

## USING METACOGNITIVE STRATEGIES IN SECOND LANGUAGE LEARNING: A BIBLIOMETRIC ANALYSIS

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DOI: <http://dx.doi.org/10.29300/ling.v10i2.4602>

Received: June 26<sup>th</sup> 2024

Accepted: August 2<sup>nd</sup> 2024

Published: October 20<sup>th</sup> 2024

### Abstract

Metacognitive strategies can help students learn autonomously, so they have been studied in second language learning. However, mapping research trends and future challenges on this issue is rare. This study aims to conduct a bibliometric study using metacognitive strategies in second language learning. Scopus papers from the past decade provide data. Descriptive statistics and Vosviewer were used to analyse data. The results showed six research clusters: (1) the use of metacognitive strategies in achieving learning outcomes, (2) students' motivation and awareness in a second language, (3) teaching writing, (4) learning interventions and their effects on students' comprehension and abilities, (5) learning activities, problems, and reflections in learning a second language, and (6) courses related to learning a second language. Cluster 6 has the weakest relationship with other clusters in their study. Year-to-year research themes developed. Research focuses on managing course programs in the early five years by utilising metacognitive strategies, technology, motivation, and student awareness. From mid-2018 to 2019, research trends have developed in learning to write. After that, there are no new research trends to date. Trends address second language learning outcomes, student motivation and self-awareness, learning interventions, and their effects. Student issues research themes are rarer.

**Keywords:** grammar learning strategies, language learning strategy, metacognitive strategies, second language learning

### INTRODUCTION

Second language learning has been a research trend over the last two decades (Plonsky, 2013; Zhang, 2019) because of its interesting research topics (Larson–Hall, 2017). Therefore, much research discusses the role of strategy in the success of second language learning. There are four language learning strategies: cognitive, metacognitive, affective, and social (Pawlak, 2013, 2018). Each student uses the language learning strategy to achieve the targeted learning objectives and competencies.

However, a strategy that plays an essential role in supporting students' independence in language learning is a metacognitive strategy. Among all learning strategies, metacognitive strategy is a high-level executive skill that requires planning, monitoring, and evaluation (Goctu, 2017). This strategy encourages students to plan, implement, monitor, evaluate, and follow up on learning activities. Thus, students know and regard second language learning as a need to be fulfilled and mastered. Furthermore, with metacognitive strategies, students can

improve their reading (Teng, 2020), writing (Goctu, 2017), and speaking skills (Ouyang et al., 2019).

However, applying a metacognitive strategy still needs to be honed. This is because the metacognitive strategy requires learners to be highly aware and disciplined and continuously realise the learning process's capacity, shortcomings, and effectiveness. Learners with high metacognitive strategies can develop their knowledge and skills in language independently.

However, learners still experience difficulties in utilising metacognitive strategies that can affect their writing performance (Dollah et al., 2023). Difficulties in implementing metacognitive strategies in language learning occur due to several factors, such as student interests, background knowledge, and teacher influence (Haryono, 2023), limited awareness of mental processes, and lack of coping strategies (Looi-Chin et al., 2017), as well as a lack of knowledge and control over the learning process (Zhao, 2013)

Previous studies have discussed research trends with bibliometrics in a second language (Al-Hoorie & Vitta, 2019), applied linguistics (De Bot, 2015; Lei & Liu, 2018), and second language acquisition (Zhang, 2019). The findings suggest that applied linguistics research is more multidisciplinary because of the increasing influence of cross-disciplinary theories (e.g., complexity theory and sociocultural theory) and methodologies (e.g., corpus linguistics, sociolinguistics, neurolinguistics) (De Bot, 2015), as well as on research trends in second language acquisition and learning (Lei & Liu, 2018; Zhang, 2019).

