 2025; Chen et al., 2024; Chien & Valcke, 2020; Fitriana, 2023; Mihaljević Djigunović, 2004; Subon & Tarmim, 2021; Wilang, 2022; Zhang et al., 2025), have recommended that future CLIL research move beyond measuring students' learning process and outcomes, particularly in speaking-related activities. In addition, several researchers (Akay et al., 2025; Zhang et al., 2025) suggest adopting qualitative approaches to investigate students' perspectives on the challenges and strategies in improving the oral communication context, as purely quantitative designs have been found to limit deeper insights into students' emotional and cognitive experiences. Following these recommendations, although several studies have been conducted on CLIL-based courses and oral communication, particularly focusing on speaking skills, a limited number of studies have examined these experiences through the lens of Cognitive Load Theory and Self-Regulated Learning Theory, particularly at the higher education level.

Cognitive Load Theory (CLT), originally developed by Sweller (1988) and adapted for foreign language and CLIL contexts by Roussel et al., (2017) helps to identify cognitive difficulties stemming from a foreign language's status as biologically secondary knowledge, which places a significant load on the limited capacity of working memory. It consists of three main components: intrinsic load (the inherent difficulty of management concepts), extraneous load (the added burden of using a foreign language), and transient information (the time pressure that rapidly disappears when processing spoken information). Additionally, to map students' coping strategies, the study uses Zimmerman & Moylan's (2009) Self-Regulated Learning (SRL) theory, which describes how learners control their cognition, behaviour, and motivation to achieve their learning goals. It was also summarized by Panadero (2017). This cyclical approach classifies student behaviours into three phases: forethought (planning and goal setting before presentation), performance (the strategies to maintain focus during presentation), and self-reflection (evaluating the performance).

By integrating these two complementary theoretical frameworks within a triangulated mixed-methods design, this study contributes a dual-theoretical perspective that has not been previously applied to CLIL-based oral presentation research. Therefore, this study aims to explore the cognitive challenges and self-regulatory strategies of university students in delivering oral presentations within a CLIL-based course at a state university in Semarang, Central Java, Indonesia, guided by the following research questions:

1. What cognitive challenges do university students encounter throughout the process of delivering oral presentations in a CLIL-based course?
2. How do university students employ self-regulatory strategies across the forethought, performance, and self-reflection phases to manage their oral presentations?

It was anticipated that students would experience significant cognitive load due to the dual demands of language and content processing, and that they would employ self-regulatory strategies as adaptive responses to these challenges. This paper is organized as follows: the Research Methodology section describes the research design, participants, instruments, and data analysis procedures; the Results and Discussion section presents the findings organized by research question; and the Conclusion section summarizes the key findings, limitations, and pedagogical implications.

This article indicates that the cognitive challenges and self-regulatory strategies in CLIL-based oral presentations are interconnected processes as they are best understood by integrating the perspectives of Cognitive Load Theory and Self-Regulated Learning Theory.

RESEARCH METHODOLOGY

This study employed a qualitative case study to examine students' cognitive challenges and self-regulatory strategies in their presentation tasks through a Content and Language Integrated Learning (CLIL) based course. The case study approach was chosen to allow an in-depth understanding of students' experiences and motivations within a specific educational setting (Gill et al., 2008). This method is especially effective for gaining context-dependent insights into how the CLIL approach experience students' presentation skills at the higher education level. Additionally, the research took place at an undergraduate English Education program at

a state university in Indonesia, focusing on the English Course Management course. English Education students were specifically selected for two reasons. First, their academic background in linguistics and language education rather than business or management which created a pronounced prior knowledge gap when engaging with domain-specific business content, making them particularly suitable participants for investigating cognitive load in a CLIL context. Second, the English Course Management course constitutes an authentic CLIL environment, in which English simultaneously functions as the medium of instruction and the subject of learning, while business and management concepts serve as the content where a condition that naturally generates the dual cognitive demands central to this study. Participants were selected via purposive sampling, deliberately choosing individuals who could provide relevant information (Kelly et al., 2010). To capture diverse experiences, the study involved six students (three males and three females) participating in in-depth interviews to ensure a gender-representative sample. Furthermore, to keep their privacy, this article uses their pseudonym, particularly when using the data from them to support our findings.

