LLT Journal, e-ISSN 2579-9533, p-ISSN 1410-7201, Vol. 27, No. 1, April 2024, pp. 252-272

LLT Journal: A Journal on Language and Language Teaching
http://e-journal.usd.ac.id/index.php/LLT
Sanata Dharma University, Yogyakarta, Indonesia

METACOGNITIVE STRATEGIES IN MEDIATING EFL ADULT LEARNERS' SELF-REGULATED LANGUAGE LEARNING: A SYSTEMATIC REVIEW

Renol Aprico Siregar[1*], Nenden Sri Lengkanawati[2], and Ika Lestari Damayanti [3]
[1,2,3]Universitas Pendidikan Indonesia, Indonesia
renolaprico@upi.edu[1], nendensl@upi.edu[2], and ikalestaridamayanti@upi.edu[3]
*correspondence: renolaprico@upi.edu
https://doi.org/10.24071/llt.v27i1.5502
received 8 December 2022; accepted 10 April 2024

Abstract
Although many studies focus on enhancing resource assistance and the advancement of adult learners' knowledge and abilities, there is a paucity of studies on the theoretical views that define strategies for assisting adults in learning independently. To fill this gap, this study draws on previous research to elaborate on why metacognitive strategies are suitable for adults' self-regulated learning (SRL), and how metacognitive strategies promote SRL. As this study employed a systematic review, a rigorous search scheme was implemented across multiple databases, resulting in the selection of relevant studies based on predetermined inclusion and exclusion criteria. The selected articles were assessed for quality, and data extraction was performed to identify key characteristics of the studies. The synthesis of the existing literature underscores the suitability of metacognitive strategies in EFL adult learners' self-regulated learning. The findings reveal that incorporating metacognitive strategies helps cultivate SRL in EFL adult learners, owing to their cognitive maturity, pre-existing knowledge, and life experiences. In addition, the metacognitive strategy helps EFL adult learners enhance their awareness of cognitive processes, regulate learning behaviours, and optimize language learning outcomes. Regarding the role, metacognitive strategy is one of the key components of SRL. Some practical recommendations are made to support teachers in facilitating adults' self-regulated language learning.

Keywords: adult learners, metacognition, metacognitive strategies, self-regulated learning, systematic literature review

Introduction
Developing self-regulation skills is crucial for adult learners (Kellenberg et al., 2017). Since they are independent, acknowledging and incorporating their past experiences into the learning process can enhance their achievements (Chen, 2014). Contrary to being blank canvasses (Nelken, 2009), their life experiences serve as the medium through which they grasp contents and redefine new objectives of learning (Merriam, 2001). Furthermore, they possess an inherent inclination toward acquiring knowledge through playing an active role in planning and implementing

This work is licensed under CC BY-SA.
Creative Commons Attribution-ShareAlike 4.0 International License

their learning endeavours, characterized by prioritizing learning experiences centred around applicability and problem-solving (Knowles, 1980; Knowles et al., 2005). Consequently, it is critical to strongly endorse the enhancement of strategies for self-regulated learning (SRL, henceforth) in order to assist adult learners in consciously planning their language learning (Schleicher, 2019).

Within the gamut of adult education, SRL plays a pivotal role in facilitating optimal learning outcomes. It enables learners to proactively regulate their learning processes, establish goals, evaluate their progress, and adapt their strategies to accomplish optimal educational outcomes (Tauber & Ariel, 2023). This aligns with the capacity of learners to manage their cognitive, metacognitive, and motivational processes to optimize their learning outcomes (Zaky, 2021). In other words, adult learners who are equipped with self-regulation skills can successfully navigate their academic paths by drawing on their prior experience and independence to attain significant learning outcomes (Kellenberg et al., 2017).

Considering the crucial importance of SRL in adult learning, this study focuses on the interconnection between SRL and metacognitive strategies. As previously explicated, metacognitive strategies not only accelerate the learning process and improve adults' foreign language learning performance (Stebner et al., 2022), but they also function as essential higher-order abilities that form the foundation of successful self-regulation. More specifically, they assist learners in monitoring, setting up, analysing, and governing their learning process, rendering them domain-general and relevant across diverse activities and subjects (Leopold & Leutner, 2015).

Expanding upon the previously emphasised significance of SRL, the contribution of metacognitive strategies to the improvement of SRL becomes obvious. Studies have demonstrated that metacognitive strategies play a crucial role in learners' ability to effectively regulate their learning within the field of SRL (Efklides & Metallidou, 2020). By assisting individuals in planning, organizing, monitoring, reflecting, and evaluating their learning process, metacognitive strategies facilitate the framework required for effective self-regulation (Heaysman & Kramarski, 2022). Through this, learners not only enhance their awareness of their mental abilities and learning tasks, but also acquire expertise in recognising difficulties, choosing suitable approaches, and making well-informed choices to overcome barriers (Azevedo & Aleven, 2013; Harputlu & Ceylan, 2014). Therefore, incorporating metacognitive strategies into self-regulated learning practices enhances the foreign language learners' capacity to effectively manage and improve their learning experiences.

In the realm of EFL classrooms, there has been a significant interest in exploring the significance of metacognitive strategies on adult learners' self-regulated learning experiences. Extensive scholarly inquiry has been devoted to metacognitive strategies in the domain of language acquisition, specifically concerning the topics, such as vocabulary (Cabrera-Solano, 2019), writing (Pitenoee et al., 2017; Teng, 2022; Teng, 2021), reading (Amini et al., 2020; Marboot et al., 2020; Wallace et al., 2021), listening (Maftoon & Alamdari, 2020; Chou, 2017), and the use of technology in language learning (Shih & Huang, 2020; Yilmaz & Baydas, 2017). Most of these studies provide empirical-based explanations into the role of metacognitive strategies in English as a Foreign Language (EFL) learning through the lens of language skills which are only

essential for effective communication. Nonetheless, they do not specifically prioritise self-regulated learning as a comprehensive approach to grasping language learning.

Despite the growing interest in the use of metacognitive strategies in EFL, a thorough synthesis of the literature is still required to provide an in-depth comprehension of their impact on EFL adult learners' SRL. Adult learners frequently face challenges in acquiring language skills in the EFL context for a variety of reasons, including inadequate exposure to the language and linguistic background differences, which contribute to the unique constraints they encounter (Zaky, 2021). By equipping learners with the ability to direct their learning processes, metacognitive strategies have the potential to resolve these obstacles. It, therefore, is crucial to address these concerns in a timely manner, given the urgent obstacles that adult learners face when attempting to acquire English.

This present study aims to address why metacognitive strategies are suitable for self-regulated language learning to establish the theoretical underpinnings and justification for their incorporation into EFL adult education programmes. This inquiry explores the fundamental concepts and cognitive mechanisms that underlie metacognition, offering perspectives on its significance and practicality in the EFL setting. In addition, the present study explores how metacognitive strategies support the SRL. Through this scholarly inquiry, language educators can discern efficacious instructional methodologies and interventions that enhance the educational experiences of EFL adult learners. Such an examination contributes to making a valuable addition to the current scholarly literature, allowing professionals in the field of education and instructional design to devise specific measures to improve the metacognitive abilities of adult learners and facilitate more efficient self-regulated learning. Ultimately, the present study holds significance throughout the field as a systematic examination of the results derived from prior research in the literature can serve as a foundation for subsequent investigations and offer researchers insight.