Second language learning has many dimensions that can determine its optimal implementation. One crucial factor is metacognitive strategy because metacognition is one of the key ideas in contemporary research in second language teaching (L2) and education in general (Wu, 2022). Therefore, bibliometric research is needed to map the development of metacognitive strategy research. Previous research discussed research trends focused on language learning strategies with a systematic review (Kölemen, 2021) and bibliometric analysis (Chen, 2023; Hajar & Karakus, 2024; Romero et al., 2023). Several studies have examined second language learning strategies with meta-analysis (Ardasheva et al., 2017) and bibliometric analysis (Sossa et al., 2023). One study identified the research topic of metacognitive strategies in facilitating self-regulated learning using the systematic review method (Agustin, 2019). Previous studies have found that language-learning strategies have an essential role in the language-learning process (Chen, 2023). However, language learning strategies are complex and dynamic because they are related to the cognitive and affective

factors of learners (Milla & Gutierrez-Mangado, 2019). Therefore, further research needs to pay attention to the use of specific language-learning strategies (Chen, 2023).

However, not many bibliometric studies identify the development of language teaching research (Syahid & Qodir, 2021). In addition, limited research maps the development of metacognitive strategies in second language learning. Therefore, the development of temporal research has not been explored (Zhang, 2019). Mapping metacognitive strategy research trends is needed to get an overview of topics in great demand, research gaps, development of research topics from year to year, and research potential in succession.

Thus, this study aims to conduct a bibliometric analysis of the role of metacognitive strategies in second language teaching to map research trends by processing and comparing published data to detect systematic patterns and developments each year. Therefore, this research is essential to identify the development of research clusters, research trends in a decade, and research gaps in metacognitive strategies in second language learning. By analysing research trends, we get an overview of topics, knowledge gaps, new ideas, and opportunities for future research (Donthu et al., 2021; Plonsky, 2014). Thus, scientific progress can be assessed to gain a more comprehensive understanding of the chosen topic and support the introduction of variables used during research on teaching and learning (Shoaib et al., 2021), as well as to build a solid foundation to empower scholars to position their intended contributions to the field (Donthu et al., 2021).

The results of this study contribute to the depiction of trends in metacognitive strategy research in the last decade. Thus, it can be seen what research topics are popular and which have not been widely carried out so that they can be the basis for further research. In addition, the results of this study can be used as a basis for determining policies in the implementation of second language learning, especially in the use of metacognitive strategies.

## **METHOD**

### **Research Design**

This study employed bibliometric analysis that uses quantitative (Lei & Liu, 2018; Zhang, 2019) and qualitative (Cobo et al., 2011; Donthu et al., 2021). The bibliometric analysis measures the quantity and quality of publications and the impact of research (Agarwal et al., 2016; Donthu et al., 2021). In particular, this research trend seeks to map research trends in metacognitive strategies in second language learning.

## Research Sample

The article search technique was implemented comprehensively to obtain relevant bibliographic data on Scopus. Based on the relevant theory, this research uses the search keyword ‘Metacognitive Strategies in Second Language Learning’. The publication period in this study was determined between 2013 and 2022. Table 1 shows the search strings used in the Scopus database to obtain relevant sources.

Table 1. Search string

Search Strings
<i>TITLE-ABS KEY( metacognitive AND strategies AND in AND second AND language AND learning ) AND ( LIMIT-TO ( PUBYEAR , 2022 ) OR LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) OR LIMIT-TO ( PUBYEAR , 2017 ) OR LIMIT-TO ( PUBYEAR , 2016 ) OR LIMIT-TO ( PUBYEAR , 2015 ) OR LIMIT-TO ( PUBYEAR , 2014 ) OR LIMIT-TO ( PUBYEAR , 2013 ) AND ( LIMIT-TO ( DOCTYPE , “ar” ) OR LIMIT-TO ( DOCTYPE , “cp” ) OR LIMIT-TO ( DOCTYPE , “re” ) ) AND ( LIMIT-TO ( SUBJAREA , “SOC” ) OR LIMIT-TO ( SUBJAREA , “ARTS” ) ) AND ( LIMIT-TO ( EXACTKEYWORD , “Metacognitive strategies in second language learning” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) ) AND ( LIMIT-TO ( SRCTYPE , “j” ) OR LIMIT-TO ( SRCTYPE , “p” ) )</i>

## Instrument and Procedures

Based on the search string, the publication selection process is explained.

