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# From Theory to Practice: Exploring Metacognition and Its Role in Grammar Learning

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## ABSTRACT

The teaching and learning of grammar have been posing challenges in language instruction for many years. Diverse theoretical perspectives have led to several approaches, methods and techniques/strategies for teaching and learning grammar. This paper explores the potential significance of metacognitive strategies among the language learners to enhance their grammar skills and accuracy in writing and speaking English. It explores the theoretical foundations of metacognition and the role of metacognitive strategies in learning, emphasising their ability for deeper cognitive engagement. Furthermore, the paper defines grammar, reviews various instructional practices in grammar teaching, and highlights the potential role of metacognitive strategies in enhancing the effectiveness of the grammar learning process and contributing to more efficient grammar-acquiring skills, which promotes autonomy among learners. The paper concludes by outlining future research directions and emphasising the need for empirical studies using metacognitive strategies and grammar learning.

***Keywords:*** Metacognition; Metacognitive Strategies; English Grammar; Grammar Teaching and Learning Strategies; Language Learning Strategies

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# 1. Introduction

People study English as a Foreign Language (EFL) or English as a Second Language (ESL) for academic and professional development. Pondering the reasons for learning the English language, many conclude that communication fosters understanding and creates better job opportunities and bonds with speakers of other languages[1]. Grammar is the core component of language learning, especially for ESL and EFL learners. However, grammar instruction is perhaps the only subject that has attracted little attention in pedagogy after the 'zero grammar option' proposed by Krashen[2], and this idea is still active with studies, having seen several discussions and extensive investigations with both for and against arguments. Teaching grammar has long been a divisive subject among scholars, researchers, educators, policymakers, and teachers. Some academics contend that grammar should be taught as a collection of precise rules, while others maintain that language should be taught as native speakers and authors use it since it is flexible and constantly changing. With the advent of new approaches, methods, and techniques, the perspective of 'to teach or not to teach grammar' has become a topic of debate. In the past, grammar research concentrated mainly on instruction rather than learning[3]. The paper aims to highlight the usage of metacognitive strategy instruction in Grammar learning. It begins by defining metacognition and tracing its historical development. It then explores metacognitive models, outlines metacognitive components and subcomponents and the role of metacognitive strategies in language learning. Subsequently, the focus shifts to grammar, where the paper defines grammar and discusses various views and challenges about teaching and learning grammar. Further, it explores approaches and methods to grammar teaching and discusses grammar learning strategies, specifically metacognitive strategies, for a better grammar learning experience. Lastly, it examines the published literature and discusses future research possibilities, followed by a conclusion.

# 2. Metacognition

Understanding the origins and conceptual evolution of metacognition and its constituents helps improve the comprehension of its current applications and usage of metacognition in English language learning and Grammar learning. One effective strategy to encourage students' performance in learning the English language and its grammar across their learning spectrum regardless of their age is to assist them in developing their metacognitive strategies. Flavell[4] first conceptualised the term metacognition. Therefore, he is widely considered as the 'father of metacognition'. The term came into existence from developmental and cognitive psychology research on awareness and monitoring of memory, known as 'metamemory', which eventually gave rise to metacognition[4]. During the 1970s and 80s, research on metacognition became prominent and was grouped under neuropsychology, developmental psychology and educational psychology[5]. Significant empirical and theoretical research on metacognition is now being conducted in all these domains. One of the biggest concerns is the abundance of definitions of metacognition across these fields. The abundance of definitions presents multiple constructs, assumptions, processes, and procedures, thereby preventing a single comprehensive definition of metacognition[6]. Metacognition and Self-regulated learning (SRL) are used interchangeably across domains. Metacognition refers to thinking about one's own cognitive processes, calibration denotes a learner's capacity to monitor properly, while self-regulation refers to learners making decisions about their subsequent actions depending on their understanding[7]. They self-regulate by modifying their ideas and behaviours while planning future activities[7]. It is widely acknowledged that learners with strong metacognitive abilities self-regulate their learning efficiently. Flavell[4] originally defined metacognition as "knowledge and cognition about cognitive phenomena" It is now generally defined more broadly as "cognition about cognitive phenomena"[4], whereas some scholars and researchers define it as "thinking about thinking"[8–10]; "cognition about cognition"[11] or "knowing about knowing"[12]. According to Carson[13], such short descriptions give the 'ontological roots' of metacognition but hardly offer any direction to 'epistemological or axiological perspectives'. Building upon a foundation of metacognitive understanding, we now examine its developmental progression.

