



## Deep Learning–Oriented Speaking Instruction: The Role of Memory, Cognitive, and Compensation Strategies in EFL

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### Abstract

*This study examines memory, cognitive, and compensation strategies in deep learning–oriented English-speaking instruction within an EFL context. Grounded in Oxford’s direct language learning strategy framework and deep learning pedagogy, speaking is conceptualized as a cognitively and strategically regulated process. Memory strategies facilitate encoding and retrieval, cognitive strategies support the processing and organization of ideas, and compensation strategies enable learners to sustain communication under constraints. The study aims to analyze how these strategies are enacted and interact in learners’ speech production and to explain their contributions to fostering deeper, more reflective, and more autonomous speaking practices. Adopting a qualitative descriptive design, data were collected through classroom observations and semi-structured interviews involving 34 English Literature students at Universitas Negeri Makassar (UNM), cohort 2024, Class A. The findings indicate that memory strategies support lexical retrieval and fluency, cognitive strategies facilitate idea development and discourse organization, and compensation strategies help learners manage communicative pressure and maintain interactional flow. Importantly, the interaction among these strategies promotes deeper engagement in speaking tasks, reflecting key principles of deep learning. The study suggests that deep learning–oriented speaking instruction, aligned with Kurikulum Merdeka, should explicitly integrate strategy-based pedagogy to support reflective, autonomous, and meaningful oral communication. These findings contribute to EFL pedagogy by demonstrating how language learning strategies function collectively to support sustainable speaking development in higher education contexts.*

**Keywords:** *Compensation Strategies; Deep Learning Pedagogy; EFL Speaking; Memory Strategies; Cognitive Strategies*

### 1. Introduction

In Indonesia, the implementation of the *Kurikulum Merdeka* has brought a paradigm shift toward learner autonomy, reflective practice, and meaningful learning experiences (Halim, 2024). Language learning has increasingly been conceptualized in applied linguistics within constructivist and deep learning frameworks as a process that extends beyond surface-level mastery of forms, involving active meaning construction, self-regulated learning, and the flexible transfer of knowledge across communicative contexts. This orientation aligns closely with deep learning pedagogy, which emphasizes deep cognitive engagement, meaningful processing, self-regulation, and transfer of learning (Andayanie et al., 2025). Within speaking instruction, deep learning requires learners to move beyond memorized utterances toward thoughtful, strategic, and purposeful oral communication.

Speaking is a core component of communicative competence in English as a Foreign Language (EFL), particularly in higher education where students are expected to participate in academic discussions, presentations, and critical exchanges of ideas. Speaking performance requires learners to engage in complex and simultaneous processes, including idea conceptualization, lexical retrieval, discourse organization, and real-time self-monitoring (Zhang & Wilson, 2023). Due to these demands,

speaking is often perceived as the most challenging language skill, even among English Literature students who possess substantial exposure to English texts and theories (Zhang, 2023). This complexity indicates that effective speaking performance cannot be explained solely by linguistic knowledge but must also consider learners' strategic engagement in learning and communication.

To engage deeply in speaking tasks, learners rely on direct language learning strategies, particularly memory, cognitive, and compensation strategies as proposed in Oxford's framework (Oxford, 2016). Memory strategies support the encoding, storage, and retrieval of language through techniques such as association, grouping, imagery, and contextual recall, which are crucial for fluent lexical access during speaking (Al-Faris & Jasim, 2021). Cognitive strategies, including practicing, analyzing, and reasoning (Mayer, 1996), memorizing, taking notes, and creating structured input and output, enable learners to process linguistic information, organize ideas, and construct coherent spoken discourse (Pawlak, 2018; Rasheed & Zafar, 2023). These strategies directly facilitate deep processing of language, a key characteristic of deep learning (Di Carlo, 2017; Wilawan, 2012).