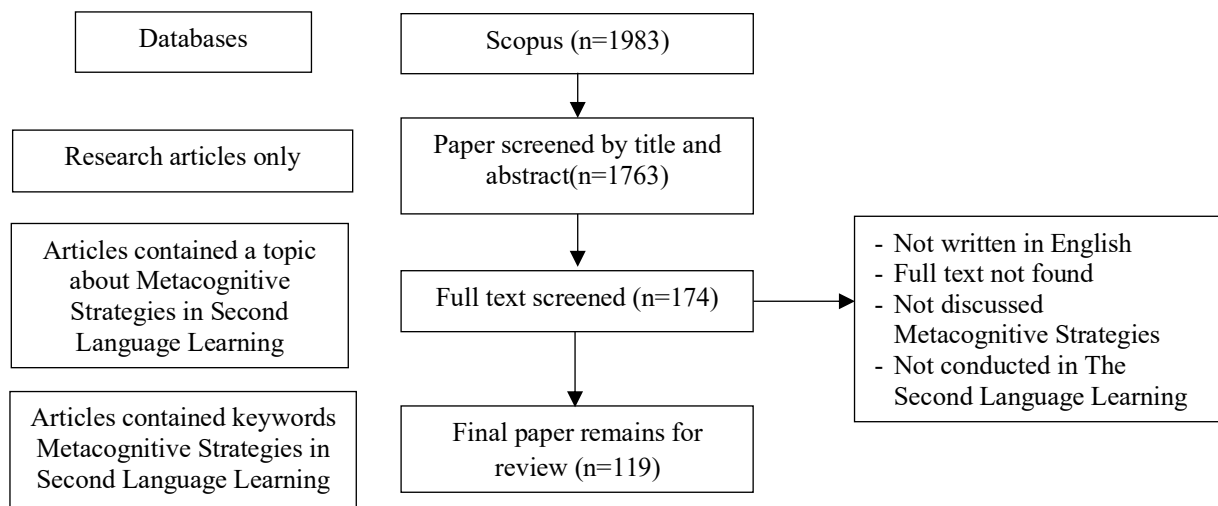


Figure 1. Process of publication selection

The figure shows that the published article data search procedure follows several steps. First, the Scopus database was found in 1983. After filtering on research articles only, 1763 publication data remained. Furthermore, the publication data is limited to several criteria, namely English, full text available, containing research topics of metacognitive strategies in

second language learning. Based on these criteria, the remaining 174 articles were selected. In the end, articles with the keywords of metacognitive strategy in second language learning were selected, so the articles chosen were 119. These articles were analysed in the next stage.

### **Data Analysis**

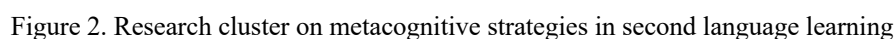
This study used three indicators for data analysis, namely (1) quantity indicators, which measure research productivity; (2) quality indicators that measure research performance; and (3) structural indicators that measure the relationship between publications and areas of research (Agarwal et al., 2016; Al-Hoorie & Vitta, 2019; Arnott et al., 2019; Cobo et al., 2011; Drysdale et al., 2013; Durieux & Gevenois, 2010). This research utilised descriptive statistics to analyse quantitative data and the Vosviewer application to analyse qualitative data.

Furthermore, data analysis was carried out in several steps. First, data were identified based on the title and research abstract. Second, data were determined based on co-occurrences of research topics. Third, research clusters were identified based on network visualisation. Fourth, research trends were analysed based on overlay visualisation in the last decade. Fifth, research gaps were analysed based on the number of publications per year, research item density, and cluster density visualisation.

## **FINDINGS**

### **Research Cluster on Metacognitive Strategies in Second Language Learning**

The study's results found six clusters of metacognitive strategies in second language learning. Research clusters show groups of related research topics. The findings of the research cluster on metacognitive strategy in second language learning are presented in Figure 2 below.