Three instruments were employed in this study to collect data from multiple sources. First, an 18-item Likert-scale questionnaire (1 = Strongly Disagree to 5 = Strongly Agree) was developed based on CLT and SRL frameworks, divided into two sections: Section 1 (items 1–9) addressing cognitive challenges (RQ1) and Section 2 (items 10–18) addressing self-regulatory strategies (RQ2). The questionnaire was distributed via Google Form. Second, a semi-structured interview protocol consisting of 10 questions was developed bilingually (English and Indonesian) to explore students' experiences in depth, with all sessions audio-recorded and transcribed verbatim. Third, a rubric checklist consisting of five aspects; Text Density, Structure and Flow, Visual Aids, Term Simplification, and Memory Triggers was developed based on CLT and SRL frameworks for document analysis of students' PowerPoint presentations.

Data collection involved multiple methods, including questionnaires, semi-structured interviews, and document analysis of students' PPTs, to achieve data triangulation and minimize systematic bias (Maxwell, 2008). The questionnaires were self-administered to obtain an overview of perceived challenges, giving respondents a comfortable space to answer honestly. The results also provided initial insights to understand the classroom challenges and strategies, guiding the selection of participants for the subsequent in-depth interviews. Thus, semi-structured interviews were conducted to gain detailed insights, allowing exploration of new ideas as they arose. By combining these three data collections, the study achieves a more comprehensive understanding of the phenomenon from the students' perspective. Additionally, all interviews were audio-recorded and transcribed verbatim to ensure an accurate and permanent record of participants' responses.

Data analysis was performed concurrently with data collection, allowing the researchers to continually refine the study focus. The interview transcripts were analyzed through thematic analysis to identify recurring patterns or themes (Caulfield, 2019). This involved coding the data and organizing it into categories. To ensure the reliability of the findings, triangulation was used by comparing patterns across multiple data sources to reduce the risk of misinterpretation.

RESULT AND DISCUSSION

RQ 1: What cognitive challenges do university students encounter throughout the process of delivering oral presentations in a CLIL-based course?

Table 1 presents the mean scores of questionnaire items measuring students' cognitive challenges (RQ1), which organized according to three sub-indicators of Cognitive Load Theory: Intrinsic Load, Extraneous Load, and Transient Information.

Sub-indicator	Item	Mean	Category
Intrinsic Load	1	3.05	Moderate
	2	3.29	Moderate
	3	3.11	Moderate
Extraneous Load	4	3.11	Moderate
	5	3.52	High
	6	3.29	Moderate
Transient Information	7	3.05	Moderate
	8	3.19	Moderate
	9	3.17	Moderate
Sub-indicator mean		3.15	Moderate

Table 1. Mean Scores of Questionnaire Items: RQ1: Cognitive Challenges

Note: Mean scores categorized as: Low (1.00–2.59), Moderate (2.60–3.39), High (3.40–5.00).

3.1 Unfamiliarity with Business/Management vocabulary

As presented in Table 1, items 1–3 measuring Intrinsic Load obtained a mean score of 3.15, categorized as moderate. This suggests that students acknowledge a considerable mental effort when processing domain-specific Business/Management content in English. This finding is also supported by interview data in which all six participants explicitly reported difficulties with business and management vocabulary. As Sarah (F1) stated,

“...I rarely got exposure to business English vocabulary, so it was hard and confusing when explaining it...” (Interview #1, March 5, 2026)

Similarly, William (M1) noted that the curriculum and operational cost section has not yet been understood, and is unfamiliar with it.

“...The curriculum section...the cost planning or operational cost section...there are many business terms in English that I still find difficult because I’m not very familiar with them...” (Interview #3, March 6, 2026)

Analysis of the document further confirmed these results. The Simplification of Terms aspect of the rubric checklist yielded an average score of 2.6 across five participants' presentations, categorized as low. Most participants used technical business terms like "customization," "force manure," and "governance structure" without offering contextual explanations or simpler definitions, showing limited support for understanding vocabulary during the presentation.

These consistent findings support Cognitive Load Theory, which argues that Intrinsic Load rises with increasing complexity and unfamiliarity of the learning material (Roussel et al., 2017). In a CLIL setting, students with an English Education background instead of Business or Management encounter a significant gap in prior knowledge. They must process and pronounce specialized business terminology in a foreign language, which heavily strains their limited working memory resources (Roussel et al., 2017). This finding is consistent with Macaraeg et al., (2024) who noted that CLIL learners often find it challenging to understand unfamiliar technical terminology during academic activities tasks, and with Akay et al., (2025), who identified vocabulary-related challenges as a primary cognitive burden in CLIL-based oral presentations. These findings indicate that pre-presentation vocabulary scaffolding, like bilingual glossaries or specific business term preparation activities, can help decrease students' Intrinsic Load before presentation tasks.