However, speaking tasks often involve communicative pressure, limited linguistic resources, and unpredictable interactional demands, as documented in second language acquisition research on communication strategies and speech production (e.g., (Awang et al., 2022; Chou, 2024; Levelt, 1999). In such conditions, learners are argued to activate compensation strategies to sustain communication and regulate performance. Recent research conceptualizes compensation strategies not merely as techniques for overcoming linguistic gaps, but as self-regulatory actions that involve centering learning goals, monitoring speaking performance, and arranging or planning responses in real time (Teng, 2020). Within a deep learning-oriented instructional context, these strategies enable learners to remain engaged, reflective, and adaptive during speaking activities, rather than disengaged or inhibited by difficulties.

Deep learning in higher education has increasingly been emphasized as a pedagogical orientation that moves beyond surface-level knowledge acquisition toward meaningful understanding, critical reflection, and learner autonomy (Biggs et al., 2022; Mathew et al., 2020). Within this framework, learning is designed to engage students in active knowledge construction, encouraging them to connect concepts, apply understanding across contexts, and regulate their own learning processes. In EFL contexts, such an orientation has significant implications for speaking instruction, which is no longer treated merely as the production of grammatically correct utterances but as a complex, cognitively mediated activity requiring strategic engagement (Kelleher, 2019). Accordingly, curriculum design plays a crucial role in facilitating deep learning-oriented speaking by integrating tasks that promote interaction, reflection, and problem-solving, while also supporting the development of learners' strategic competence. In this sense, the incorporation of memory, cognitive, and compensation strategies becomes essential, as these strategies enable learners to manage linguistic limitations, sustain communication, and engage more deeply in speaking tasks within meaningful and authentic learning environments.

Despite the substantial body of research on language learning strategies, much of the existing literature relies heavily on questionnaire-based methods, thereby offering limited insight into the dynamic and context-sensitive nature of strategy use in authentic speaking instruction. (Plonsky & Kim, 2016). Moreover, studies that integrate

memory, cognitive, and compensation strategies within a deep learning-oriented speaking context remain scarce, particularly in Indonesian higher education settings implementing *Kurikulum Merdeka*. There is still a lack of qualitative evidence capturing how these strategies interact during real classroom speaking activities and how they contribute to meaningful learning.

Previous research has consistently highlighted the importance of language learning strategies in supporting EFL speaking development. Studies across different contexts have shown that memory and cognitive strategies facilitate lexical retrieval, fluency, and discourse organization, while compensation and regulatory strategies help learners manage communicative breakdowns and performance anxiety during speaking tasks (Oxford, 2016; Zhang et al., 2021). Research conducted in China and Iran further indicates that learners who actively plan, monitor, and adjust their speech demonstrate higher levels of speaking effectiveness and strategic awareness (Behroozian et al., 2025; Zhang et al., 2022). Moreover, comparative studies in Asian and Middle Eastern EFL contexts reveal that effective speakers tend to employ multiple strategies in combination, rather than relying on a single strategy type (Kashefian-Naeeni & Maarof, 2022). However, despite these findings, prior studies have largely examined strategy use through survey-based methods and have rarely explored how memory, cognitive, and compensation strategies interact within deep learning-oriented speaking instruction, particularly in higher education contexts implementing *Kurikulum Merdeka*.

Addressing this gap, the present study investigates the dynamic interplay of memory, cognitive, and compensation strategies in deep learning-oriented English-speaking instruction through classroom observation and semi-structured interviews with English Literature students at Universitas Negeri Makassar. While previous studies have primarily examined language learning strategies in isolation or within controlled instructional settings, limited attention has been given to how these strategies interact in authentic classroom speaking tasks, particularly within deep learning-oriented pedagogical frameworks. Moreover, empirical evidence from Indonesian higher education contexts remains underexplored, despite ongoing curriculum reforms such as *Kurikulum Merdeka* that emphasize learner autonomy, reflection, and meaningful engagement. By examining how these strategies are enacted and interconnected during speaking activities, this study seeks to contribute to a more context-sensitive and strategy-integrated model of EFL pedagogy that supports autonomous, reflective, and meaningful oral communication in higher education.

## 2. Method

This study employed a qualitative descriptive research design (Lambert & Lambert, 2012) to explore how memory, cognitive, and compensation strategies function in deep learning-oriented English-speaking instruction. A qualitative approach was chosen to capture learners' strategic behaviours, cognitive engagement, and self-regulatory processes as they naturally occur during speaking activities, rather than to measure strategy use quantitatively or establish causal relationships.