In pursuit of the objectives, the authors seek answers to the subsequent inquiries:

1. Why are metacognitive strategies suitable for EFL adults' self-regulated language learning?
2. How do Metacognitive strategies support EFL adults' self-regulated language learning?

Literature Review

Metacognition

Metacognition is a term commonly used in the field of educational psychology to describe learners' awareness and understanding of their cognitive processes (Flavell, 1981, 1979). Specifically, it refers to the knowledge that learners possess about the cognitive activities involved in the decision-making process before, during, and after the completion of a learning task. Flavell's (1979) model of metacognition has been extensively utilized as a theoretical framework in the field of English language teaching to investigate the process of learning and teaching due to its meticulous approach to recognising the cognitive processes involved in learning and teaching (Zhang & Zhang, 2019). Moreover, the model

provides practical benefits for instructional design, enabling learners to develop the ability to learn independently and efficiently in the target language (Zhang, 2010).

Flavell (1979) asserts that metacognition consists of three broad components, namely metacognitive knowledge, metacognitive regulation, and metacognitive experiences. Firstly, metacognitive knowledge consists of the comprehension of the learner's mental processes, which can influence cognitive outcomes. This research domain exhibits significant productivity, not solely within the realm of educational psychology, but also in the sphere of second language acquisition and foreign language learning (Zhang, 2010; Zhang & Zhang, 2013). Flavell (1979) delineates three constituent elements of metacognitive knowledge, namely knowledge of self, knowledge of task, and knowledge of strategies. Person knowledge pertains to learners' comprehensive comprehension of facets associated with their overarching cognizance encompassing aspects of their learner identity, encompassing facets such as personality attributes, capabilities, capacities, motivational inclinations, aptitude, and cognitive operational capacity. Task knowledge refers to a person's understanding of the inherent characteristics, complexity, and nature of a given task, as well as the cognitive processes required for its successful completion. Strategy knowledge refers to the cognitive and metacognitive understanding of a variety of learning-related problem-solving techniques. Later, Schraw (1998) hones the taxonomy of metacognitive knowledge by integrating three distinct classifications, namely (1) declarative knowledge, indicating familiarity with pertinent concepts and methods applicable to a particular task, (2) procedural knowledge, signifying recognition of the framework through which principles and ideas are operationalized to address challenges, and (3) conditional knowledge, encompassing an apprehension of the circumstances and rationales governing the judicious application of specific knowledge and strategies.

Secondly, metacognitive regulation, also known as metacognitive strategies (Schraw, 1998), comprises everything connected to the incorporation of learners' metacognitive knowledge in practice, including whatever steps learners engage to control their educational experience (Zhang & Zhang, 2019). Throughout this process, learners will unfailingly employ strategies within their sphere of expertise to achieve their intended objective. Typically, these strategies incorporate formulation, careful monitoring, and thorough evaluation. Planning one's educational journey before engaging in the execution of a problem-solving endeavour, the continuous monitoring of both the course of learning and its resulting product during the act of learning, and the subsequent evaluation of the extent of achievement regarding the educational culmination are all crucial factors in fostering learners' proficient incorporation of the learning process, thereby optimizing the educational outcomes (Schraw, 1998).

Thirdly, deliberate cognitive or emotive actions that are connected to and pertinent to any intellectual activity are known as metacognitive experiences (Flavell, 1979). In the realm of metacognitive experiences, a variety of cognitive processes, such as awareness, unanticipated realizations, ideations, intuitive insights, perceptual apprehensions, affective states, and self-evaluations, collectively manifest in individuals during problem-solving and task completion. These occurrences result in heightened self-awareness (Tarricone, 2011). Metacognitive experiences tend to take place in circumstances that elicit a variety

of cautious, highly deliberate thoughts that may be short lengthy, simple, or intricate (Flavell, 1979).

To sum up, when it comes to learning, effective metacognitive experiences equip learners with the ability to employ relevant strategies for the achievement of their cognitive or metacognitive objectives (Freeman et al., 2017). The development of metacognitive knowledge is intricately intertwined with metacognitive experiences, exerting a substantial influence on future metacognitive encounters. This interaction between metacognitive knowledge and experiences establishes the foundation for metacognitive regulation. The feedback interactions inherent in metacognitive regulation and metacognitive experiences culminate in the iterative refinement of metacognitive knowledge (Zhang & Zhang, 2019).

Self-regulated learning

Self-regulation has been delineated as the inherent ability to autonomously initiate, oversee, and engage in reflective contemplation upon various activities (Zimmerman, 2000). Self-regulated learning implies the application of the concept of self-regulation to the academic context (Dörr & Perels, 2019). Furthermore, Pintrich (2000) identifies SRL as an engaged and purposeful cognitive endeavour, wherein learners proactively establish learning objectives and then strive to vigilantly monitor, regulate, and govern their cognitive processes, motivational impetuses, and behavioural manifestations. These efforts are delicately directed and limited by their pre-established goals and the environment in which they act. Henceforth, the continuous alteration of a person's learning behaviour, such as the self-governing creation of learning plans, careful observation, and independent control of one's educational attempts, is what defines SRL (Veenman & Spaans, 2005).

SRL rests upon a reciprocal interplay inherent within its tripartite constituents, namely motivation, cognition, and metacognition (Adagideli et al., 2017; Dinsmore et al., 2008). These variables influence the effectiveness of learning and are deemed context-related (Zimmerman, 2000). Motivation involves task selection, task initiation, and dedication and perseverance throughout task performance. It encompasses self-motivation, self-efficacy beliefs, and the sustenance of the learning process (Dörrenbächer & Perels, 2015). The cognitive aspect can be interpreted as including conceptual and strategic knowledge, as well as the capacity to perform appropriate strategies (Butler et al., 2017; Winne, 2017).

Furthermore, the metacognitive component is another crucial requirement for the attainment of self-regulated learning. The term pertains to the comprehension and management of an individual's cognitive processes, encompassing the introspective examination and evaluation of one's behaviour and thought patterns (Flavell, 1979). According to the description of self-regulation procedures and prevailing process models (Zimmerman, 2000), SRL comprises the planning, monitoring, moderating, and evaluating of one's learning activities. In other words, metacognition assumes a fundamental role throughout the entirety of the SRL process (Dörr & Perels, 2019).

All in all, the association between metacognitive strategies and SRL is essential to study, as these ideas are closely linked and mutually supportive in the educational setting. Thus, comprehending the relationship between them is critical to maximising educational results and cultivating learners' ability to learn

independently. Given the intricate and interconnected relationship between metacognitive strategies and self-regulated learning, using a systematic review methodology is considered suitable for this project, as it will offer evidence-based contributions to the field of EFL teaching and learning.

Method

The study employed a systematic review approach, which entails a literature review guided by a clear research question and systematic procedures to ascertain which studies within the extant body of literature should be considered (Uman, 2011). It allows for the examination of prior research findings to determine their consistency and applicability to new fields or samples (Turan & Akdag-Cimen, 2020). As a result, it compiles and evaluates all relevant empirical data on the explored subject, offering a comprehensive analysis of research findings (Misra & Ravindran, 2021).