These clusters are interrelated; for example, motivation in Cluster 2 relates to awareness in Cluster 2 and comprehension in Cluster 4. Motivation research is closely related to students' attention to learning and comprehension improvement. However, Cluster 6 has the most diminutive relationship with other clusters because there are only two topic items in Cluster 6: course and transfer. The finding suggests that these research clusters are investigated for their relevance and influence on other topics to develop research on metacognitive strategies in second language learning. Nevertheless, various issues in the research cluster still need to emerge and further develop.

## Research Trends in A Decade on Metacognitive Strategies in Second Language Learning

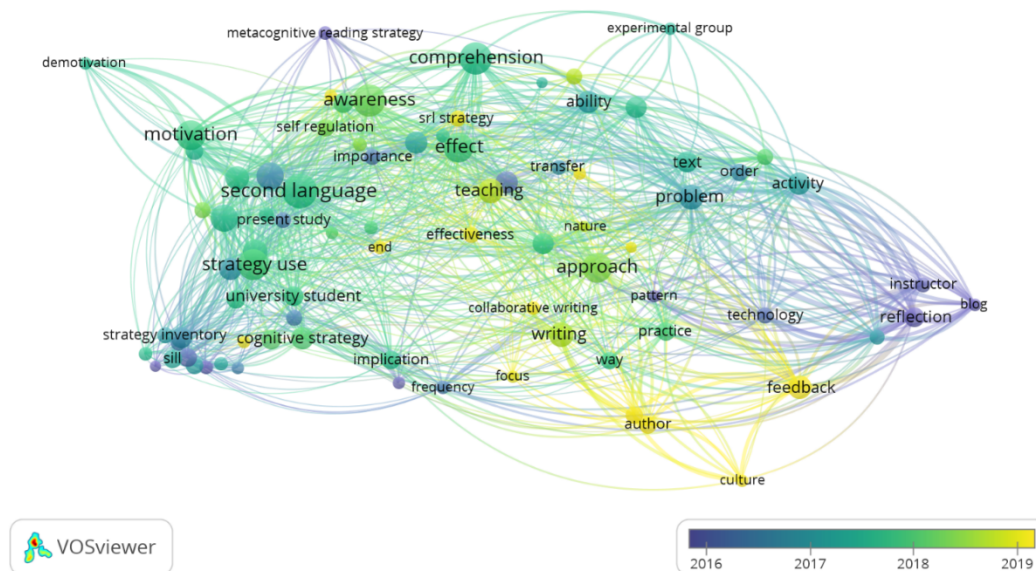


Figure 3. Research trends on metacognitive strategies in second language learning

Figure 3 shows the research topic on metacognitive strategies in second language learning, which are dynamic from year to year. From 2013 to 2017, research trends tended to focus on subject programs related to the use of technology, problems, supporting factors, reflection, and learning outcomes. After that, until mid-2018, the research focused on using strategies related to motivation, personal awareness, and approaches and their effects on second language learning. From mid-2018 to 2019, the study focuses on writing instructions and their objectives, feedback, and effectiveness. After that, there are not many different research trends to date. The study's findings illustrate that research trends in metacognitive strategies in second language learning occur based on changes and developments in research topics from year to year or more. 2013-2016 has a trend of research topics long enough to develop into new issues. After that, 2017, 2018, and 2019 have a relatively dynamic trend of research topics.

## Research Gaps on Metacognitive Strategies in Second Language Learning

Quantitatively, the published data are presented in Table 2 as follows.

Table 2. Number of annual publications in metacognitive strategies in second language learning

Period	Total Publication	Total Citation
2013	9	83
2014	13	86
2015	5	28
2016	11	165
2017	11	49
2018	14	170
2019	17	63
2020	15	93
2021	13	24
2022	12	7
Total	119	768

Table 2 shows that the number of publications on metacognitive strategies in second language learning has changed from year to year. However, the difference in number is insignificant, except in 2015, which decreased from the previous year and then increased in 2016. In addition, research gaps are also reviewed based on research topic density and cluster density in Figures 4 and 5 below.