The study was conducted in an English-speaking course within the English Literature Program at Universitas Negeri Makassar (UNM), which is implemented in accordance with the principles of *Kurikulum Merdeka*, emphasizing learner autonomy,

reflection, and meaningful learning. The participants initially consisted of 34 undergraduate students from the 2024 cohort (Class A), all of whom were involved in the classroom observations to capture the overall learning context. However, for the interview phase, a purposive sampling technique was employed to select 10 students who demonstrated varying levels of speaking performance and strategic engagement during classroom activities. This selection aimed to obtain in-depth and diverse insights into how memory, cognitive, and compensation strategies were enacted in speaking tasks. To ensure confidentiality and anonymity, the selected participants were coded as S1 to S10.

The speaking instruction observed in this study was deep learning-oriented, characterized by learning activities that encouraged students to engage deeply with meaning rather than surface-level language practice. These activities included guided discussions, short academic presentations, reflective oral responses, and collaborative speaking tasks. Students were required to plan their ideas, organize discourse, reflect on performance, and regulate their speaking processes, creating conditions for the natural emergence of memory, cognitive, and compensation strategies.

The study was guided by Oxford’s direct language learning strategy framework (Oxford, 2016), focusing on three types of strategies and their specific aspects related to speaking:

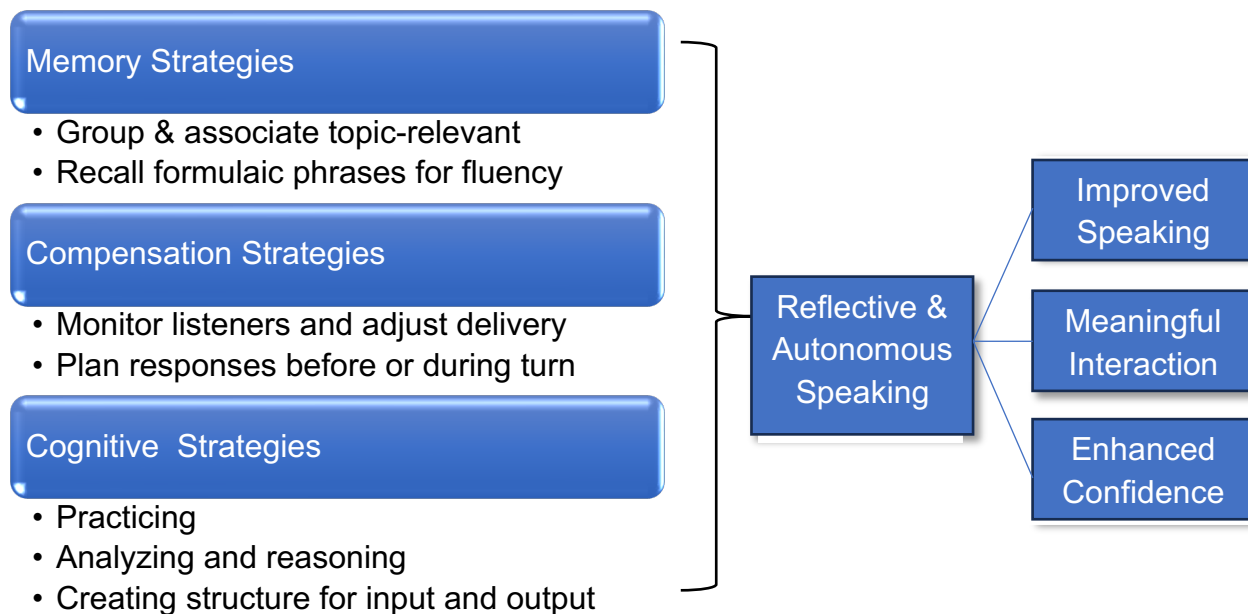
**Table 1.** Oxford’s direct language learning strategy

No	Kinds of Strategy	Aspects of Strategy
1	Memory	Grouping; associating new language with prior knowledge; imagery; contextual recall
2	Cognitive	Practicing; analyzing and reasoning; memorizing; taking notes; creating structure for input and output
3	Compensation	Centering learning goals; monitoring speaking performance; arranging and planning responses

Memory strategies supported lexical encoding and retrieval, cognitive strategies facilitated language processing and discourse organization, and compensation strategies functioned as self-regulatory mechanisms that enabled learners to sustain communication under communicative pressure. Together, these strategies were examined in relation to speaking performance within a deep learning-oriented instructional context. Here is the integrated strategic framework.