3.2 Dual Processing Burden: Simultaneous Language and Content Management

The questionnaire data showed that items measuring Extraneous Load (items 4–6) had an average score of 3.30, indicating a moderate level (see Table 1). Among these, item 5, which referred to the cognitive challenge of monitoring grammar while delivering content, received the highest mean score of 3.52, indicating that this issue was the most strongly experienced participants.

Interview data further supported this finding, with all six participants reporting a dual cognitive burden when giving their presentations in English. Felly (F2) shared her feelings:

“... I'm feeling a little overwhelmed... I'm having a harder time with management and business terms because a lot of them are unfamiliar to me. And that makes my brain work harder than if I were just thinking about grammar...” (Interview #2, March 5, 2026)

Similarly, Sally (F3) reported the same pattern,

“... I don't really worry about grammar... what's really draining is trying to figure out business terms that are unfamiliar to us...” (Interview #4, March 6, 2026)

A common adaptive pattern among participants was the explicit prioritization of content delivery over grammatical accuracy, suggesting an implicit strategy to conserve limited cognitive resources during presentations.

The analysis of students' PPT slides further supported this theme. The Text Density criterion on the rubric received an average score of 2.25 from five participants, showing that most slides were still text-heavy. This design likely increased extraneous load during presentations because students had to read densely packed slides.

These findings align with Cognitive Load Theory, which suggests that Extraneous Load occurs when learners process information that competes with the primary learning task for limited working memory resources. (Roussel et al., 2017). In a CLIL setting, the dual demands

of tracking grammatical accuracy and generating domain-specific business vocabulary create two competing sources of cognitive load. Both are biologically secondary and are not naturally acquired, which can collectively overwhelm students' working memory capacity (Roussel et al., 2017). Most participants intentionally prioritized content delivery rather than grammatical accuracy. This adaptive approach aligns with the CLIL pedagogical stance, which emphasizes fluency over accuracy in spoken interactions (Villabona & Cenoz, 2022), and is consistent with Chen et al., (2024) finding that CLIL students often encounter cognitive overload when handling both linguistic and content demands at the same time.

3.3 Psychological and Situational Pressure as Cognitive Disruption

The questionnaire data showed that items assessing Transient Information and Processing Pressure (items 7–9) had an average score of 3.05, which falls within the moderate range (see Table 1). Specifically, item 9, which evaluated the stress of rapidly organizing thoughts into English before speaking spontaneously, had the highest mean score of 3.17. In contrast, item 8, related to mental blocks when receiving immediate feedback, recorded the lowest mean of 2.94.

Interview data further confirmed this finding. Nervousness and low self-confidence were the main causes of cognitive disruption during mid-presentation for all participants. Sarah (F1) mentioned that blanking out during presentations was a common occurrence directly associated with anxiety.

“...I’ve definitely had moments where my mind went blank mostly because I was so nervous... I was so nervous that my mind just went blank...” (Interview #1, March 5, 2026)

Furthermore, during spontaneous Q&A sessions, the cognitive load increased even more. David (M3) mentioned feeling overwhelmed when needing to process the lecturer's questions and respond in English at the same time.

“...I was more stressed about finding the right answer because of the difficulty of the question... but I could still ask the lecturer to clarify if I did not understand...” (Interview #6, March 8, 2026)

Unlike the previous two themes, document analysis did not find direct signs of psychological pressure in the PPT slides. However, it is notable that participants with the highest anxiety levels, especially Sarah (F1) and Alden (M3), relied more on slides dense with text and keywords as memory aids. This suggests that slide design might have been used as a compensatory strategy to reduce the risk of forgetting during their presentation.