# 3. Evolution of Metacognition

Spearman[14] traced the origins of the theory of reflection, which led to the conceptualisation of metacognition. He

recalls philosophers such as Plato, Aristotle, Strato, Alexander, Polonious and Locke as those who emphasised the power of reflection. Socrates, in 399 BC, asserted that life is pointless without reflection. Though Aristotle (384 BC) believed that memory plays a greater role in cognising mental representations, he never used the term 'reflection' [15]. According to Augustine of Hippo, also known as Saint Augustine (354 AD), the mind knows itself through a continuous analysis. He further discusses memory and the reflective process [16]. Later, Descartes, through his famous axiom, 'I think therefore I exist', sets forth his idea on reflection and knowledge of self[17]. Spinoza talks about reflection, knowledge of self, metacognitive processes and self-awareness of one's learning procedures, thus forming a connection between reflection and processes of metacognition [18]. Subsequently, James [19, 20] talks about problem-solving and situation analysis. Early educational researcher Dewey investigates the significance of reflection and its role in problem-solving [21, 22]. Lock used the word 'reflection' to denote the perception of a state of mind. Piaget later used this concept in his work [23]. Consequently, Piaget's theory of higher-order reasoning discusses reflective procedures and metacognition [18, 24]. In due course, Vygotsky theorised the social construction of knowledge, highlighting the concept of the zone of proximal development (ZPD), scaffolding, verbalisation, and internal verbalisation. Following him, Bruner [25] affirmed that ZPD and internal verbalisation are aspects of metacognition. Down the line, Habermas' theory of individual and social reflection and social cognitive emancipation helped understand reflection. Dewey and Haberman's theories have led to the development of King and Kitchener's reflective judgement model [22]. Dewey focuses on the individual's reflection in problem-solving, whereas Vygotsky and Habermas support social contexts in problem-solving. Though none of the philosophers and educational researchers have explicitly used the term metacognition, they have set the context for us to understand metacognition and in theorising the theory itself. Flavell, after conceptualising the term, developed his own metacognitive model. Later, many scholars have created their own models of metacognition to enhance and expand its understanding.

# 4. Models of Metacognition

Flavell, in his model, classifies metacognition as metacognitive knowledge, metacognitive experience, goals, tasks, and strategies [4]. To him, metacognitive knowledge is the element in an individual's information compendium. Metacognitive experience is a learner's emotion or attitude during, before, or after completing the task. Flavell relates goals and tasks to cognitive operation, while strategies and actions indicate efforts to realise the aims and objectives [4]. Kluwe [26] formulated a new metacognition model, largely based on Flavell's model of 1979. He further classified metacognition into cognitive knowledge and executive control. Cognitive knowledge is 'stored information' about one's own thinking, while executive control monitors the usage and outcomes of cognitive solutions. It also establishes one's cognitive patterns. Later, Brown [27] developed a model of metacognition, which contained two sub-parts: knowledge about cognition and regulation of cognition. Knowledge about cognition aids the reflective aspects and indicates what learners know about cognitive processes. On the other hand, the regulation of cognition shows the actions that contribute to the regulation and monitoring of one's learning. Thereafter, Jacobs and Paris [9] modelled the theory of self-appraisal. In due course, Schraw and Dennison [28] christened it as knowledge of cognition. This was also referred to as self-evaluation [29]. It is divided into three kinds of knowledge: Declarative, Procedural and Conditional. Declarative Knowledge influences one's performance as it directly relates to the self as a learner. Procedural knowledge indicates executing procedural skills, whereas conditional knowledge directs a person to know when and where to apply certain strategies or particular cognitive activities. The offshoot of Jacob and Paris' model of metacognition is self-management, which refers to the learned demonstration of an individual's behaviour [29]. Nelson [30] framed an alternate metacognitive model consisting of two levels: senior level and target levels. These two levels contain a 'symmetric relationship' and are linked to one another [29]. Monitoring is triggered at the onset of a problem at the target level during the flow of information, and the control system takes the initiative to notify these planes at the senior level. Additionally, Nelson [30] mentions three phases of learning: acquisition, storing of information, and examining by recollecting the information. Besides, Schraw and Moshman [31] crafted a model of metacognition, which was not only based on Flavell's model [4] but also Brown [27], and Paris and Winograd [32]. This model implies two dimensions of metacog-

nition, namely Knowledge of Cognition and Regulation of Cognition. The former dimension refers to one's own cognition in general, while the latter is directed at the regulatory processes. Next, Tobias and Everson [33] formulated a model of metacognition that contains subcategories such as planning, strategy selection, evaluation of one's learning and monitoring information. This model is innovative and different from others because it continuously monitors all these stages. Eventually, Efklides [34] designed a model and classified metacognition into three categories: social, individual awareness and non-cognitive levels. It also contains different dimensions: Metacognitive Knowledge, Metacognitive Experiences and Metacognitive Skill, thus differing from Nelson and Naren's model. Here, metacognitive knowledge implies an individual's goals, strategies and duties, and argues that metacognitive experience guides a person to use metacognitive knowledge in the right space. Metacognitive skills refer to the correct choice of strategy throughout the learning process. The recent Model-free Metacognition proposed by Carruthers and Williams [35] underscores the idea that model-based metacognition was largely used in human and non-human metacognitive investigations. Conversely, some animal-based models of metacognition fail to replicate the results in humans, thereby paving the way for a proposal on model-free metacognition in humans and animals. These are the major metacognitive models in global ELT research. A detailed understanding of these models reveals key components that explain the metacognitive process.

# 5. Components of Metacognition

Tarricone [18] developed a conceptual framework and taxonomy of metacognition. A renowned scholar in the field of Metacognition, Professor David Moshman, praises Tarricone's work as "an unrivalled overview of the concept of metacognition" [18]. She combined all the elements suggested by preceding scholars, authors and researchers from this field, thus making a valuable framework for educational research [36].