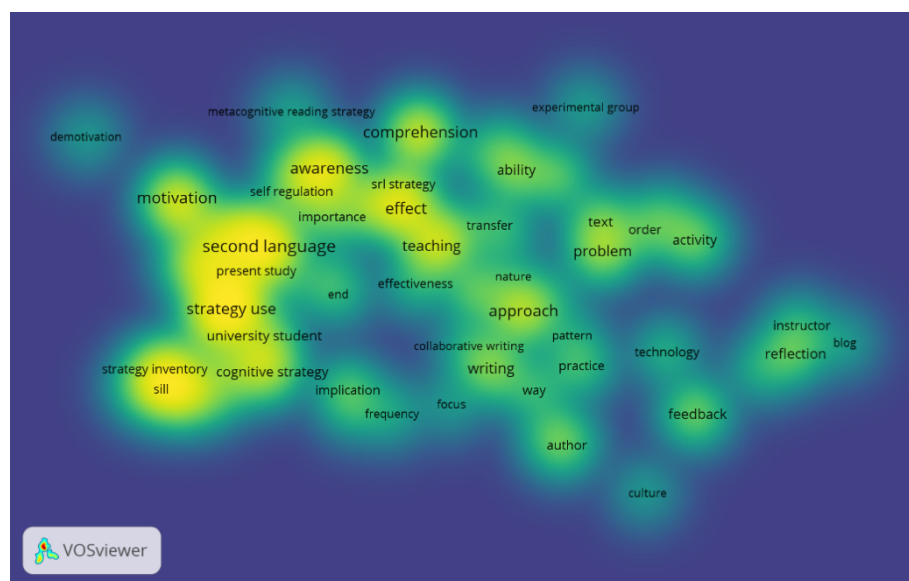
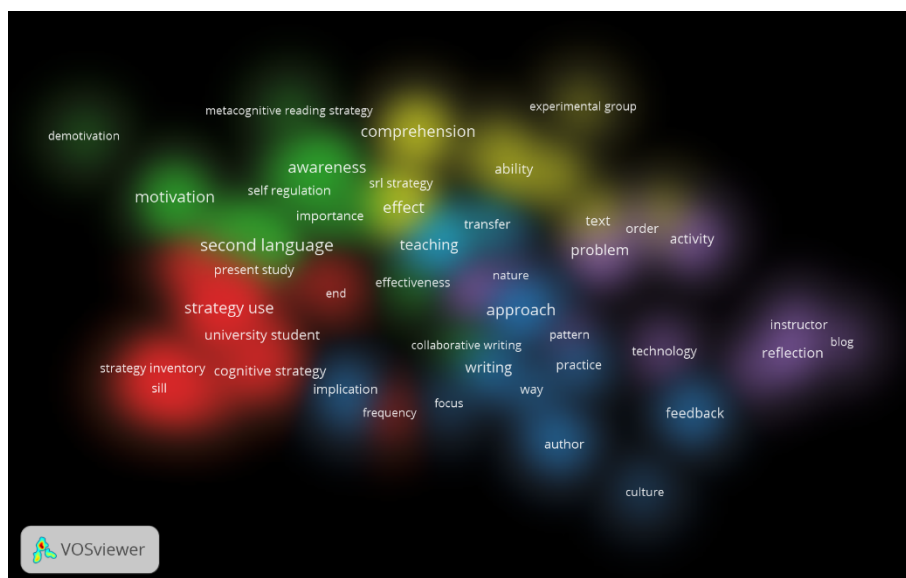


Figure 4. Research topic density on metacognitive strategies in second language learning





Figures 4 and 5 show that the most discussed research topics are clusters 1 (red), 2 (green), and 4 (yellow). So, the trending topic tends to be about using strategies, especially metacognitive strategies, in second language learning by using motivation and student awareness that are oriented to students' comprehension and abilities. However, research gaps can be identified based on the topics that have not been widely discussed: demotivation, cultural involvement, and the use of technology in second language learning. These topics are very much needed today in second language learning because learner demotivation can affect learning outcomes, culture needs to be integrated with second language learning, and technological developments contribute to the second language learning process. In addition, practical phenomena and the development of cutting-edge theories can also be a research gap and an opportunity to develop metacognitive strategy research in second language learning. Thus, these research gaps can be a potential topic that needs to be studied by further research.