The present study adheres to the systematic review methodology outlined in Bolan et al. (2017). The review procedure consists of three phases: the planning phase, the implementation phase, and the reporting phase. The phases can be seen in Figure 1.

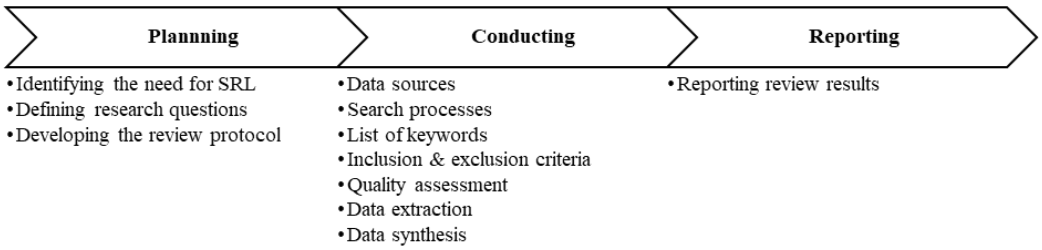

Figure 1. The literature review phases

Planning

The planning process comprises three categories of steps. The first step was identifying the need for SRL. In this regard, although some research has been carried out about metacognitive strategies and SRL, the current body of literature is relatively limited and requires additional exploration. The existing literature offers a basis for comprehending the fundamental principles and plausible associations between metacognitive strategies and SRL; however, further exhaustive investigations are necessary to thoroughly examine this correlation's complexities. Therefore, this systematic literature review aims to address this gap by thoroughly analysing and synthesizing the available literature.

The second step of the planning phase was to define the research questions. The formulation of research questions constitutes a crucial component of a research endeavour. The research inquiries address an issue that will be resolved through the research attempt. Adequately constructed questions function as a framework for identifying research objectives and methodology and facilitating the drawing of conclusions.

The third stage of the planning process was developing the review protocol or procedure. The procedure contains information about data sources, search terms, inclusion and exclusion specifications, search procedures, data extraction, and data synthesis. Teams of researchers devised protocols to make sure that they remained

on track while avoiding bias. In addition, the protocols act as an invaluable asset that can be accessed as needed.

Conducting the review

A systematic review can commence once the review protocol has been established. The first stage of the phase is to determine the data source. With this regard, the Scopus database was utilized to locate studies about the research objectives. Scopus is the most extensive database offering diverse citations and peer reviews across multiple disciplines and written formats, encompassing academic and non-academic works (Shareefa & Moosa, 2020). Besides, Scopus offers a notable benefit over Web of Science (WoS) in terms of its capacity to load sources, which is approximately 70% greater (López-Illescas et al., 2008). Additionally, we conducted an advanced search on Taylor & Francis to locate relevant literature and added three extra papers. Also, we used Google Scholar to find relevant studies.

Following this stage, we determined the list of keywords for the tracking process. The search engine of each database necessitates careful consideration of precision. Hence, it is crucial to ascertain the collection of terminologies linked with the requisite articles. Regarding this study, we conducted the tracking process by employing the terms, such as "metacognitive strategies," "metacognitive regulation," "self-regulated learning," "self-regulation," and "SRL."

After conducting the search process, we filtered the obtained manuscripts by using inclusion and exclusion criteria. This process was conducted since the number of scientific articles is significantly increasing. Consequently, it was difficult to locate articles pertinent to this research. Thus, inclusion and exclusion criteria played a significant role in the selection of required papers. In addition, the criteria are utilized to make sure that each discovered article is considered fairly. Such a process is available in Table 1.

Table 1. Inclusion and exclusion criteria

Inclusion Criteria	Exclusion criteria
Articles containing no fewer than three pages.	Posters or brief articles of less than three pages in length
Authored in English	Not authored in English
Accessible	Not Accessible
Peer-reviewed	Non-peer-reviewed
Empirical studies	Non-empirical studies
Published between January 2012 and December 2022	Not published between January 2012 and December 2022
Journal and conference papers	Opinion pieces or articles
The search parameters appear in the title and keywords.	The search parameters do not appear in the title and keywords.

Furthermore, we conducted an assessment of the obtained papers. The assessment of the SLR is crucial in determining its efficacy in addressing research inquiries, formulating deductions, and providing direction for upcoming studies. It demonstrates that the execution of the literature review has been conducted with a high degree of rigour. Regarding this study, the assessment was conducted using the established rubric by Nan Cenka et al. (2022). There are five questions in the rubric. Each response has the potential for three points, namely "Yes", which equals

two points, indicating that the article accurately meets all required criteria, "Partially", which receives one point, indicating that the article only meets half of the required criteria, and "No", which receives zero points, indicating that the article does not meet any of the requirements. A total score of at least 5 across all questions justified including the article in the research; on the other hand, a score below this threshold results in the article's exclusion.

Table 2. Quality evaluation rubric

Questions	Yes	Partially	No
Is the study's goal well stated?			
Does the study's methodology make sense regarding its intended goals?			
Is the study procedure deemed valid and appropriately designed?			
Are the answers to the research queries sufficient?			
Are the key results spelt out clearly?			

Based on the quality evaluation, we conducted the selection process. The search process was conducted in three distinct databases, namely Scopus, Taylor & Francis, and Google Scholar. These databases were selected as they are globally recognised as a preeminent repository and reliable bibliographic data source for scientific publications (Pranckutė, 2021). We used the Publish or Perish (hereafter PoP) software to assist the selection process. For best results, some filters were used. First, the content type was set as journal articles, conference papers, and book chapters. Second, the publication date was set between 2012 and 2022. Third, the language was set to English. The search process using the PoP software is presented in Figure 2. A total of 56 bibliographies were generated. Furthermore, the results were saved in reference manager software. By referring to the inclusion and exclusion criteria, only five were added to the research.

In addition, we employed Google Scholar and the PoP software to locate other relevant articles. We used the same search parameters as before. By referring to the criteria, we added 13 articles to the study. Finally, we performed a search on Taylor & Francis for relevant articles. However, the PoP software could not conduct the Taylor & Francis search. Therefore, we made use of the website's advanced search menu. Using the criteria as a guide, the search generated three relevant papers from this database. However, two of the generated articles were previously found in a Google Scholar search. From this, only one new article was added. Overall, this study incorporated 19 relevant articles (Figure 3).