The psychological and situational pressure described here can be seen as a consequence of the cognitive load built up in Themes 1 and 2. When the combined Intrinsic and Extrinsic Load surpasses students' working memory capacity, it causes cognitive overload, which then shows up as nervousness, blanking out mid-presentation, and increased stress during spontaneous Q&A sessions. (Roussel et al., 2017). This is especially noticeable in the fleeting quality of spoken information, which becomes harder to remember and retrieve when working memory is strained by the dual tasks of handling unfamiliar vocabulary and ensuring language accuracy. (Roussel et al., 2017). These findings are consistent with Akay et al., (2025) and Mihaljević Djigunović (2004), who identified psychological barriers, such as foreign language anxiety and fear of negative evaluation, as major cognitive disruptors in CLIL-based oral presentation contexts.

RQ 2: How do university students employ self-regulatory strategies across the forethought, performance, and self-reflection phases to manage their oral presentations?

Table 2 presents the mean scores of questionnaire items measuring students' self-regulatory strategies (RQ2), which organized according to three sub-indicators of Self-Regulated Learning Theory: Forethought Phase, Performance Phase, and Self-Reflection Phase.

Sub-indicator	Item	Mean	Category
Forethought Phase	10	3.58	High
	11	3.47	High
	12	3.58	High
Performance Phase	13	3.94	High
	14	3.29	Moderate
	15	3.52	High
Self-Reflection Phase	16	3.64	High
	17	3.58	High
	18	3.88	High
Sub-indicator mean		3.70	High

Table 2. Mean Scores of Questionnaire Items: RQ2: Self-Regulatory Strategies

Note: Mean scores categorized as: Low (1.00–2.59), Moderate (2.60–3.39), High (3.40–5.00).

3.4 Forethought Strategies: Proactive Preparation and Goal Setting

The questionnaire data showed that items measuring the Forethought Phase (items 10–12) had a mean score of 3.54, classified as high (see Table 4). Item 10 covering the use of notes or outlines before presentations and item 12 about pre-studying technical management terms to lower cognitive overload, both achieved the highest mean scores of 3.58. This suggests that proactive vocabulary preparation was the most consistently employed forethought strategy among participants.

Interview data strongly supported this finding. All six participants stated they used proactive preparation strategies before their presentations, though their methods differed. Sarah (F1) outlined a content-focused approach, highlighting the importance of understanding the material and anticipating vocabulary:

“...Make sure you really understand the material so you don't get lost in translation in front of the class... highlight any business vocabulary you're not familiar with so you don't forget it...”

Concerning goal setting, five of the six participants explicitly chose to prioritize audience understanding over linguistic fluency. This indicates a deliberate self-regulatory choice to lower performance pressure. As Felly (F2) mentioned,

“...My goal with this presentation is primarily to ensure the audience understands, rather than simply going through the motions...”

Only Sally (F3) reported prioritizing fluency, viewing it as a means of projecting content mastery and personal confidence.

Document analysis further supported evidence of self-regulation in the forethought phase. The rubric's Structure and Flow category received the highest average score (mean = 4.0) among all five participants. Four out of five PPTs included a clear content outline, logical section order, and a closing summary slide, indicating intentional pre-presentation planning. Notably, F3's presentation started with a 16-item Content Index, showing the most systematic structural planning among all.

The forethought strategies discussed here represent the initial stage of the SRL cycle as outlined by Zimmerman & Moylan (2009), where learners analyze tasks and reflect on their self-motivation beliefs before perform in front of the class. Participants' proactive behaviors, like pre-studying business vocabulary, creating outlines, and highlighting unfamiliar terms, serve as deliberate cognitive load reduction methods. These actions shift some processing effort from the presentation to the preparation phase, thereby decreasing the Intrinsic Load as noted in Theme 1. (Panadero, 2017; Roussel et al., 2017). The fact that five of six participants chose audience comprehension over linguistic fluency highlights an adaptive self-motivation belief within the forethought phase, aligning with Fitriana's (2023) and Wilang (2022) observations indicate that students use strategic goal-setting to handle performance pressure during oral presentations.

3.5 Performance Phase: Real-Time Coping and Help-Seeking

The data from the questionnaire showed that items related to the Performance Phase (items 13–15) had an average score of 3.58, which is considered high (see Table 5). Item 13, about using hand gestures to clarify complex information, had the highest average of 3.94, indicating that non-verbal cues were the most common coping strategy in real-time. Item 15, about intentionally slowing down speech to allow for processing, also scored high with an average of 3.52. Meanwhile, item 14, which involved seeking help from friends or lecturers, received a moderate average score of 3.29.