## DISCUSSION

## Research Cluster on Metacognitive Strategies in Second Language Learning

The results show that metacognitive strategies have been studied in various ways to identify how they play a role in second language learning. Based on the research clusters found, metacognitive strategy research has been studied multi-dimensionally. It is based on several shreds of evidence, namely (1) research is not only studied from the point of view of teachers but also students; (2) research is examined on several language skills; and (3) research is studied in a specific target language. The multidimensionality of research on metacognitive

strategies in second language learning shows the existence of these strategies, which are considered in the effort to carry out optimal second language learning.

There are six research clusters, namely (1) the use of metacognitive strategies in achieving student learning outcomes, (2) students' motivation and awareness in a second language, (3) teaching writing, (4) learning interventions and their effects on students' comprehension and abilities, (5) learning activities, problems, and reflections in learning a second language, and (6) courses/courses related to learning a second language. The research cluster shows that metacognitive strategies in second language learning were investigated from the educational and psychological point of view by focusing on motivation (Soruç & Tekin, 2018) and student awareness (Roy & Crabbe, 2014). Second language learning is also seen as a social activity that can be done collaboratively, such as in collaborative writing activities (Chen & Ren, 2022). This finding aligns with previous studies' results that research trends in second language learning tend to show a cross-disciplinary role (De Bot, 2015; Lei & Liu, 2018). It is due to the characteristics of second language learning that cannot be separated from the various factors surrounding its implementation because students and teachers have diverse social, cultural, and psychological backgrounds. It is evident from previous research that social and cognitive (psychological) approaches are very influential in second language learning research (Lei & Liu, 2018) in studying various aspects comprehensively. For example, collaboration can be done by providing corrective feedback by teachers and other students in the form of input on writing or other language products produced by students (Prihatini & Pangesti, 2023).

Based on these clusters, previous research has investigated metacognitive strategies from the teacher's point of view (Vellanki et al., 2022) and students (Otto & Lopez-Medina, 2021; Seeger & Lenhard, 2022; Shehadeh & Dwaik, 2022; Sun et al., 2021; Widharyanto & Binawan, 2020; Zhao & Liao, 2021). The findings show that research tends to focus on examining metacognitive strategies from the student's point of view. The finding aligns with earlier review research, which also found that research primarily focused on individual learner differences in language learning strategies (Kölemen, 2021). The findings indicate that student characteristics in using metacognitive strategies are essential in second language learning. Metacognitive strategies are a diversity of student characteristics that can affect the process and success of second language learning (Prihatini & Sugiarti, 2022).

The results showed that metacognitive strategies were the most widely used by students as a language-learning strategy (Shehadeh & Dwaik, 2022; Widharyanto & Binawan, 2020). Furthermore, knowledge of metacognitive strategies at the beginning of the first semester not

only shows a strong correlation with second language competence at the same time but also predicts language competence one year later, as well as academic success in the first three semesters (Seeger & Lenhard, 2022). Prior research found that the metacognitive strategy empowers learners to become more aware of their cognitive processes, regulate their learning behaviors, and achieve better language learning outcomes (Agustin, 2019). It can be concluded that metacognitive strategy research is vital in achieving student competence in second language learning. The strategy also positively contributes to teachers' work.

For teachers, using metacognitive strategies can contribute positively to implementing scaffolding (Vellanki et al., 2022). Moreover, previous research also found that teachers have an essential role in second language learning, so the topic of the role of teachers in second language learning also tends to be widely researched (Prihatini, 2023). However, research that focuses on the teacher's point of view is still minimal, so it has not captured much of the experiences and responses of teachers in utilising metacognitive strategies in second language learning. Therefore, further research is needed that focuses on how teachers facilitate students' metacognitive strategies to support the process and success of second language learning.