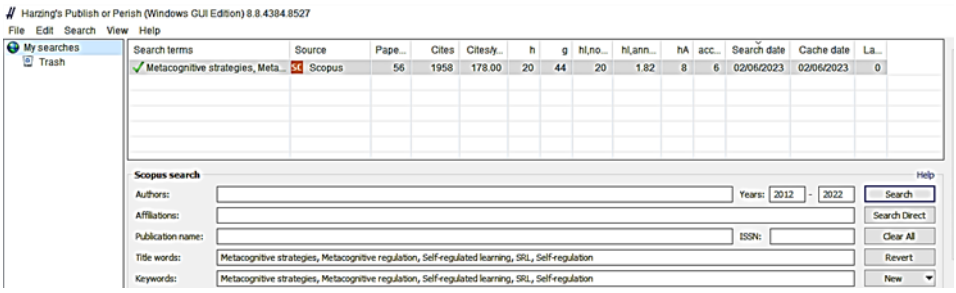

Figure 2. Search process

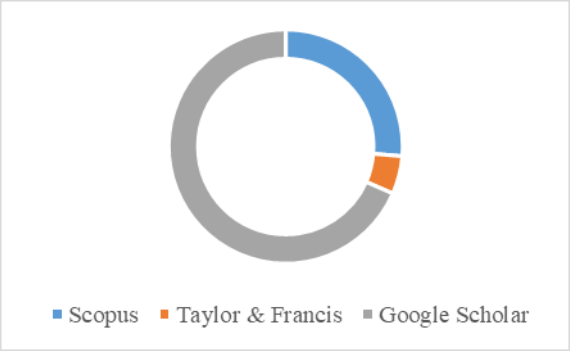

Figure 3. Number of relevant studies

Subsequently, we conducted the final stage of this phase, extracting and synthesizing data. The extraction process is considered essential for obtaining data relevant to the research inquiries. The first author conducted the extraction process, followed by iterative discussions with the other authors to deliberate upon the outcomes. After collecting the appropriate papers, we began conducting content analysis by the research questions. Google Sheets was used to compile the highlighted sections from Zotero. Firstly, we read the entire article and highlighted all essential points. The highlighted data was then entered into a Google spreadsheet. Furthermore, synthesis was conducted to identify findings, conclude, and offer suggestions for future research.

Reporting

This systematic literature review encompasses a comprehensive overview of the various phases involved in conducting a literature review. This review holds significant value for disseminating research and presentation to stakeholders. Additionally, it can function as a resource for other investigators exploring the same subject.

Table 3. Data extraction criteria

Criteria	Description	RQ
Why are metacognitive strategies suitable for promoting SRL?	Similar ideas between metacognitive strategies and SRL	RQ 1
How do metacognitive strategies support SRL?	The role of metacognitive strategies in supporting SRL	RQ 2

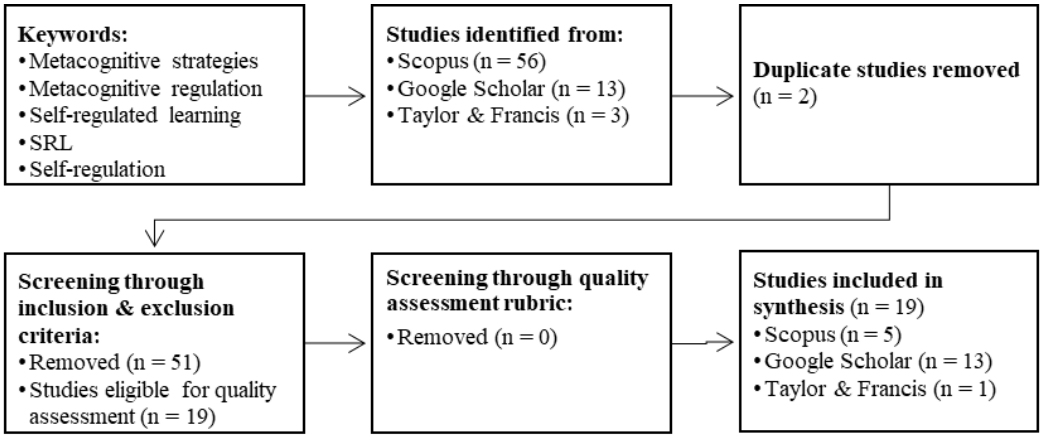

Figure 4. The flow of the selection processes

Findings and Discussion

Why are metacognitive strategies suitable for promoting EFL adult learners' self-regulated learning?

The findings in response to this research question include the empirical-based reasons affirming the suitability of metacognitive strategies in fostering SRL in the realm of EFL. The findings are presented based on the arising key themes, namely 1) the interdependency of metacognitive strategies and SRL, 2) the monitoring, reflecting, and evaluating process in English language learning, 3) the goal setting and strategic planning, and 4) age-related differences in metacognitive capacities.

Interdependency of metacognitive strategies and SRL

The examination of scholarly works presents compelling evidence for the appropriateness of metacognitive strategies in fostering SRL among EFL adult learners. As proclaimed by Knowles (1980), adults in the EFL context are distinguished by certain fundamental principles. They acquire greater autonomy and self-direction. They absorb experience that serves as a resource for education. In addition, these protocols facilitate the navigation of both formal and informal learning within their social and professional domains, focusing learning efforts on performance enhancement rather than merely subject matter. Knowles (1980) contends that when given the chance, EFL adult learners will be able to exhibit a propensity to engage as active participants across all phases of the learning process. Self-directed learning confers this opportunity, thereby stimulating adults to assume a proactive role in their continuous pursuit of language proficiency (Qin & Zhang, 2019). In a similar vein, Vosniadou et al. (2021) affirm that metacognitive strategies and SRL are concerned with learners' knowledge regarding the current state of their learning and the best strategies for monitoring and repairing it to achieve their objectives. In due course, learners will acquire the ability to attain self-regulation through the consistent application of the metacognitive strategies (Zimmerman, 2011).

Furthermore, in EFL learning, the promotion of SRL can be facilitated by the utilization of metacognitive strategies because of the shared characteristics and congruence between these two concepts. Vosniadou et al. (2021) acknowledged that the concepts of SRL explore and seek to comprehend the cognitive, metacognitive, motivational, and affective facets of learning. Metacognitive strategies and SRL are concerned with learners' knowledge of the state of their learning and the most effective strategies for monitoring and repairing it to achieve their objectives (Dignath & Büttner, 2008). In this regard, the use of metacognitive strategies facilitates learners to oversee and direct their learning.

Besides, metacognitive strategies serve a vital role in carrying out self-regulated learning among EFL learners (Akamatsu et al., 2019). More specifically, proficient self-regulatory learners monitor each phase of the language learning journey and exhibit greater awareness regarding when and how to adjust their strategic actions (Paris & Winograd, 1990). They exhibit the capacity to optimize their learning process by applying the metacognitive strategy information they have gained by learning, applying learning strategies, and fulfilling prior task requirements (Karlen, 2016).

Monitoring, reflection, and self-awareness in learning

In the context of EFL teaching and learning, exploring the ideas of metacognitive strategies and SRL is crucial. Such notions encompass the cognitive processes of monitoring and self-awareness, which are essential for promoting successful language acquisition (Dörr & Perels, 2019; Zimmerman, 2000). Monitoring and awareness play a fundamental role in facilitating successful self-regulated language learning by offering learners immediate feedback on their language learning process (Lee & Mak, 2018). During these processes, metacognitive strategies facilitate learners in actively monitoring their cognitive processes, comprehension, and advancement throughout educational endeavours. Through self-observation and reflection, EFL learners can acquire valuable insights regarding the alignment between their cognitive process and their language learning objectives (Mazzoni & Nelson, 2014).