This framework illustrates how memory, cognitive, and compensation strategies function as direct language learning strategies within deep learning-oriented English-speaking instruction. Memory strategies support learners’ lexical access and recall, enabling them to retrieve relevant vocabulary and formulaic expressions efficiently (Nemati, 2009). Cognitive strategies facilitate meaning construction and discourse organization through rehearsal, analysis, note-taking, and structuring spoken input and output. Compensation strategies operate as self-regulatory mechanisms, allowing learners to monitor performance, plan responses (Karbalaee & Negin Taji, 2014; Shakarami et al., 2017), and sustain communication despite linguistic limitations. The interaction of these strategies promotes reflective and autonomous speaking, leading to improved fluency, meaningful interaction, and confidence—key outcomes aligned with the principles of deep learning pedagogy and *Kurikulum Merdeka*.

**Diagram 1.** Strategic Framework for Deep Learning in EFL Speaking



Data were collected through classroom observation and semi-structured interviews. Classroom observations were conducted to document students' real-time use of memory, cognitive, and compensation strategies during speaking activities. An observation guide was developed based on the strategy aspects listed above, focusing on indicators such as vocabulary recall, rehearsal practices, discourse structuring, performance monitoring, and strategic planning. Semi-structured interviews were conducted with selected participants to explore students' reflections on their speaking processes and the strategies they employed. The interviews aimed to elicit learners' awareness of how memory, cognitive, and compensation strategies supported deep learning and speaking performance.

The data were analyzed using thematic analysis following a systematic coding procedure (Castleberry & Nolen, 2018; Khokhar et al., 2020). Observation notes and interview transcripts were first transcribed and organized, after which initial coding was conducted both deductively, guided by predefined categories of memory, cognitive, and compensation strategies, and inductively to capture emerging patterns from the data. The coding process involved multiple stages, including familiarization with the data, generation of initial codes, categorization, and theme development, allowing for the identification of patterns related to how strategies were enacted during speaking tasks. Particular attention was given to examining the dynamic interaction among strategies and their contribution to learners' speaking performance and engagement.

To enhance the trustworthiness of the findings, several strategies were employed. Data triangulation was achieved by comparing insights from classroom observations and semi-structured interviews to ensure consistency and depth of interpretation. Member checking was conducted by sharing selected interpretations with participants to confirm the accuracy of the findings. In addition, coding decisions were documented to maintain an audit trail, ensuring transparency and replicability of the analytical process

### 3. Results

The data for this study were collected from a second-semester English speaking class in the English Literature Program at Universitas Negeri Makassar. The speaking instruction was conducted under a deep learning-oriented approach, emphasizing meaning construction, reflection, and learner autonomy in line with *Kurikulum Merdeka*. Classroom observations were carried out across four consecutive speaking meetings, each centered on academic themes such as *expressing opinions on social issues, responding to literary topics, and reflective discussion based on short readings*.

#### 3.1 Findings

During these sessions, students participated in guided discussions, short individual presentations, and spontaneous question-and-answer activities. Non-participant observations were used to document students' strategic behaviors before and during speaking tasks. To complement observational data, semi-structured interviews were conducted with 10 selected students, chosen through maximum variation sampling based on observed differences in fluency, confidence, and participation levels. The interviews aimed to elicit students' reflections on how they prepared for speaking, managed difficulties, and regulated their performance during class interaction.