Interview data showed that participants used a variety of real-time coping strategies during presentations when facing cognitive overload. The most common method was using PPT slides as a key memory aid. Felly (F2) explained that she depended on her slides when she encountered difficulties:

“...When I feel stuck, I immediately glance at the PPT on the screen and look for the part that is missing...”

While William (M1) reported using visible keywords to trigger recall:

“...What I do most often is pay attention to the keywords on the PPT so that I can re-deliver the material that momentarily slipped my mind...”

In terms of help-seeking, participants who presented individually mainly relied on their own slides, whereas those in group settings frequently sought assistance from peers.

The document analysis supported the performance-phase strategies identified from the interview data. The Memory Trigger component of the rubric scored an average of 3.4 across five participants, with William (M1) and Sally (F3) achieving the highest scores of 4, both of whom systematically used numbered headings, bolded keywords, and section dividers as intentional memory aids during their presentations. Additionally, the Visual Aid component averaged 3.2, with Sarah (F1), Sally (F3), and Alden (M3) frequently utilizing diagrams, photographs, and infographics to offset verbal shortcomings during delivery.

This theme's real-time coping strategies correspond to the Performance Phase of the SRL cycle, where learners utilize self-control and self-observation techniques to sustain task performance under pressure. (Zimmerman & Moylan, 2009). The widespread use of PPT slides as memory aids can be seen as an external cognitive resource to offset the limited working memory capacity described in Theme 3. This approach effectively offloads some of the cognitive load caused by fleeting spoken information (Roussel et al., 2017). Importantly, help-seeking behavior seemed to depend on the context which individuals working alone relied solely on their own slides due to concerns that peers might not understand their specific content. In contrast, participants in group settings actively asked for peer assistance, indicating that self-regulatory behavior during the performance phase is influenced by the situation rather than being fixed. This pattern consistent with Wilang's (2022) and Abdurahman and Rizqi's (2020) findings related to students' utilization of external resources and peer support to handle cognitive and affective challenges during oral presentations.

3.6 Post-Presentation Reflection and Adaptive Strategy Planning

The data from the questionnaire showed that the items related to the Self-Reflection Phase (items 16–18) had the highest average score among all sub-indicators in RQ2, with a mean of 3.70, classified as high (see Table 6). Item 18, which involved organizing new steps like learning specific terms for upcoming presentations, had the highest mean of 3.88. In comparison, item 16, which focused on comparing oneself to personal goals after a presentation, had a mean of 3.64. These findings indicate that self-reflection and adaptive planning were the most actively employed self-regulatory behaviours by the participants.

Interview data strongly supported this conclusion. All six participants reflected after their presentations and outlined specific strategies for future improvement. Sally (F3) described a detailed preparation timeline as part of her reflective planning:

“...Ideally, the PPT should be ready five days before the presentation, and the remaining time can be used to study the material and practice speaking...”

Alden (M3) similarly highlighted the significance of achieving deeper mastery of the material and maintaining consistent practice as his main point of reflection.

“...I need to be more dedicated in mastering the material... I also need to practice more frequently so that I can memorize the content and deliver the presentation more fluently...”

Similar to Theme 3, the document analysis did not show clear signs of self-reflection in the PPT slides, as this typically happens after the presentation. However, participants' interview responses, particularly their remarks on preparation, note-taking of vocabulary, and effort to reduce text density, suggest potential areas for improvement. These could become more evident in future presentation materials if a longitudinal study is conducted.

This theme's post-presentation self-evaluation and adaptive planning illustrate the Self-Reflection Phase of the SRL cycle, where learners assess their performance through self-judgment and self-reaction against their personal goals. (Zimmerman & Moylan, 2009). The Self-Reflection Phase received the highest average score among all sub-indicators ($M = 3.70$), indicating that participants were most engaged during this stage. This reflects strong metacognitive awareness, demonstrated by their identification of specific strategies such as earlier preparation, focused vocabulary note-taking, and more frequent practice. This finding is consistent with those of Fitriana (2023) and Abdurahman and Rizqi (2020). They noted that students participating in oral presentations often reflect on their performance and adjust their strategies for future improvement. This indicates that self-reflection is a natural part of students' self-regulation skills in CLIL-based settings.