Likewise, SRL in the EFL context is indicated by the ongoing adjustment of an individual's learning behaviour, involving autonomously planning, monitoring, and regulating their language learning activities (Veenman & Spaans, 2005). Through these continuous processes, learners can effectively address their knowledge gaps, areas of confusion, or misconceptions, thereby boosting their language learning experience.

Furthermore, after setting goals for their language learning endeavours, learners attempt to keep an eye on, control, and manage their motivation, behaviour, and cognitive processes (Pintrich, 2000). They are guided and restricted by their goals as well as the contextual characteristics of their language learning environment (Schuster et al., 2020). In other words, SRL not only improves learners' comprehension of the favourable outcomes of their learning endeavours but also promotes the growth of their analytical and evaluative skills (Mekala & Radhakrishnan, 2019).

Additionally, studies have demonstrated that the utilisation of metacognitive strategies can improve cognitive abilities in language learners. It is in line with Zimmerman's (2000) explicating that SRL encompasses various component skills, such as the establishment of specific proximal language learning goals and the adoption of effective strategies to achieve these goals. The process of planning goals, known as the forethought phase (Zimmerman, 2002), facilitates the ability of learners to establish explicit language learning goals, discern the necessary steps to attain the goals and develop effective strategies to accomplish them (Muijs & Bokhove, 2020). In addition, it enables learners to strategically plan their language learning activities and efficiently allocate their resources, thereby promoting the development of self-regulated language learning (Coertjens, 2018).

Goal setting and strategic planning

Metacognitive strategies encompass the deliberate and calculated selection and modification of suitable learning strategies, which become an integral component of self-regulated language learning (Pintrich, 2000). Dökmecioğlu et al. (2022) confirmed that when applying the metacognitive strategies, during the regulating activities, learners conduct ongoing adjustments. Based on the results of the monitoring process, learners adjust their learning activities by revisiting tasks, altering their learning strategies, or slowing down their learning pace (Berger & Karabenick, 2016). Additionally, by applying metacognitive strategies in language

learning, learners are assisted in conducting self-reflection about their strengths, weaknesses, and preferences, thereby encouraging them to choose strategies that correlate with their unique learning style and the current language learning challenges (Zimmerman, 2000). Essentially, metacognition plays a critical role in allowing individuals to modify their strategies in response to challenges or changing circumstances, thereby augmenting their ability to regulate their English language learning through the acquisition of flexibility and problem-solving skills.

Moreover, metacognitive strategies adhere to the act of reflection and assessment of one's learning, which is a key element of SRL in the EFL context. In line with this, Akamatsu et al. (2019) certified in their study that metacognition plays a crucial role in enabling learners to actively engage in introspective thinking about their learning experiences, assess the effectiveness of their learning strategies, and identify areas for improvement. Through such reflective practices, EFL learners gain the opportunity to evaluate their accomplishments in the realm of learning and subsequently make informed decisions on their future learning goals (Mekala & Radhakrishnan, 2019; Muijs & Bokhove, 2020). This procedure enhances the advancement of self-regulated language learning through the cultivation of metacognitive awareness and the promotion of individual development.

Age-related differences in metacognitive capacities

In the realm of EFL teaching and learning, the applicability of metacognitive strategies for mediating adults' SRL has garnered several significant discoveries, highlighting the rationale behind the efficacy in promoting SRL. Firstly, using metacognitive strategies is highly conducive to cultivating SRL in adult learners, owing to their cognitive maturity, pre-existing knowledge, and accumulated life experiences (Schraw et al., 2006). Compared to younger learners, adult language learners frequently exhibit greater self-awareness and autonomy in their learning process (Dörr & Perels, 2019).

While nurturing young children's metacognitive skills is crucial for laying the foundation of self-regulated learning from an early age, their metacognitive capacities are still restricted, especially when it comes to their ability to keep an eye on their cognitive processes and learning behaviours (Bryce et al., 2015; Freeman et al., 2017). Moreover, the deliberate use of meta-memory, which is a crucial part of metacognitive strategies, helps in effectively organising, overseeing, and controlling memory and learning activities (Mazzoni & Nelson, 2014). Dörr and Perels (2019) affirm this viewpoint by acknowledging that as individuals get older, their ability to effectively manage and control these processes tends to improve. In other words, adult learners are likely to have a higher proficiency in using meta-memory, which can improve their ability to control and manage their learning experiences in the EFL context.

Finally, due to their cognitive maturity, EFL adult learners are capable of actively participating in metacognitive processes such as self-reflection and strategic planning. These behaviours are crucial for successful self-regulated learning. This emphasizes the capacity of metacognitive strategies to act as a catalyst for improving SRL in adults who are involved in EFL learning. To sum up, it utilizes their current cognitive abilities and past experiences to support meaningful acquisition of language skills and development of proficiency.

How does metacognitive strategy support adults' self-regulated learning?

The findings of this inquiry encompass empirical-based argumentative elaborations regarding how metacognitive strategies promote EFL adult learners' SRL. The findings are discussed based on the emerging themes, namely metacognitive strategies as a component of SRL and phases of SRL and metacognitive strategies.

Metacognitive strategies as a component of SRL

The role and function of metacognitive strategies are considered critical in promoting EFL learners' SRL. They can be inferred from the role of metacognitive strategies as a key component of SRL (Figure 5).

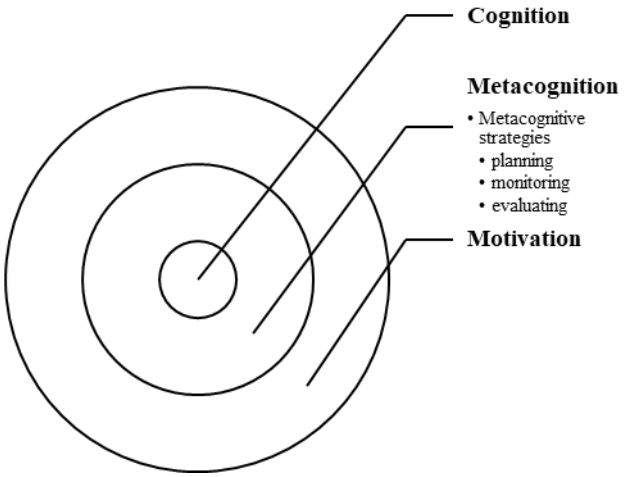

Figure 5. Components of SRL

In the context of EFL learning, SRL involves learners in formulating learning objectives and subsequently exerting endeavours to observe, control, and direct their cognitive processes, motivational drives, and behavioural actions. These efforts are guided and constrained by their predetermined objectives and the surrounding context (Pintrich, 2000). Consequently, the interaction of these three crucial elements, namely cognition, motivation, and metacognition, determines the dynamic and positive nature of SRL (Dörr & Perels, 2019; Schraw et al., 2006).

Concerning cognition, EFL learners employ critical thinking, problem-solving, and cognitive strategies to efficiently digest and assimilate new knowledge. Specifically, metacognition enables them to effectively plan and monitor their language learning activities (Butler & Schnellert, 2012). In addition, motivation, which includes self-efficacy and ethical considerations, has an immense impact on the extent to which learners engage and continue in their language learning efforts. (McDowell, 2019; Schraw et al., 2006).