**Table 2.** Memory, Cognitive, and Compensation Strategies in Deep Learning-Oriented Speaking Instruction

Strategy Type	Strategy Aspects	Observed Functions in Speaking	Impact on Speaking Performance	Empirical Evidence from Class
Memory	Grouping, associating, contextual recall	Enables faster lexical retrieval and recall of expressions relevant to the topic	Reduced hesitation; improved initial fluency	Obs: Students began speaking turns with fewer pauses after reviewing grouped keywords.  Interview (S7): "I remember vocabulary better when I connect it with the topic we discussed before, so I don't panic when I start speaking."
Memory	Imagery, formulaic recall	Supports retrieval of chunks and familiar expressions	Smoother transitions between ideas	Obs: Students reused familiar phrases such as " <i>In my opinion</i> " and " <i>What I want to highlight is...</i> " fluently.  Interview (S12): "I imagine the discussion

				like the previous class, so the sentences come automatically.”
Cognitive	Practicing (rehearsal)	Prepares learners mentally and linguistically before speaking	Increased fluency and confidence	Obs: Several students rehearsed quietly or mouthed sentences before taking turns.  Interview (S3): “I always practice the sentence in my head before speaking, so I feel more confident.”
Cognitive	Analyzing and reasoning	Helps organize ideas and select appropriate language forms	More coherent and logical discourse	Obs: Students paused briefly to restructure sentences rather than stopping completely.  Interview (S18): “I think about the structure first, so my explanation is not random.”
Cognitive	Note-taking, structuring input/output	Supports discourse organization and clarity of ideas	Clearer argument flow and topic development	Obs: Students referred to brief notes containing keywords, not full sentences.  Interview (S9): “I write only key points, then explain them in my own words.”
Compensation	Centering learning goals	Maintains focus on meaning rather than grammatical perfection	Sustained communication despite errors	Obs: Students continued speaking despite minor grammatical mistakes.  Interview (S21): “I focus on delivering the idea first, grammar can be corrected later.”
Compensation	Monitoring performance	Enables self-correction and adjustment during speaking	Improved intelligibility and interaction	Obs: Students reformulated sentences after noticing listener confusion.  Interview (S5): “When I see my friends don’t understand, I try to

				explain again differently.”
Compensation	Arranging and planning responses	Helps manage spontaneous questions and turn-taking	Reduced anxiety; smoother interaction	Obs: Students paused briefly to plan responses instead of avoiding questions.  Interview (S14): “I don’t answer immediately; I arrange my idea first so I don’t get stuck.”

These findings demonstrate that memory, cognitive, and compensation strategies function as directive strategies that operationalize deep learning in speaking. Memory strategies enable deep encoding and retrieval of language, cognitive strategies support meaning construction and discourse organization, and compensation strategies facilitate self-regulation during real-time communication. Together, these strategies allow learners to engage reflectively and autonomously in speaking tasks—key characteristics of deep learning and central goals of *Kurikulum Merdeka*.

In classroom practice, the use of memory strategies was particularly evident at the initial stages of speaking tasks. Before taking speaking turns, students frequently relied on grouping key vocabulary, recalling familiar expressions, and associating new topics with previously discussed themes. Observation data showed that students who engaged in such memory-based preparation were able to initiate their speech with fewer hesitations and pauses. During interviews, several students explained that recalling expressions used in earlier discussions or presentations helped them feel more confident and reduced anxiety at the beginning of speaking. This indicates that memory strategies functioned as a foundation for lexical access and fluency, enabling learners to engage more smoothly in oral communication within a deep learning-oriented environment.

As speaking activities progressed, cognitive strategies became more prominent in shaping the structure and clarity of students’ oral production. Students were observed rehearsing ideas silently, organizing key points through brief notes, and reasoning through sentence construction while speaking. Rather than memorizing full scripts, most students relied on keywords and mental outlines to guide their speech. This strategic behavior resulted in more coherent explanations and logically connected ideas. Interview data further revealed that students consciously analyzed how to express ideas clearly and adjusted their language choices to match the discussion context. These findings suggest that cognitive strategies supported deeper processing of meaning and discourse organization, reflecting the core principles of deep learning pedagogy.