Tarricone's taxonomy consists of two core components: 1. Knowledge of Cognition and 2. Regulation of Cognition. As mentioned earlier, the former stands for knowledge about one's own cognitive processes, and the latter stands for using those cognitive processes. The first core component of Knowledge of Cognition can be divided into three super-categories: 1.1. Declarative Knowledge 1.2. Procedural Knowledge 1.3. Conditional Knowledge. Declarative knowledge refers to one's skills, processing ability and intellectual possessions. Procedural Knowledge, conversely, discusses how a task has to be carried out using various strategies, while conditional knowledge is knowing when and where to use a particular strategy for a specific task [37]. Declarative knowledge can be further divided into two 1.1.1. Domain Knowledge 1.1.2. Cognitive Knowledge. Domain knowledge is the information repository of various domains, and Cognitive Knowledge is 'stored assumptions, hypotheses and beliefs about thinking' [26, 36]. According to Baker and Brown [38], Procedural Knowledge involves planning, monitoring, checking, evaluating and revising; these are also mentioned in the Regulation of Cognition, the second metacognitive core component. Subcategories spread across the super-categories, according to Tarricone [18]; they should be considered interconnected, not hierarchical. The subcategories are i. knowledge of oneself/others ii. knowledge of task and context iii. knowledge of the strategy. These subcategories are self-explanatory.

The second core component of the Regulation of Cognition is sometimes called Metacognitive Control or Metacognitive Skills. This involves super-categories 2.1. Executive Functions 2.2. Metacognitive Experiences. Unlike knowledge of cognition, Regulation of Cognition refers to the practical usage of the strategies [36, 39]. Executive controls are further classified into the following subcategories: 2.1.1. Monitoring and Control 2.1.2. Self-regulation. Monitoring and control involve executive functions such as goal setting, planning, information organisation, control, clarity monitoring, regulation, and accuracy. Self-regulation, as a term, is self-explanatory and an important subcategory. It would be lacking without other metacognitive processes being involved in the self-regulatory process [18]. The Super-category of Metacognitive Experiences is further classified into the following subcategories: 2.2.1. Metacognitive Judgements 2.2.2. Metacognitive Feelings. Metacognitive feelings are learning experiences that relate to a person's cognitive capabilities and processes [40]. Metacognitive judgements are 'feelings of knowing' or 'judgement of knowing' something in terms of learning/knowledge. Here, all four subcategories use the variables i. person ii. task and iii. strategy. These

variables adapt and add to the subcategories. As mentioned earlier, in metacognition, every component should be considered as interconnected, not hierarchical. The following discussion highlights the significance of metacognitive strategies.

## 6. Metacognitive Strategies

Principally, education must help students become effective and autonomous learners. This is where the metacognitive strategies become essential as they are pedagogically learner-centred. Metacognitive skills are often referred to as 'bosses' while cognitive skills are identified as 'workers' because the mental processes determined by metacognition are brought forth by cognition [41]. Learners use metacognitive strategies to plan, monitor and evaluate their own thinking and learning process [42]. The metacognitive strategy usage effectively improves metacognitive knowledge and metacognitive skills [43]. Appropriate strategy selection and resource organisation are the steps involved in an effective planning phase. Students who plan can better accomplish their learning objectives and manage their learning process [41, 44]. In the monitoring phase, one is aware of what he/she is doing; the learner, in this phase, tracks the progress towards goals by integrating feedback and self-tests to manage learning and assesses the learning environment by critically evaluating the effectiveness of strategies and plans incorporated, which together help the learners to assess the learning demands, refine the outcomes and develop more advanced models to enhance one's learning [41, 45, 46]. In the evaluation phase, one assesses the efficiency and outcome of learning by reviewing progress towards the goal made by planning and monitoring, ultimately serving as the reflection on the learning process and learning [41, 44]. Consequently, it is universally acknowledged that metacognition has a high capability of helping students become accomplished learners [47]. Having explored the role of metacognitive strategies in learning, the discussion now examines the theoretical perspective of Schraw and Moshman.

## 7. Metacognitive Theories

Schraw and Moshman [31] define 'metacognitive theories' as the systemic framework that explains and regulates the thinking process. They classify these metacognitive theories into three types: tacit, explicit but informal, and explicit and formal. The crucial difference among them is highlighted using the criteria from cognitive developmental research [48]. They describe tacit theory as unconsciously forming or acquiring assumptions or beliefs from personal experiences, peer interactions, teachers and cultural influences. As these theories are implicit and deeply embedded, they resist change. Further, they consider informal theories as 'fragmentary' because the understanding and belief of knowledge are present to a certain degree, but they are incomplete and lack comprehensible structures. As individuals face new experiences, they can gradually become formalised because the latter holds a certain degree of explicit metacognition. Finally, Schraw and Moshman emphasise that the formal theories are 'systematized'. They are rare because of their explicit nature; if present, they significantly impact performance. A person who uses the strategy efficiently is a formal metacognitive theorist. A formal theorist can make self-regulatory decisions. Schraw and Moshman also state that a good strategy user is one who effectively recollects necessary knowledge, employs strategies naturally, distributes resources wisely, and stays motivated to gain a deeper understanding [31]. This approach reflects effective learning, but individual awareness and use of strategy evolve with reflection and experience.