CONCLUSION

This study investigated the cognitive challenges and self-regulatory strategies of university students during oral presentations in a CLIL-based English Course Management class. With regard to RQ1, three interrelated cognitive challenges were identified: unfamiliarity with business and management vocabulary as the primary source of Intrinsic Load, the dual processing burden of simultaneously managing language accuracy and content delivery as a source of Extraneous Load, and psychological pressure as a downstream consequence of accumulated cognitive overload. With regard to RQ2, three self-regulatory strategy clusters were identified across the SRL cycle: proactive forethought strategies, real-time performance strategies, and post-presentation self-reflection. Collectively, these findings demonstrate that Cognitive Load Theory and Self-Regulated Learning Theory function as complementary frameworks for understanding students' experiences in CLIL-based oral presentation contexts. Based on these findings, CLIL instructors are encouraged to incorporate pre-presentation vocabulary scaffolding activities to reduce students' Intrinsic Load prior to delivery. Students are recommended to develop more systematic self-regulatory practices, particularly in the forethought phase.

Several limitations of this study should be acknowledged. First, the study involved only six participants from a single course at one university, which restricts the applicability of the results to broader CLIL settings or other institutional contexts. Second, since data were mainly gathered through self-report tools like questionnaires and interviews, the findings may be influenced by social desirability bias or inaccuracies in participants' memory of their presentation experiences. Third, document analysis was performed on five of the six participants' presentations, as one participant's PPT file was lost, potentially impacting the thoroughness of the triangulation process. Future research may replicate this study with a larger sample to enhance generalizability or adopt a longitudinal design to examine how self-regulatory strategies develop across successive presentation tasks.

Declaration of AI Use

The authors use AI tools for some aspects, including conceptualizing and structuring the initial outline for all sections, translating the interview transcripts, refining the theoretical framework, and organizing the interview findings. However, the final analysis, data interpretation, and overall manuscript were performed by the authors. Thus, the authors are fully responsible for the accuracy and integrity of this article.

REFERENCES

- Ab Halim, R., Ab Halim, N., & Teknologi MARA Bandar Tun Abdul Razak Jengka, U. (2013). Investigating Learning Difficulties in Economics English-Medium Classes among Malay Students. In *GADING BUSINESS AND MANAGEMENT JOURNAL* (Vol. 17, Number 1).
- Abdurahman, N. H., & Rizqi, M. A. (2020). Indonesian students' strategies to cope with foreign language anxiety. *Teflin Journal*, 31(1), 1–18. <https://doi.org/10.15639/teflinjournal.v31i1/1-18>
- Akay, E., Yılmaz, B., & Yüncü, H. R. (2025). A CLIL-based model proposal for a solution to English-speaking anxiety of gastronomy and culinary arts students. *Journal of Hospitality, Leisure, Sport and Tourism Education*, 36. <https://doi.org/10.1016/j.jhlste.2025.100559>
- Caulfield, J. (2019). *How to do Thematic Analysis When to use thematic analysis*.
- Chen, Z., Zhang, P., Lin, Y., & Li, Y. (2024). Interactions of trait emotional intelligence, foreign language anxiety, and foreign language enjoyment in the foreign language speaking classroom. *Journal of Multilingual and Multicultural Development*, 45(2), 374–394. <https://doi.org/10.1080/01434632.2021.1890754>
- Chien, M.-Y., & Valcke, M. (2020). A Study of the Difficulties and Instructional Support Related to Spoken Interaction in an EMI Course for Higher Education Students. *Journal of Educational Research and Practice*, 10(1). <https://doi.org/10.5590/jerap.2020.10.1.09>
- Fitriana, I. (2023). STRATEGIES FOR COPING ANXIETY BY THE STUDENTS IN CONDUCTING ORAL PRESENTATIONS. *SPHOTA: Jurnal Linguistik Dan Sastra*, 15(2), 133–142. <https://doi.org/10.36733/sphota.v15i2.7569>
- Fujimura, T. (2018). *A multimodal discourse analysis of student explanations in content and language integrated learning*.
- Gaballo, V. (2023). Translation in CLIL: Mission impossible? *Translation and Translanguaging in Multilingual Contexts*, 9(1), 71–94. <https://doi.org/10.1075/ttmc.00102.gab>
- Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: Interviews and focus groups. *British Dental Journal*, 204(6), 291–295. <https://doi.org/10.1038/bdj.2008.192>