Based on the language skills taught, metacognitive strategies are the most widely used in learning to write (Alfaifi, 2022; Sun et al., 2021; Teng, 2021; Zhao & Liao, 2021). It is evident from a research cluster, Cluster 3, which discusses explicitly metacognitive strategies for learning to write. The high research interest in writing is possible because writing requires linguistic knowledge and skills in grammar because of students' challenges in learning writing skills (Prihatini et al., 2023; Prihatini & Pangesti, 2023). However, further research needs to examine the gaps and needs in writing learning that can overcome these obstacles more optimally by using metacognitive strategies.

In learning to write, metacognitive strategies are investigated from various aspects: the learning approach, implementation practices, feedback on learning activities, and technology in writing. The results showed that metacognitive strategies were used in a series of writing processes, from interpreting writing assignments, planning, translation, evaluation & monitoring, and writing revisions (Zhao & Liao, 2021). Furthermore, integrating students' metacognitive experiences correlates with students' writing test assessments significantly (Sun et al., 2021). Moreover, previous research has shown that writing is a complex language process that requires adequate grammar knowledge (Prihatini et al., 2023). Language learning strategies are personal, as each learner has unique habits and approaches to managing and applying their skills to master language skills effectively and efficiently (Pangesti et al., 2023).

Thus, students can effectively organize their ideas and apply proper grammar in their writing by using the appropriate strategies (Prihatini & Pangesti, 2023). So, it can be concluded that metacognitive strategies can be utilised at all stages of writing and can contribute positively to the quality of students' writing.

In addition to learning to write, metacognitive strategies are also used in learning to read (Ferrari et al., 2022; Teng, 2020), listen (Liu, 2020; Milliner & Dimoski, 2021; Read et al., 2021), and speak (Karunanithi et al., 2020; Yan, 2020). The results of the study show that metacognitive strategies are beneficial for increasing competence and confidence in listening activities (Milliner & Dimoski, 2021) and reading (Teng, 2020) and helpful in increasing student participation and productivity in speaking (Karunanithi et al., 2020). Based on research findings, metacognitive strategies are language learning strategies that can be applied to all language skills because they positively contribute to the process and student learning outcomes in second language learning.

However, research focuses on writing, reading, and speaking skills among four language skills. The previous study also found an imbalance of research interest in language skills because research focuses on reading, speaking, and writing skills (Zhang, 2019). However, all language skills are essential for students to master a second language. Therefore, further research needs to be directed at utilising all language skills, both receptively and productively, because they both support competence and performance in language.

Based on the target language, metacognitive strategies are generally used in second-language learning (Ferrari et al., 2022; Karunanithi et al., 2020; Teng, 2020; Zhao & Liao, 2021) and also foreign language learning (Milliner & Dimoski, 2021; Seeger & Lenhard, 2022; Sun et al., 2021). In this case, it should be emphasised that learning a second language is defined as a language other than the first language. That is, foreign language learning is also included in second language learning. The results show that metacognitive strategies can contribute positively to second language learning (Teng, 2020; Zhao & Liao, 2021) and foreign language learning (Milliner & Dimoski, 2021; Seeger & Lenhard, 2022; Sun et al., 2021). However, second language learning needs to utilise metacognitive strategies in more varied and contextual learning in various oral and written communication practices. As suggested in previous research which indicated that in language learning, it is necessary to look at the application of metacognitive strategies in specific and varied contexts (Karunanithi et al., 2020) because students in particular contexts need unique guidance in using strategies for learning that they are not good at (Shehadeh & Dwaik, 2022).

### **Research Trends in A Decade on Metacognitive Strategies in Second Language Learning**

The results show that recent research trends show changes and dynamics in the last decade. From 2013 to 2017, the trend led to research on managing courses/subjects using metacognitive strategies. In addition, there is a tendency to use technology, motivation, and students' awareness in learning a second language. These findings align with previous research on motivation involvement in second language learning (Lei & Liu, 2018). Another significant trend is the increasing interest in technology as technology advances that can potentially implement second language learning (Zhang, 2019). Unfortunately, the phenomenon of metacognitive strategies in second language learning that utilises motivation and technology has not created a new research topic to explain how it plays a role in this pandemic and new normal era.