During spontaneous interaction and question-and-answer sessions, compensation strategies played a crucial regulatory role. When students encountered difficulties such as limited vocabulary or uncertainty in grammatical forms, they employed strategies such as centering their focus on conveying the main idea, monitoring listeners’ reactions, and briefly planning responses before speaking. Observations showed that students often reformulated sentences or clarified ideas

after noticing signs of misunderstanding from peers. Interview responses indicated that this strategic regulation helped students maintain communicative flow and manage speaking anxiety. Within a deep learning–oriented instructional context, these compensation strategies allowed learners to remain engaged and reflective rather than withdrawing from interaction.

Importantly, the findings demonstrate that these strategies were rarely used in isolation. Memory, cognitive, and compensation strategies interacted dynamically throughout the speaking process. Memory strategies supported access to linguistic resources, cognitive strategies organized and elaborated meaning, and compensation strategies regulated performance in real time. This interaction enabled students to prioritize meaningful communication over linguistic perfection, resulting in increased confidence and sustained participation. Such strategic integration aligns with the goals of *Kurikulum Merdeka*, which emphasizes learner autonomy, reflective learning, and meaningful engagement.

Overall, the narrative evidence from classroom observations and interviews illustrates that deep learning–oriented speaking instruction provides a pedagogical space in which strategic language use naturally emerges. Students' ability to flexibly combine memory, cognitive, and compensation strategies contributed to more confident, coherent, and purposeful speaking performance, highlighting the importance of explicitly fostering strategy awareness in EFL speaking instruction.

### 3.2 Discussion

The findings of this study indicate that memory, cognitive, and compensation strategies operate in a complementary and interconnected manner to support students' English-speaking performance within a deep learning–oriented instructional context. This pattern aligns with Oxford's framework of direct language learning strategies, which emphasizes that effective language use emerges from the coordinated deployment of multiple strategies rather than isolated strategy use (Oxford, 2016). The dynamic combination of strategies observed in this study reflects learners' strategic self-regulation, where memory supports access to linguistic resources, cognitive strategies shape meaning construction, and compensation strategies regulate performance in real time.

From a deep learning pedagogy perspective, the interaction of these strategies demonstrates how speaking tasks can foster deep cognitive engagement rather than surface-level practice. Deep learning emphasizes meaningful processing, reflection, and learner autonomy, all of which were evident when students actively recalled relevant language, organized ideas, and adjusted their speech based on communicative demands. The findings suggest that deep learning–oriented speaking instruction provides a pedagogical space that naturally elicits strategic behavior, enabling learners to focus on meaning-making instead of mere accuracy.

The present findings are consistent with international research on L2 speaking strategies. Studies conducted in China and other EFL contexts have shown that learners' speaking performance improves when strategic regulation—such as planning, monitoring, and problem-solving—is actively employed during speaking tasks (Zhang et al., 2021; Zhang et al., 2022). Similarly, comparative studies involving EFL learners in Iran and Malaysia report that effective speakers tend to use multiple strategies flexibly to manage task difficulty and communicative pressure (Kashefian-Naeeni & Maarof, 2022). These studies support the current finding that strategic

integration, rather than reliance on a single strategy type, is crucial for successful speaking.

Overall, this study extends previous research by situating Oxford's direct strategies within a deep learning-oriented speaking framework aligned with *Kurikulum Merdeka* (Azzahra & Rahmadhani, 2025). The findings suggest that EFL speaking instruction should explicitly scaffold memory, cognitive, and compensation strategies to promote reflective, autonomous, and meaningful oral communication. By doing so, speaking instruction can move beyond surface fluency training toward sustainable communicative competence grounded in deep learning principles

#### 4. Conclusion

This study concludes that memory, cognitive, and compensation strategies play interconnected and complementary roles in supporting English speaking performance within a deep learning-oriented instructional context. Rather than relying on a single strategy type, students strategically combined memory-based lexical retrieval, cognitive processing of ideas, and compensation-based self-regulation to manage the cognitive and communicative demands of speaking tasks. This strategic integration enabled learners to engage more confidently and coherently in oral communication.