Having explored the theory of metacognition, the discussion now shifts to grammar. Here, we explore the history of grammar teaching, diverse perspectives and challenges for grammar teaching and learning, and various approaches, methods and strategies for grammar teaching and learning, with emphasis on metacognitive strategies' impact on grammar learning. Further, we address future research possibilities by highlighting the potential of metacognitive strategies in transforming grammar instruction into a learner-centred process with the help of teachers in developing their strategic behaviour.

## 8. Grammar

Originating from the Ancient Greek term 'grammatike', grammar means "relating to written language". Along with logic and rhetoric, grammar was one of the core subjects of the liberal arts in ancient Greece, and later, by the fifth century BC, it developed into a more inclusive field of study in

Rome, covering not only the laws of language structure but also literary history, textual criticism, and aesthetic analysis. This method of teaching grammar continued in medieval Europe, where it was a subject of the trivium, the three core courses taught in colleges and universities: logic, rhetoric, and grammar[49, 50]. In the British Isles, the study of English grammar did not begin until the 16th century because, until then, formal language education primarily focussed only on classical languages such as Latina and Greek[49, 51]. Pedagogically, though grammar is currently not taught as a separate subject in the curriculum, it still holds its place in second language (L2) teaching. According to Rahman and Ahmed[52], an L2 learner must deliberately work to master the grammatical aspects of the language, suggesting that grammar may be more significant to them than to a native speaker who has naturally internalised the language's grammar. For linguists, the word 'grammar' means many things based on their field of study. Chomskyan tradition (Transformational Grammar) explains it as cognitive rules of sentence generation, while Hallidayans (Structural Functional Grammar) emphasise social choices that shape language choices[53]. Pedagogical grammar refers to grammatical instruction and analysis crafted to meet the needs of L2 learners[54]. In pedagogy, grammar teaching has long been controversial between descriptive and prescriptive grammarians. Prescriptive grammar "lays down rules to which all usage must confirm"[55]. On the other hand, descriptive grammar lays down the structure of language and its rules as they are applied in everyday situations, both standard and nonstandard forms[56]. Building on the perspective of acquiring grammar in the natural setting, some educators argued that it is detrimental and ineffective[57–59]. Though grammar is fundamental in English Language Teaching (ELT), it does not receive the attention it merits[49]. For over 25 centuries prior to this, grammar learning was considered central.

## 9. Views on Grammar Learning

Teaching grammar is complex owing to the various instructional strategies, methods and approaches[60, 61]. Grammar is defined by Ur[62] as the process of arranging words to form correct sentences, but the definition can be expanded to include key grammatical components and instruction/teaching strategies. R. Ellis[63] does not define grammar explicitly. However, he points out that grammar teaching entails methods that direct students' attention to specific grammatical forms and structures, helping them develop metalinguistic understanding while integrating them into comprehension and production for effective language use. The didactic triangle, a representation of the teaching-learning process, shows learning results from the dynamic interaction and reciprocal effect of three essential elements: the subject matter, the instructor, and the learner[64]. In ELT, the teaching of grammar has long been debated. R. Ellis[65] suggests that the importance and role of grammar knowledge in the L2 scenario is an ongoing debate. According to Rutherford[66], grammar instruction has been the key to teaching foreign languages (FL) under the influence of the Grammar Translation Method (GTM), which was the prominent grammar-teaching method until the 1940s. Cognitive psychology instigated the debate about whether language learning is a conscious process or occurs unconsciously through exposure to input[58]. Krashen[67] contended that language is best acquired naturally. R. Ellis[68] also argued that formal instruction of grammar develops knowledge of rules but does not help in practical usage, as declarative and procedural knowledge operate separately. This led to the belief that if formal grammar teaching is unnecessary for first language (L1) learners, so should it be for L2 learners. Arguments similar to these were put forth with Universal Grammar (UG) in L2 learning[58].

Learning a language without conscious awareness has been considered theoretically flawed[58]. 'Noticing Hypothesis' of Schmidt[69] suggests that conscious attention to language forms is indispensable for language acquisition, as learners must first notice linguistic features in input for effective learning. Many scholars of L2 acquisition[68, 70, 71] concur that 'noticing' target language forms is crucial for learning an L2 because learners tend to focus on meaning over form unless specific forms are consciously noticed in the input[58]. Vygotsky[72] emphasizes the significance of grammar for both linguistic correctness and for promoting cognitive growth in L2 acquisition through social mediation. Hudson[73] noted that grammar instruction is crucial to developing students' competence in both grammar and performance. He further notes that it facilitates FL learning, helps children develop thinking and investigation skills, fosters self-awareness, and promotes a thoughtful approach to language usage. The 'teachability hypothesis' of Piene-

mann[74] contends that while some developmental sequences in L2 learning are set, grammar instruction can help learners progress if it corresponds with their readiness to progress to the next level of proficiency[75]. This idea is well ingrained in communicative language teaching[75, 76]. Much research shows that grammar training positively affects L2 learning, showing notable increases in grammatical correctness and acquisition[68, 77]. As opposed to implicit methods, explicit training, in particular, has demonstrated long-lasting learning advantages[61]. Grammar is the indispensable language framework, enabling sound and lexicon to form a coherent and meaningful communication system[78, 79]. While views on grammar learning vary, complexities in teaching and learning grammar remain.