Furthermore, the concepts of metacognitive strategies and SRL are complementary, as suggested by Zhang and Zhang (2019). Though distinct, they are connected and parallel, exerting an impact on the development and functioning of the human mind and behaviour (Fox & Riconscente, 2008; Riley et al., 2021). In line with this, Dörr and Perels (2019) also found that metacognition, which involves the understanding and management of cognitive processes, serves as a critical condition for self-regulated learning. Likewise, Winne and Hadwin (2008)

acknowledged that SRL is distinguished by the cognitive processes involved in the deliberate planning, continuous monitoring, effective regulation, and comprehensive evaluation of one's learning activities.

When learning English through SRL, EFL learners rely on their metacognitive abilities to establish objectives, choose strategies, and systematize their learning approach to language acquisition. Metacognition enables them to make deliberate decisions regarding the most efficient strategies to employ, based on their awareness of their cognitive strengths and limitations (Lee & Mak, 2018). In addition, metacognition allows learners to track their progress, evaluate their comprehension, and adjust their learning strategies accordingly (Qin & Zhang, 2019). Through metacognition, learners can ruminate on their learning experiences, assess the efficacy of their strategies, and modify their approach to future language learning tasks. This aspect of metacognitive strategies strengthens self-regulated learning in EFL by fostering a more profound awareness of the educational process and enabling learners to consistently enhance their language proficiency.

Phases of self-regulated learning and metacognitive strategies

Mekala and Radhakrishnan (2019) elaborate on the role and function of metacognitive strategies in facilitating learners' SRL in acquiring a foreign language through the description of three learning phases in SRL: the forethought phase, performance phase, and reflective phase (Zimmerman, 2002). In the forethought phase, EFL learners make plans for their learning tasks and set goals. These play a crucial role in establishing successful strategies for language acquisition. This phase also includes improving self-motivation and anticipating learning results, emphasising the significance of metacognitive strategies in empowering learners to analyse, plan, and arrange their language learning goals.

During the performance phase, learners track and evaluate their educational progress in language acquisition owing to the monitoring process facilitated by metacognitive strategies. This monitoring procedure serves as a guide for learners to take control of their language learning process and to take responsibility for accomplishing their objectives (Zhang & Zhang, 2013). Additionally, the monitoring process empowers learners to assess their learning, enabling them to modify their learning plan in response to any decline in their academic progress (Wenden, 2002).

Lastly, the reflective phase encourages EFL learners to engage in introspection on their learning process, thereby enhancing their ability to assess and reflect upon their progress (Mekala & Radhakrishnan, 2019). Using the "evaluation" strategy allows EFL learners to enhance learners' critical thinking skills, as it drives them to thoroughly analyse their language learning efforts. Additionally, this strengthens their capacity for reflective thought and reasoning, allowing them to review and reflect on their performance.

In conclusion, within the field of EFL teaching and learning, including metacognitive strategies into the SRL framework provides a systematic procedure for learners to progress through different phases of language acquisition. Through the utilisation of metacognitive strategies, learners can effectively plan, monitor, and assess their process of language acquisition. Additionally, this approach fosters the development of critical thinking and reflective abilities, which are vital for ongoing progress and success in English language learning.

Conclusion

This systematic literature review has shown the underlying reasons depicting the applicability of metacognitive strategies to mediate EFL adult learners' SRL. As a key element of SRL, metacognitive strategies include the deliberate and anticipated selection and adaptation of appropriate learning procedures. They play a pivotal role in enabling learners to actively engage in reflective thinking about the learning experiences. Also, they assist learners in evaluating the efficacy of their language learning strategies and pinpoint areas in need of development. Furthermore, the result of the study signifies that metacognitive strategies can be used to mediate adults' SRL due to their cognitive maturity, prior knowledge, and life experiences. Accordingly, EFL adult learners usually demonstrate greater self-awareness and autonomy in their learning process when compared to younger ones.

Based on the findings, some practical recommendations and implications are made to guide teachers, policymakers, and practitioners. First, it is crucial to provide opportunities for learners to develop metacognitive strategies, cognitive skills, and motivational factors through explicit instructions and practice within the EFL curriculum. Second, teachers should be provided pieces of training in understanding the role of metacognitive strategies, cognitive skills, and motivation. These will help teachers create a supportive learning atmosphere that fosters learners' autonomy. Third, metacognitive skills should be promoted in other contexts beyond the classroom to allow learners to become more versatile and effective language learners. Future studies can be conducted on elaborating the implementation of metacognitive strategies as well as exploring the effectiveness of the strategies in real-life EFL learning contexts.

Despite the invaluable findings, this systematic review has some limitations. Not all articles explicitly provide the information that researchers need, such as the methodology or design that was employed. This potentially limits the depth of the analysis. Moreover, the selection of articles for collection was determined solely by the terms incorporated in the titles and authorships. This may have resulted in the exclusion of relevant research that did not explicitly employ the given keywords. The limitations mentioned underscore the need for additional extensive study on the subject to broaden our comprehension of metacognitive interventions in EFL learning environments.

Acknowledgement

The authors express their gratitude to the reviewers for their insightful feedback and recommendations. In addition, the authors are delighted to express their appreciation to the Indonesian Endowment Fund for Education (*Lembaga Pengelola Dana Pendidikan*), which operates under the auspices of the Ministry of Finance of the Republic of Indonesia, for providing support in completing the study.

References

Adagideli, F. H., Saraç, S., & Ader, E. (2017). Assessing preschool teachers' practices to promote self-regulated learning. *International Electronic Journal of Elementary Education, 7*(3), 423–440.

Akamatsu, D., Nakaya, M., & Koizumi, R. (2019). Effects of metacognitive strategies on the self-regulated learning process: The mediating effects of self-efficacy. *Behavioral Sciences*, *9*(12), 128. https://doi.org/10.3390/bs9120128

Amini, D., Anhari, M. H., & Ghasemzadeh, A. (2020). Modeling the relationship between metacognitive strategy awareness, self-regulation and reading proficiency of Iranian EFL learners. *Cogent Education*, *7*(1), 1-17. https://doi.org/10.1080/2331186X.2020.1787018

Azevedo, R., & Aleven, V. (2013). Metacognition and learning technologies: An overview of current interdisciplinary research. In R. Azevedo & V. Aleven (Eds.), *International handbook of metacognition and learning technologies* (Vol. 28, pp. 1–16). New York: Springer. https://doi.org/10.1007/978-1-4419-5546-3_1

Berger, J.-L., & Karabenick, S. A. (2016). Construct validity of self-reported metacognitive learning strategies. *Educational Assessment*, *21*(1), 19–33. https://doi.org/10.1080/10627197.2015.1127751

Bolan, A., Cherry, G., & Dickson, R. (2017). *Doing a systematic review: A student's guide* (2nd ed.). London: SAGE Publications.

Bryce, D., Whitebread, D., & Szűcs, D. (2015). The relationships among executive functions, metacognitive skills and educational achievement in 5 and 7 year-old children. *Metacognition and Learning*, *10*(2), 181–198. https://doi.org/10.1007/s11409-014-9120-4

Butler, D. L., & Schnellert, L. (2012). Collaborative inquiry in teacher professional development. *Teaching and Teacher Education*, *28*(8), 1206–1220. https://doi.org/10.1016/j.tate.2012.07.009

Butler, D., Schnellert, L., & Perry, N. E. (2017). *Developing self-regulating learners*. Don Mills, ON: Pearson Canada Inc.