- Hadi, M. J., Rizka, B. H., & Tarmizi, T. (2020). *"I Feel Nervous and Lose My Ideas When Having Presentation": Mapping Senior Students' Challenges in Academic Oral Presentation in English*.
- Hast, M. (2025). Presentation Skills in Distance Education: A Proposal for a Five-Session Course. *Higher Education Studies*, 15(2), 165–173.
- Hu, H. (2024). Teachers and students at the crossroads: unpacking L1 use in CLIL in China's higher education. *Journal of Multilingual and Multicultural Development*.
<https://doi.org/10.1080/01434632.2024.2435989>
- Kelly, S. E., Bourgeault, I., & Dingwall, R. (2010). Qualitative interviewing techniques and styles. *The SAGE Handbook of Qualitative Methods in Health Research*, 19, 307–326.
- Liu, J.-C., Chen, C.-T., Lee, C., & Huang, S.-H. (2024). Evolving Knowledge Graph Representation Learning with Multiple Attention Strategies for Citation Recommendation System. *ACM Transactions on Intelligent Systems and Technology*, 15(2), 1–26. <https://doi.org/10.1145/3635273>
- Macaraeg, J. M., Gallego, M. C., Ferrera, R. E., & Ulla, M. B. (2024). Content and language integrated learning (CLIL): Experiences and challenges of English preparatory school graduates in a Cambodian international university. *Social Sciences and Humanities Open*, 10. <https://doi.org/10.1016/j.ssaho.2024.101165>
- Maxwell, J. A. (2008). Designing a qualitative study. *The SAGE Handbook of Applied Social Research Methods*, 2(7).
- Mihajlov, T. (2023). Automatic Student Answer Assessment Using LSA. In H. A.H., T. A.R., M. R., R. R., R. R., Z. P., & S. S. (Eds.), *Computational Terminology in NLP and Translation Studies, ConTeNTS 2023 - Incorporating the 16th Workshop on Building and Using Comparable Corpora, BUCC 2023, associated with 14th International Conference on Recent Advances in Natural Language Processing* (pp. 36–44). Incoma Ltd. https://doi.org/10.26615/978-954-452-090-8_005
- Mihaljević Djigunović, J. (2004). Beyond language anxiety. *Studia Romanica et Anglica Zagrabienis: Revue Publiée Par Les Sections Romane, Italienne et Anglaise de La Faculté Des Lettres de l'Université de Zagreb*, 49, 201–212.
- Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. In *Frontiers in Psychology* (Vol. 8, Number APR). Frontiers Media S.A.
<https://doi.org/10.3389/fpsyg.2017.00422>
- Roussel, S., Joulia, D., Tricot, A., & Sweller, J. (2017). Learning subject content through a foreign language should not ignore human cognitive architecture: A cognitive load theory approach. *Learning and Instruction*, 52, 69–79.
<https://doi.org/10.1016/j.learninstruc.2017.04.007>
- Sampaio, C., Régio, M., & Morgado, M. (2021). Implementing Integrated Content and Language in Higher Education in Accounting Classes: Implication for International

- Business Teaching. *Journal of Teaching in International Business*, 32(3–4), 236–261.
<https://doi.org/10.1080/08975930.2022.2033668>
- Subon, F., & Tarmim, S. S. M. (2021). The Code-Switching Phenomenon during Oral Presentations among the Business Programme Students. *IAFOR Journal of Education*, 9(5), 85–100.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285.
- Villabona, N., & Cenoz, J. (2022). The integration of content and language in CLIL: a challenge for content-driven and language-driven teachers. *Language, Culture and Curriculum*, 35(1), 36–50.
- Wilang, J. D. (2022). Specific Anxiety Situations and Coping Strategies in Full English Medium Instruction Engineering Programs. *International Journal of Engineering Pedagogy*, 12(6), 70–84. <https://doi.org/10.3991/ijep.v12i6.33453>
- Zhang, Y., Bhattacharyya, E., Wan, Z., & Hou, L. (2025). Application and Challenges of CLIL in English Language Oral Teaching in a Bilingual Fashion Design Course. *Environment-Behaviour Proceedings Journal*, 10(31), 97–103.
<https://doi.org/10.21834/e-bpj.v10i31.6541>
- Zimmerman, B. J., & Moylan, A. R. (2009). Self-regulation: Where metacognition and motivation intersect. In *Handbook of metacognition in education* (pp. 299–315). Routledge.