## 10. Challenges in Grammar Instruction and Learning

Despite acknowledging the importance of grammar instructions, we must recognise grammar teaching and learning challenges. Students lack foundational grammar knowledge, making it difficult for teachers to build on prior learning effectively. Therefore, teachers must reteach basic concepts before introducing new grammar topics[80]. Although students do well in grammar exercises, they fail to apply the language in everyday communication[81]. Language transfer from their mother tongue causes mistakes, while inadequate vocabulary and over-reliance on rote learning prevent a deeper understanding of grammatical concepts[82, 83]. Grammar is perceived by many as daunting and challenging, which results in poor motivation and active engagement[84]. Authentic materials appear excessively complicated because of their sophisticated language and sentence patterns. Furthermore, it is challenging to learn due to the extreme irregularity of English orthography[83, 85].

Teachers struggle with grammar instruction due to inadequate training in grammar pedagogy, over-reliance on age-old teaching methods, and lack of materials on instruction methods and teaching aids along with audiovisual tools[86, 87]. Many continue to ignore more contemporary, participatory alternatives favouring the grammar-translation method. Personalised support to students is hindered by rigid curricula and overcrowded classrooms[86]. Time constraints prevent teachers from engaging in thorough explanations[86, 87]. Additionally, teachers face difficulties adapting engaging and level-appropriate authentic material as it requires additional time and effort. Students' varied learning styles, motivational levels, and attitudes cause teachers to struggle more, leading to poor student retention and engagement[87]. Although teachers accept that teaching grammar has value in improving literacy, they still face significant challenges in deciding what grammatical components to be taught and how they should be taught[88].

Changing needs, attitudes, and misconceptions about the role of grammar among students and teachers hamper grammar instruction and learning[85]. Students face problems with both explicit and implicit grammar teaching methods; a mix of both will not let them feel lost and insecure and will aid them in grasping more complex grammar concepts and their usage in daily communication. These challenges highlight the need for more effective strategies and resources to support both teachers and students in mastering English grammar.

## 11. Methods, Approaches, Techniques and Strategies

The terms methods, approaches and techniques are used interchangeably in ELT and learning (including grammar), but they hold distinct meanings. An approach contains presumptions about language, learning and teaching. Conversely, a method presents language systematically based on a selected approach[89]. Likewise, techniques are activities such as 'trick, strategy, or contrivance' used in the classrooms, which align with methods and approaches; it reflects the application of both approach and method in the classroom[90]. Methods are established with prescribed techniques. Approaches are flexible, they can be adopted in multiple ways during teaching. This creates a 'continuum' from rigid methods to adaptable approaches[91].

Popular approaches to teaching grammar are: 1. Explicit and Implicit 2. Student-centred and Teacher-centred 3. Deductive and Inductive 4. Focus on meaning, form and formS 5. Eclectic Approach. An explicit approach "to teaching grammar insists on the value of the deliberate study of grammar rule in order to recognize linguistic elements efficiently and accurately" on the other hand, an implicit approach "suggests that students should be exposed to grammat-

ical structures in a meaningful and comprehensible context that they may acquire, as naturally as possible, the grammar of the target language"[92, 93]. In the student-centred (or active learning) approach, students actively engage in grammar learning with minimal teacher input, while in the teacher-centred (or passive learning) approach, the teacher takes an active role in grammar teaching while students take a passive role[94]. The inductive grammar teaching approach (bottom-up approach) provides learners with contextual examples without providing the rules explicitly; here, learners deduce grammatical rules, taking responsibility for their learning. In the deductive approach to grammar teaching (top-down approach), the teacher provides the learners with grammatical rules at the beginning of the lesson, explaining how structures are formed and used in a particular context[95]. A focus on meaning approach stresses implicit and incidental language learning without focusing on linguistic forms because language is learnt via usage and exposure. In contrast, the focus-on-forms approach advocates methodical, explicit teaching of grammar, emphasising the acquisition of particular language structures by instructors and students[96, 97]. These are some of the prominent approaches to grammar teaching.