Cabrera-Solano, P. (2019). Using visual vocabulary app as a metacognitive strategy in EFL learning: A case of pre-service teachers. *International Journal of Learning, Teaching and Educational Research*, *18*(12), 302–315. https://doi.org/10.26803/ijlter.18.12.17

Chen, J. C. (2014). Teaching nontraditional adult students: Adult learning theories in practice. *Teaching in Higher Education*, *19*(4), 406–418. https://doi.org/10.1080/13562517.2013.860101

Chou, M. H. (2017). A task-based language teaching approach to developing metacognitive strategies for listening comprehension. *International Journal of Listening*, *31*(1), 51–70. https://doi.org/10.1080/10904018.2015.1098542

Coertjens, L. (2018). The relation between cognitive and metacognitive processing: Building bridges between the SRL, MDL, and SAL domains. *British Journal of Educational Psychology*, *88*(1), 138–151. https://doi.org/10.1111/bjep.12214

Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students: A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning*, *3*(3), 231–264. https://doi.org/10.1007/s11409-008-9029-x

Dinsmore, D. L., Alexander, P. A., & Loughlin, S. M. (2008). Focusing the conceptual lens on metacognition, self-regulation, and self-regulated learning. *Educational Psychology Review*, *20*(4), 391–409. https://doi.org/10.1007/s10648-008-9083-6

Dökmecioğlu, B., Tas, Y., & Yerdelen, S. (2022). Predicting students' critical thinking dispositions in science through their perceptions of constructivist learning environments and metacognitive self-regulation strategies: A mediation analysis. *Educational Studies*, *48*(6), 809–826. https://doi.org/10.1080/03055698.2020.1833838

Dörr, L., & Perels, F. (2019). Improving metacognitive abilities as an important prerequisite for self-regulated learning in preschool children. *International Electronic Journal of Elementary Education*, *11*(5), 449–459. https://doi.org/10.26822/iejee.2019553341

Dörrenbächer, L., & Perels, F. (2015). Volition completes the puzzle: Development and evaluation of an integrative trait model of self-regulated learning. *Frontline Learning Research*, *3*(4), 14–36. https://doi.org/10.14786/flr.v3i4.179

Efklides, A., & Metallidou, P. (2020). Applying metacognition and self-regulated learning in the classroom. In L. Zhang (ed.), *The Oxford research encyclopedia of educational psychology*. Oxford: Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.961

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, *34*(10), 906–911. https://doi.org/10.1037/0003-066X.34.10.906

Flavell, J. H. (1981). Cognitive monitoring. In W. P. Dickson (Ed.), *Children's oral communication* (pp. 35–60). New York: Academic Press.

Fox, E., & Riconscente, M. (2008). Metacognition and self-regulation in James, Piaget, and Vygotsky. *Educational Psychology Review*, *20*(4), 373–389. https://doi.org/10.1007/s10648-008-9079-2

Freeman, E. E., Karayanidis, F., & Chalmers, K. A. (2017). Metacognitive monitoring of working memory performance and its relationship to academic achievement in grade 4 children. *Learning and Individual Differences*, *57*, 58–64. https://doi.org/10.1016/j.lindif.2017.06.003

Harputlu, L., & Ceylan, E. (2014). The effects of motivation and metacognitive strategy use on EFL listening proficiency. *Procedia - Social and Behavioral Sciences*, *158*, 124–131. https://doi.org/10.1016/j.sbspro.2014.12.056

Heaysman, O., & Kramarski, B. (2022). Enhancing students' metacognition, achievement and transfer between domains: Effects of the simulative "SRL-AIDE" parallel teacher–student program. *International Journal of Educational Research*, *116*, 102074. https://doi.org/10.1016/j.ijer.2022.102074

Karlen, Y. (2016). Differences in students' metacognitive strategy knowledge, motivation, and strategy use: A typology of self-regulated learners. *The Journal of Educational Research*, *109*(3), 253–265. https://doi.org/10.1080/00220671.2014.942895

Kellenberg, F., Schmidt, J., & Werner, C. (2017). The adult learner: Self-determined, self-regulated, and reflective. *Journal of Pedagogy and Psychology "Signum Temporis,"* *9*(1), 23–29. https://doi.org/10.1515/sigtem-2017-0001

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy* (2nd ed.). Cambridge: Cambridge Adult Education.

Knowles, M. S., Holton Iii, E. F., & Swanson, R. A. (2005). *The adult learner* (6th ed.). London: Routledge. https://doi.org/10.4324/9780080481913

Lee, I., & Mak, P. (2018). Metacognition and metacognitive instruction in second language writing classrooms. *TESOL Quarterly*, *52*(4), 1085–1097. https://doi.org/10.1002/tesq.436

Leopold, C., & Leutner, D. (2015). Improving students' science text comprehension through metacognitive self-regulation when applying learning strategies. *Metacognition and Learning*, *10*(3), 313–346. https://doi.org/10.1007/s11409-014-9130-2

López-Illescas, C., De Moya-Anegón, F., & Moed, H. F. (2008). Coverage and citation impact of oncological journals in the Web of Science and Scopus. *Journal of Informetrics*, *2*(4), 304–316. https://doi.org/10.1016/j.joi.2008.08.001

Maftoon, P., & Alamdari, E. F. (2020). Exploring the effect of metacognitive strategy instruction on metacognitive awareness and listening performance through a process-based approach. *International Journal of Listening*, *34*(1), 1–20. https://doi.org/10.1080/10904018.2016.1250632

Marboot, K., Roohani, A., & Mirzaei, A. (2020). Investigating Iranian EFL students' metacognitive online reading strategies, critical thinking, and their relationship: A mixed-methods study. *Issues in Language Teaching*, *9*(1). 151-182. https://doi.org/10.22054/ilt.2020.50833.475

Mazzoni, G., & Nelson, T. O. (Eds.). (2014). *Metacognition and cognitive neuropsychology*. New York: Psychology Press. https://doi.org/10.4324/9781315805733

McDowell, L. D. (2019). The roles of motivation and metacognition in producing self-regulated learners of college physical science: A review of empirical studies. *International Journal of Science Education*, *41*(17), 2524–2541. https://doi.org/10.1080/09500693.2019.1689584

Mekala, S., & Radhakrishnan, G. (2019). Promoting self-regulated learning through metacognitive strategies. *IUP Journal of Soft Skills*, *13*(2), 21–27.

Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New Directions for Adult and Continuing Education*, *2001*(89), 3-14. https://doi.org/10.1002/ace.3

Misra, D. P., & Ravindran, V. (2021). Systematic reviews: Current perspectives and future directions. *Journal of the Royal College of Physicians of Edinburgh*, *51*(3), 218–220. https://doi.org/10.4997/jrcpe.2021.303

Muijs, D., & Bokhove, C. (2020). *Metacognition and self-regulation: Evidence review*. London: Education Endowment Foundation.