From mid-2018 to 2019, research trends developed in the management of learning to write. This finding is related to previous research that the communicative/interaction cluster had shrunk from 2008 to 2018. Still, this cluster continues to be one of the most important research themes in the field (Zhang, 2019). Learning to write as a form of textual communication is essential for researchers, especially using metacognitive strategies. The intensity of research on learning to write raises new trends, such as collaborative writing. It shows that learning is interpreted as a cognitive product and allows for a social collaboration space to produce a text. However, collaborative writing has not been widely discussed in various texts. The pandemic conditions and the new normal era have not yet created a new research cluster that can demonstrate online and blended writing collaboration.

There have been no new research trends since early 2019. However, the need for second language learning becomes dynamic as time passes. Moreover, the COVID-19 pandemic at the end of 2019 made learning online and digital. However, it did not impact the emergence of topics or even significant research clusters on metacognitive strategies in second language learning. Therefore, it is necessary to investigate metacognitive strategies in second language learning using digital technology or blended learning. Previous research also suggests exploring how technologies combined with language learning strategy can improve and make language learning more enjoyable (Zhang et al., 2019). In addition, research is also needed that highlights the metacognitive strategies of post-pandemic learners for second language learning because they are experiencing a transition in learning modes before, during, and after the

pandemic. This phenomenon can bring about cognitive and social effects on metacognitive strategies used to support language learning success.

### **Research Gaps on Metacognitive Strategies in Second Language Learning**

Based on the findings, more research has focused on comprehension than ability. The learning achievement that students must obtain is a cognitive understanding and an adequate ability to apply this knowledge. These trends indicate the importance of further research investigating second language learning based on performance, psychomotor competence, and affective. Students are said to be able to master a second language if they have knowledge of the linguistic system and have language skills both receptively and productively. The findings are related to the results of previous research that students use their language learning strategies according to their language level and the skills they try to master (Sossa et al., 2023).

In addition, research topics on student problems tend to be fewer. Research problems in second language learning are complex enough to be studied in research. However, not many studies have focused on identifying second language learning problems, such as demotivation (Isatayeva et al., 2018; Kim et al., 2017). However, research on second language problems reviewed from metacognitive strategies is vital because language learning strategies involve both intentional and unintentional actions to improve language skills, shaped by factors like motivation, perception, emotions, and multilingual background (Chen, 2023; Romero et al., 2023).

Topics that get less attention in research on metacognitive strategies in second language learning is the role of cultural aspects on the issue. Culture is one of the student backgrounds that teachers need to pay attention to when learning a second language. The similarities and differences between students' cultures and the language being studied also determine the characteristics and metacognitive strategies used. Thus, further research needs to examine the topic comprehensively to get an overview of the role of culture in second language learning by applying a metacognitive strategy. These findings support previous research that also advocates the importance of cultural studies with empirical language learning strategies (Hajar & Karakus, 2024)

### **CONCLUSION**

Based on this description, it can be concluded that there are six research clusters of metacognitive strategies in second language learning. Five of these clusters have a reasonably

close relationship, but cluster 6 has fewer relationships with other clusters. In general, research trends focus on using strategies, especially metacognitive strategies, in second language learning to achieve student learning outcomes by utilising internal factors within students and external factors in aspects of learning designed by teachers. However, research topics on students' problems in second language learning have not been widely carried out. From year to year, research topics have developed and changed. However, since 2019, there has been no new research trend on this metacognitive strategy in second language learning. Although this research provided valuable insights into metacognitive strategy in second language learning, it still has limitations. First, the scope of research is relatively narrow because it focuses on metacognitive strategies only, while cognitive, affective, and social strategies are not discussed. Thus, further research is recommended to map the research trends of language learning strategies based on these four strategies to get an overview of their use and comparison between the four strategies.

### **Acknowledgements**

The researcher expresses gratitude to the Universitas Muhammadiyah Malang and Universitas Bina Nusantara, Indonesia, for supporting this study.

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