The findings affirm Oxford's framework of direct language learning strategies, demonstrating that these strategies function as practical mechanisms through which learners regulate speaking performance in real time. When situated within deep learning pedagogy, strategy use supports meaningful engagement, reflective learning, and learner autonomy—core principles also emphasized in *Kurikulum Merdeka*. Speaking development, therefore, emerges not merely from repeated practice, but from learners' ability to strategically process, organize, and regulate language use.

Pedagogically, the study suggests that EFL speaking instruction should explicitly incorporate strategy-based learning that scaffolds memory, cognitive, and compensation strategies. By doing so, instructors can move beyond surface-level fluency training and foster sustainable communicative competence grounded in deep learning principles. Future research may extend this work by examining strategy development longitudinally or by integrating technology-supported environments to further explore strategic regulation in EFL speaking.

#### References

- Al-Faris, S., & Jasim, B. Y. (2021). Memory strategies and vocabulary learning strategies: Implications on teaching and learning vocabulary. *Journal of Humanities and Social Sciences Studies*, 3(10), 11–21. <https://doi.org/10.32996/jhsss.2021.3.10.2>
- Andayanie, L. M., Adhantoro, M. S., Purnomo, E., & Kurniaji, G. T. (2025). Implementation of Deep Learning in Education: Towards Mindful, Meaningful, and Joyful Learning Experiences. *Journal of Deep Learning*, 47–56. <https://doi.org/10.23917/jdl.v1i1.11157>
- Awang, S., Hassan, W., Abdullah, N., & Zawawi, M. Z. M. (2022). Use of fillers as a communication strategy in oral interactions. *International Journal of Academic Research in Business and Social Sciences*, 12(7), 1024–1037. <https://doi.org/10.6007/IJARBS/v12-i7/14330>

- Azzahra, I. F., & Rahmadhani, R. (2025). Kurikulum Merdeka: Telaah Potensi dan Tantangan Implementatif dalam Mewujudkan Pendidikan Fleksibel di Indonesia. *Jurnal Pendidikan Indonesia: Teori, Penelitian, Dan Inovasi*, 5(3). <https://doi.org/10.59818/jpi.v5i6.2288>
- Behroozian, R., Ghafoori, N., & Ahangari, S. (2025). An explicit communication strategies instruction: Iranian EFL learners' self-reported use of communication strategies. 250-219, (1)14, *جستارهای زبانی*.
- Biggs, J., Tang, C., & Kennedy, G. (2022). *Teaching for quality learning at university 5e*. McGraw-hill education (UK).
- Castleberry, A., & Nolen, A. (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds? *Currents in Pharmacy Teaching and Learning*, 10(6), 807–815. <https://doi.org/10.1016/j.cptl.2018.03.019>
- Chou, M.-H. (2024). Communication strategies, difficulties, and speaking tasks in foreign language learning. *Sage Open*, 14(3), 21582440241266324. <https://doi.org/10.1177/21582440241266324>
- Di Carlo, S. (2017). *Understanding cognitive language learning strategies*. <https://doi.org/10.7575/aiac.ijalel.v.6n.2p.114>
- Halim, A. (2024). A study on how the Merdeka curriculum promotes multilingualism in Indonesian ELT classrooms. *XLinguae*, 17 (2), 107–121. <https://doi.org/10.18355/XL.2024.17.02.07>
- Karbalaei, A., & Negin Taji, T. (2014). Compensation Strategies: Tracking Movement in EFL Learners' Speaking Skills. *Gist Education and Learning Research Journal*, 9, 88–102. <https://doi.org/10.26817/16925777.145>
- Kashefian-Naeeni, S., & Maarof, N. (2022). Iranian EFL and Malaysian ESL University Students' Use of Language Learning Strategies. *Vision: Journal for Language and Foreign Language Learning*, 11(1), 65–78. <https://doi.org/10.21580/vjv11i211836>
- Kelleher, J. D. (2019). *Deep learning*. MIT press. <https://doi.org/10.7551/mitpress/11171.001.0001>
- Khokhar, S., Pathan, H., Raheem, A., & Abbasi, A. M. (2020). Theory development in thematic analysis: Procedure and practice. *Review of Applied Management and Social Sciences*, 3(3), 423–433. <https://doi.org/10.47067/ramss.v3i3.79>
- Lambert, V. A., & Lambert, C. E. (2012). Qualitative descriptive research: An acceptable design. *Pacific Rim International Journal of Nursing Research*, 16(4), 255–256.
- Levelt, W. J. M. (1999). Models of word production. *Trends in Cognitive Sciences*, 3(6), 223–232. [https://doi.org/10.1016/S1364-6613\(99\)01319-4](https://doi.org/10.1016/S1364-6613(99)01319-4)
- Mathew, A., Amudha, P., & Sivakumari, S. (2020). Deep learning techniques: an overview. *International Conference on Advanced Machine Learning Technologies and Applications*, 599–608. [https://doi.org/10.1007/978-981-15-3383-9\\_54](https://doi.org/10.1007/978-981-15-3383-9_54)
- Mayer, R. E. (1996). Learning strategies for making sense out of expository text: The SOI model for guiding three cognitive processes in knowledge construction. *Educational Psychology Review*, 8(4), 357–371. <https://doi.org/10.1007/BF01463939>
- Nemati, A. (2009). Memory vocabulary learning strategies and long-term retention. *International Journal of Vocational and Technical Education*, 1(2), 14–24. <https://doi.org/10.4314/marang.v20i1.56821>
- Oxford, R. L. (2016). *Teaching and researching language learning strategies: Self-regulation in context*. Routledge. <https://doi.org/10.4324/9781315719146>