Nan Cenka, B. A., Santoso, H. B., & Junus, K. (2022). Using the personal learning environment to support self-regulated learning strategies: A systematic literature review. *Interactive Learning Environments*, 1–17. https://doi.org/10.1080/10494820.2022.2120019

Nelken, M. L. (2009). Negotiating classroom process: Lessons from adult learning. *Negotiation Journal*, *25*(2), 181–194. https://doi.org/10.1111/j.1571-9979.2009.00219.x

Paris, S. G., & Winograd, P. (1990). Promoting metacognition and motivation of exceptional children. *Remedial and Special Education*, *11*(6), 7–15. https://doi.org/10.1177/074193259001100604

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451–502). New York: Academic Press. https://doi.org/10.1016/B978-012109890-2/50043-3

Pitenoee, M. R., Modaberi, A., & Ardestani, E. M. (2017). The effect of cognitive and metacognitive writing strategies on content of the Iranian intermediate EFL learners' writing. *Journal of Language Teaching and Research*, *8*(3), 594-600. https://doi.org/10.17507/jltr.0803.19

Pranckutė, R. (2021). Web of Science (WoS) and Scopus: The titans of bibliographic information in today's academic world. *Publications*, *9*(1), 1-59. https://doi.org/10.3390/publications9010012

Qin, L., & Zhang, L. J. (2019). English as a foreign language writers' metacognitive strategy knowledge of writing and their writing performance in multimedia environments. *Journal of Writing Research*, *11*(2), 393–413. https://doi.org/10.17239/jowr-2019.11.02.06

Riley, I., Jahan, S., Marshall, A., Walter, C., & Gamble, R. F. (2021). Evaluating verification awareness as a method for assessing adaptation risk. *Future Generation Computer Systems*, *119*, 110–135. https://doi.org/10.1016/j.future.2021.01.034

Schleicher, A. (2019). *PISA 2018: Insights and interpretations*. Paris: OECD Publishing.

Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science*, *26*(1/2), 113–125. https://doi.org/10.1023/A:1003044231033

Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, *36*(1–2), 111–139. https://doi.org/10.1007/s11165-005-3917-8

Schuster, C., Stebner, F., Leutner, D., & Wirth, J. (2020). Transfer of metacognitive skills in self-regulated learning: An experimental training study. *Metacognition and Learning*, *15*(3), 455–477. https://doi.org/10.1007/s11409-020-09237-5

Shareefa, M., & Moosa, V. (2020). The most-cited educational research publications on differentiated instruction: A bibliometric analysis. *European Journal of Educational Research*, *9*(1), 331–349. https://doi.org/10.12973/eu-jer.9.1.331

Shih, H. J., & Huang, S. C. (2020). College students' metacognitive strategy use in an EFL flipped classroom. *Computer Assisted Language Learning*, *33*(7), 755–784. https://doi.org/10.1080/09588221.2019.1590420

Stebner, F., Schuster, C., Weber, X.-L., Greiff, S., Leutner, D., & Wirth, J. (2022). Transfer of metacognitive skills in self-regulated learning: Effects on strategy application and content knowledge acquisition. *Metacognition and Learning*, *17*(3), 715–744. https://doi.org/10.1007/s11409-022-09322-x

Tarricone, P. (2011). *The taxonomy of metacognition*. London: Psychology Press. https://doi.org/10.4324/9780203830529

Tauber, S. K., & Ariel, R. (2023). Emerging trends in research on self-regulated learning and implications for education: An introduction to the special issue. *Journal of Intelligence*, *11*(3), 52. https://doi.org/10.3390/jintelligence11030052

Teng, L. S. (2021). Individual differences in self-regulated learning: Exploring the nexus of motivational beliefs, self-efficacy, and SRL strategies in EFL writing. *Language Teaching Research*, *28*(2). 366-388. https://doi.org/10.1177/13621688211006881

Teng, M. F. (2022). Effects of cooperative–metacognitive instruction on EFL learners' writing and metacognitive awareness. *Asia Pacific Journal of Education*, *42*(2), 179–195. https://doi.org/10.1080/02188791.2020.1835606

Turan, Z., & Akdag-Cimen, B. (2020). Flipped classroom in English language teaching: A systematic review. *Computer Assisted Language Learning*, *33*(5–6), 590–606. https://doi.org/10.1080/09588221.2019.1584117

Uman, L. S. (2011). Systematic reviews and meta-analyses. *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal De l'Academie Canadienne De Psychiatrie De L'enfant Et De L'adolescent*, *20*(1), 57–59.

Veenman, M. V. J., & Spaans, M. A. (2005). Relation between intellectual and metacognitive skills: Age and task differences. *Learning and Individual Differences*, *15*(2), 159–176. https://doi.org/10.1016/j.lindif.2004.12.001

Vosniadou, S., Darmawan, I., Lawson, M., J., Deur, P. V., Jeffries, D., & Wyra, M. (2021). Beliefs about the self-regulation of learning predict cognitive and metacognitive strategies and academic performance in pre-service teachers. *Metacognition and Learning*, *16*(3), 523–554. https://doi.org/10.1007/s11409-020-09258-0

Wallace, M. P., Li, V. M., Huang, T. C., & He, N. C. (2021). Metacognitive strategy use for EFL readers: Differences in gender and reading ability. *TESL-EJ*, *25*(2), 1-22.

Wenden, A. L. (2002). Learner development in language learning. *Applied Linguistics*, *23*(1), 32–55. https://doi.org/10.1093/applin/23.1.32

Winne, P. H. (2017). Cognition and metacognition within self-regulated learning. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed.) (pp. 36–48). New York: Routledge. https://doi.org/10.4324/9781315697048-3

Winne, P. H., & Hadwin, A. F. (2008). The weave of motivation and self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 297–314). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Yilmaz, R. M., & Baydas, O. (2017). An examination of undergraduates' metacognitive strategies in pre-class asynchronous activity in a flipped classroom. *Educational Technology Research and Development*, *65*(6), 1547–1567. https://doi.org/10.1007/s11423-017-9534-1

Zaky, H. (2021). Self-regulation and adult learners: Investigating the factors enhancing deliberate practice in composition classes. *International Journal of Curriculum Development and Learning Measurement*, *2*(2), 45–60. https://doi.org/10.4018/IJCDLM.2021070104

Zhang, D., & Zhang, L. J. (2019). Metacognition and self-regulated learning (SRL) in second/foreign language teaching. In X. Gao (Ed.), *Second handbook of English language teaching* (pp. 1–15). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-58542-0_47-1

Zhang, L. J. (2010). A dynamic metacognitive systems account of Chinese university students' knowledge about EFL reading. *TESOL Quarterly*, *44*(2), 320–353.

Zhang, L. J., & Zhang, D. (2013). Thinking metacognitively about metacognition in second and foreign language learning, teaching, and research: Toward a dynamic metacognitive systems perspective. *Contemporary Foreign Language Studies*, *396*(12), 111–121. https://doi.org/10.3969/j.issn.1674-8921.2013.12.010

Zimmerman, B. J. (2000). Attaining self-regulation. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.) *Handbook of self-regulation* (pp. 13–39). New York: Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J. (2011). Motivational sources and outcomes of self-regulated learning and performance. In B. J. Zimmerman & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 49–64). New York: Routledge.