Teaching grammar has experienced various methodological evolutions, with certain methods gaining prominence, declining over time, and reappearing[98]. Thornbury[99] characterizes this as a cyclical phenomenon, highlighting the incessant progress of language teaching methodologies in response to ever-changing theoretical standpoints. The GTM was widely used in 16th-century Latin and Greek and held a prominent place from the 1840s till the 1940s in foreign or L2 teaching, emphasising translation and explicit grammar study as the main activities in L2 learning[100, 101]. The Direct Method focuses on immersive language teaching, emphasizing inductive grammar learning and often neglecting advanced grammar instruction. It gained popularity in the late 19th century and lost its support in the 1930s[102]. Developed in the 1940s and widely accepted in L2 teaching in the 1950s and 1960s, the Audio-Lingual Method (ALM) focused on developing automaticity through 'stimulus-response-reinforcement cycles', introducing grammar implicitly before teaching it explicitly in a concise manner[103]. Situational Language Teaching started in the 1920s and continued till the 1960s in Britain, emphasising grammar teaching implicitly in a natural context, a cousin to the ALM popular in the USA[104]. Communicative Language Teaching (CLT) emerged in the 1970s and stressed teaching grammar inductively through context[105, 106]. Task-based language Teaching (TBLT), a more potent form of CLT, has been evolving since the 1980s, and leverages Cognitive Processing Theory, which emphasises implicit grammar with language exposure, and Socio-cultural Theory, which prioritises social interactions and collaborative activities with teacher-provided scaffolding[107, 108]. These are some of the popular methods used and researched widely. Other methods include Suggestopedia, The Silent Way, Total Physical Response, Community Language Learning, Competency-Based Language Teaching, Cooperative Language Learning, Content-Based Instruction and the like, each contributing to the language teaching methods[101]. There was a 'method boom' in the 1970's[109]. Kumaravadivelu jestingly remarks on not finding a method that starts with the letter Z[109]. He divides the language teaching methods into 1. Language-Centered Methods 2. Learner-Centered Methods, and 3. Learning-Centered Methods. Richards and Rodgers[101] point out that the most common methods and approaches in grammar teaching are structure-based (deductive approach, GTM, ALM). In other methods, grammar is taught mostly implicitly. Most of the methods follow Behaviourist theory (e.g. ALM), Cognitive Theory (e.g. TBLT), and Humanistic Theory (e.g. The Silent Way). Applied linguists, pedagogical experts and practitioners sought a universal method to address the challenges of L2 or FL teaching, but they all failed to find one. This led to the emergence of Postmethod Pedagogy in the 1990s[110]. Postmethod pedagogy highlights flexible classroom-oriented practices that foster learner autonomy[110]. Metacognitive strategy usage helps in attaining learners' autonomy. As there is no ideal method or approach, researchers must conduct further research to assess the effectiveness of a wide range of strategies in grammar teaching[61].

Applied linguist Anthony, in 1963, was the first to differentiate approaches, methods, and techniques in language teaching[111]. In 1982, Richard and Rodger suggested replacing Anthony's terms with approach, design, and procedure to clarify teaching methods and methodology[112]. The third level of Richard's and Rodger's framework, 'procedure', closely aligns with Anthony's 'technique', according to Kumaravadivelu[109]. Cumming[113], therefore, mentions that it

refers to teaching and learning practices, including resources and recommended activities. Techniques in ELT (e.g. Grammar games and grammar drills), are more tangible, practical, and readily implementable, unlike approaches and methods[114]. Techniques align with teaching, while strategies align with learning. Oxford[115] defines strategies as the process of establishing objectives, planning steps to accomplish them and utilising the necessary resources to carry out.

## 12. Language Learning Strategies and Grammar Learning Strategies

Learning strategies are 'specific actions, behaviours, steps or techniques' used by learners for dealing with complicated tasks and to improve one's own learning[116]. Language learning strategies (LLS) have developed from identifying the strategy usage of effective learners in the 1970s to now training the students in need with those strategies; the idea is to make L2 learning or FL learning more self-regulated[116]. LLS research has significantly improved over the past several decades. These advancements pertain to construct conceptualisation, focus on empirical investigations, and the methodologies employed[117]. Researchers ignored Grammar Learning Strategies (GLS) in language learning pedagogy due to 'Zero Grammar Option'. Hence, GLS, among other LLS, was unimportant in the Language Learning situation. Because of neglect from scholars, GLS was called as "Second Cinderella"[118]; therefore, GLS research in empirical inquiries 'remains in its infancy'[119, 120]. Pawlak[121] claims that the "promulgation of non-interventionist approaches" is due to the absence of empirical research in L2 acquisition settings. Palmer[122] states that grammar is a crucial part of all language, and its importance has to be stressed; if it has not garnered the attention it deserves, the problem should be how it is presented or taught. Grammar must be highly prioritised in all language skills. However, the difficult task is, as Larsen-Freeman[123]says, using it precisely, suitably, and meaningfully, and this requires automation of target language (TL) knowledge when used in everyday life[120]. Automation requires metacognitive awareness[124]. To teach or not to teach grammar has been a debate for half a century[125, 126]. The idea of abandoning grammar instruction in the natural language teaching method in accordance with the 'zero grammar option' proposed by Newmark in the 'identity hypothesis' and Krashen in the 'monitor model' has vastly affected the advancement of research in grammar learning and teaching strategies.

Researchers[115, 118, 121, 127–129] have mentioned the scarcity of research in GLS. Inventory or questionnaire usage is widespread in GLS research, but as Pawlak[128] mentions, application research is not widely used. Oxford[130] developed a Strategy Inventory for Language Learning (SILL) to understand grammar learning specifically. Oxford and Lee[118] discuss GLS for implicit and explicit learning of grammar, which would suit instructional design[128]. The studies that use Oxford's[130] inventory try to find English LLS usage among students of various age groups, nations and proficiency[131–133]. The GLS division overlaps with the LLS division. Pawlak[117, 134] has divided GLS into 1. Metacognitive Strategies 2. Affective Strategies 3. Cognitive Strategies 4. Social Strategies. Based on this, he has designed a research tool called the Grammar Learning Strategy Inventory (GLSI)[134, 135]. Studies that have used GLSI unveil the most used strategies, which point out how each phase of cognitive and other behaviours plays out[136, 137]. Even in empirical research, 'Identification and description' is prominent[120]. Additionally, GLS research focuses on EFL Learners, mainly University Students, as samples[120].