- Pawlak, M. (2018). Investigating the use of speaking strategies in the performance of two communicative tasks: The importance of communicative goal. *Studies in Second Language Learning and Teaching*, 8(2), 269–291. <https://doi.org/10.14746/sslit.2018.8.2.5>
- Plonsky, L., & Kim, Y. (2016). Task-based learner production: A substantive and methodological review. *Annual Review of Applied Linguistics*, 36, 73–97. <https://doi.org/10.1017/S0267190516000015>
- Rasheed, U., & Zafar, J. M. (2023). Effect of metacognitive strategies on secondary school students to achieve sustainable learning skills. *Academy of Education and Social Sciences Review*, 3(4), 521–529. <https://doi.org/10.48112/aessr.v3i4.601>
- Shakarami, A., Hajhashemi, K., & Caltabiano, N. (2017). Compensation still matters: language learning strategies in the third millennium ESL learners. Available at SSRN 3032963. <https://doi.org/10.2139/ssrn.3032963>
- Teng, F. (2020). The role of metacognitive knowledge and regulation in mediating university EFL learners' writing performance. *Innovation in Language Learning and Teaching*, 14(5), 436–450. <https://doi.org/10.1080/17501229.2019.1615493>
- Wilawan, S. (2012). Fostering main idea comprehension among EFL learners through cognitive and metacognitive strategies. *International Journal of Humanities and Social Science*, 2(14), 46–54.
- Zhang, J. (2023). Exploring undergraduate translation students' perceptions towards machine translation: A qualitative questionnaire survey. *Proceedings of Machine Translation Summit XIX, Vol. 2: Users Track*, 1–10.
- Zhang, W., & Wilson, A. (2023). From self-regulated learning to computer-delivered integrated speaking testing: Does monitoring always monitor? *Frontiers in Psychology*, 14, 1028754. <https://doi.org/10.3389/fpsyg.2023.1028754>
- Zhang, W., Zhang, D., & Zhang, L. J. (2021). Metacognitive instruction for sustainable learning: Learners' perceptions of task difficulty and use of metacognitive strategies in completing integrated speaking tasks. *Sustainability*, 13(11), 6275. <https://doi.org/10.3390/su13116275>
- Zhang, W., Zhao, M., & Zhu, Y. (2022). Understanding individual differences in metacognitive strategy use, task demand, and performance in integrated L2 speaking assessment tasks. *Frontiers in Psychology*, 13, 876208. <https://doi.org/10.3389/fpsyg.2022.876208>