GLS usage of mature, cognitively developed students is likely to differ from that of school children[120] from different parts of the world with varying language backgrounds. Studies on the use of GLS among FL learners take the first place, followed by that of L2 English learners[120]. GLS use in third language and multilingualism has just begun[138]. As research in GLS is focused on theory formation, it would be better if it is pedagogically driven to help in learning and using L2 grammar[120]. Since there is barely any study on the Instruction of GLS, there is minimal backing to verify the effectiveness of strategy-based instruction among different demographics and other variables[139]. Cohen and Pinilla-Herrera[140] assert that 'conscious attention' is needed for learning various grammatical forms and strategy usage to retain and perform grammatical forms and language. Teachers influence learners' 'strategic behaviour' in language learning[128], and the right use of GLS helps develop autonomy in learning grammar and L2[141]. As mentioned earlier, metacognitive awareness is required for the automation and

autonomy in language learning. Metacognitive strategies help students reflect and learn [142].

Metacognitive strategies involve planning, monitoring and evaluating language learning, while cognitive strategies focus on analysing or synthesizing linguistic elements. Finally, social/affective strategies emphasize learning through interaction with others [143]. Perkins [144] classifies learners into four levels of metacognitive awareness: tacit learners are ignorant of metacognitive knowledge and use no strategies consciously; aware learners recognise some of their thinking processes but do not plan them; strategic learners are the ones who organize and apply learning strategies efficiently and the reflective learners, monitor and adapt their strategies while learning. Many studies use metacognition in other (LSRW) language learning skills and comprehension studies [143, 145–147]. However, there is a very limited number of studies using metacognition for grammar learning (grammar as the fifth skill, as mentioned by Freeman [123]).

# 13. Previous Publications

Published literature was analysed for trends in metacognitive strategies in grammar learning and grammar teaching. It was collected from major academic databases such as Web of Science and Scopus to ascertain reliability. To ensure that all the publications focused on metacognitive strategies, the following search string was used in both the databases - TITLE-ABS-KEY ( “metacognitive strateg*” AND “grammar” ). The search result generated 33 publications in Scopus and 12 in Web of Science, totalling 45 publications. Among these, 5 duplicates were removed, and 20 were excluded as they did not pertain to English grammar teaching and learning. Additionally, 2 publications were removed - one being a review article and the other a book. These exclusions were made based on a thorough analysis of titles and abstracts to ensure relevance. No other exclusion criteria were added. Finally, 18 articles were selected for the study.

## Country-Wise Publication Distribution

Based on the corresponding author affiliation, it was found that authors from 14 countries conducted studies on metacognitive strategies and grammar learning or teaching. China ranked the highest with the publication number *(n = 3)* each. Most of these studies were conducted in ESL and EFL countries, with only three native English-speaking countries - USA *(n = 2)*, New Zealand *(n = 1)* and Australia *(n = 1)*. Studies on using Metacognitive strategy for grammar learning were predominant in ESL and EFL countries. The following **Table 1** shows the distribution of publications across countries.

**Table 1.** Publications by countries.

| Country | Frequency |
|---|---|
| China | 3 |
| Indonesia | 2 |
| USA | 2 |
| Saudi Arabia | 1 |
| New Zealand | 1 |
| Australia | 1 |
| Ecuador | 1 |
| Iran | 1 |
| Iraq | 1 |
| Slovakia | 1 |
| South Korea | 1 |
| Thailand | 1 |
| UAE | 1 |
| Slovenia | 1 |

The Web of Science indexed research for the search request “metacognitive strateg*” AND “grammar” is presented in this paragraph. According to the findings, many studies are conducted on language learning skills, with grammar as a component. Using pre-test and post-test methods, Robillos [148] conducted mixed methods research with 16 college students to measure the impact of translanguaging during metacognitive strategy use in L2 listening and writing, showing significant improvements. An experimental study using 68 UAE secondary school students finds that metacognitive instruction significantly enhances writing performance [149]. A survey of 50 college students involved in web-based autonomous reading highlights selective attention and note-taking as key strategies [150]. A qualitative study in Indonesia explores EFL students’ argumentative writing challenges; the results discuss the role of grammar and metacognitive strategies [151]. Xu and Bukingham [152] examined ESOL course adoption for older Chinese migrants, emphasising the challenges in shifting grammar lessons online. A survey of 250 Malaysian students examined LLS of STEM students. Findings highlight the frequent use of metacognitive strategies along with others and imply revisiting traditional grammar teaching. Though these studies highlight the effectiveness

and importance of metacognitive strategies, a critical gap remains in experimental studies investigating their impact on grammar learning and teaching. This highlights the need for further empirical research.

The Scopus-indexed research on "metacognitive strateg*" AND "grammar" also reveals a significant gap in experimental research using metacognitive strategies in grammar learning specifically. A study to assess the grammar learning strategy employed by 200 Iraqi EFL learners reveals metacognitive strategy usage is much less[153]. Automated feedback's impact on metacognitive and cognitive strategies was examined, and findings revealed improvements[154]. Lapo and Guanuche[155] examine the role of metacognitive strategies in enhancing grammar competency among A1 learners. The research employed a mixed methods approach. Two randomly selected student groups participated in the study, undergoing pre and post-tests. The results affirm that metacognitive strategies significantly contribute to grammar learning, highlighting their role in enhancing autonomy, cognitive engagement and long-term retention. Furthermore, the study underscores the importance of integrating metacognitive strategy instruction in grammar curricula. Nováková's[156] study concentrates on developing reflective skills, metacognitive strategies and grammar learning. Huang and Zhang[157] examine the process-genre writing instructions influence in metacognitive strategy usage of argumentative writing. Findings conclude that there is a significant shift in metacognitive focus beyond surface-level grammar. Bozorgian, Fallahpour and Muhammadpour[158] conducted experimental research on a homogeneous group of 20 students, randomly assigned as experimental and control groups, examining the impact of L1 (Persian) based metacognitive instruction on English grammar learning. The study assessed four grammar components. The results showed no significant improvement in the experimental group, whereas the attitude measured using a five-point Linkert scale questionnaire towards L1 use in grammar instruction was positive. A mixed methods study examined collaborative writing knowledge on L2 writing performance. Findings highlighted metacognitive strategies as key to better writing outcomes[159]. A correlation study among 280 education students from five Indonesian universities examined individual differences in grammar learning strategies. Findings revealed a correlation between strategies and grammar mastery[160]. Graphic organisers for elementary English writing improved metacognitive awareness and grammar[161]. Research by Phakiti[162] found appraisal confidence weakly linked to calibration. A study by Peklaj and Pečjak[163] found girls used more metacognitive strategies and were intrinsically motivated. Acute lymphoblastic leukaemia survivors did not effectively use story schema as a metacognitive strategy[164]. In a study among five children, aged between 8–10 with dyslexia, grammar-based reading comprehension showed significant improvements. The result also suggested training in metacognitive strategies could improve reading comprehension[165].

Apart from Scopus and Web of Science, the authors searched Google Scholar and found limited intervention studies using metacognitive strategies exclusively for grammar learning. Stephen and Pradheep Singh[166] conducted a metacognitive strategy study for developing English grammar among 50 undergraduate first-year students in the field of commerce. They supposed that engaging students in a metacognitive thought process would help them improve their learning. A master's research on metacognitive strategy usage for grammar learning by Badway[167] examined how metacognitive strategies affected the grammatical proficiency of 66 engineering students in their preparatory year, an experimental group (n = 31) and a control group (n = 35). Grammar structures from a technical English syllabus were examined in both groups. While the control group was taught just cognitive strategies, the experimental group was trained in metacognitive strategies (thinking aloud, metacognitive scaffolding, and self-questioning) and cognitive tactics (inductive and deductive). The experimental group fared much better on the grammatical accomplishment exam than the control group, according to a t-test analysis. Furthermore, a metacognitive strategy questionnaire revealed that the experimental group used metacognitive techniques more effectively. A systematic review of the Indian doctoral thesis in metacognition suggests a dearth of empirical research in metacognitive grammar teaching in India[168]. Gimeno's[169] research aimed to design an instructional model to help students learn grammar autonomously with both cognitive and metacognitive strategy acquisition. She used selective attention, self-evaluation and self-monitoring strategies from metacognition. Sixty secondary students from Valencia participated in the study. The samples were divided equally

into control and experimental groups. The experimental research contained a pre and post-test. Findings confirmed that the strategies helped students acquire grammar. A study by Fard[170] examines the impact of metacognitive and cognitive strategy instruction on grammar learning, with a main focus on structural development. Sixty-six participants were selected through cluster sampling. Instructions were given over a period of 10 sessions. Findings revealed significant development in structural knowledge using metacognitive strategies.

The comparative analysis of empirical research in intervention studies shows that many researchers adopted experimental design[166, 167, 169], while one study used mixed methods research[155] and a study by Fard uses a quasi-experimental research design[170]. Sample sizes ranged from 20 to 66[155, 166, 167, 167, 169]. All empirical studies mentioned use pre-test and post-test design to test the effectiveness of metacognitive strategy intervention[155, 166, 167, 169, 170].Three of these studies used university students as samples[166, 167, 170] while one study focused on secondary school students[169] and another examined CEFR A1 level learners[155]. Four researchers employed the random sampling method[166, 167, 169, 169] and one study utilised matched randomisation based on pre-test scores.

Pawlak and Oxford[171] and Trendak[172] suggest the need for more empirical investigations using interventionist methods of various strategies as divided by Pawlak[117, 134]. We observed that empirical research conducted using metacognitive strategies in grammar learning was insignificant. In-depth studies on Metacognitive strategies in grammar learning would help us know the efficacy of metacognitive strategies among various age groups and linguistic proficiency levels (as categorised in CEFR) and learners of different needs (ESP, EGP, IELTS and others). There is significant scope for research in multiple dimensions, such as topical, methodological, contextual, institutional, procedural and various metacognitive strategy-based research directions. The existing literature suggests a need for research on the above-mentioned fields, emphasising the need for further exploration. While metacognitive strategy intervention studies have mentioned grammar within the larger context of LSRW skills, only limited studies have focused exclusively on grammar teaching and learning employing metacognitive strategies. Future research holds promise for exploring the application of metacognitive strategies on specific grammar components. Among the few studies that use metacognitive strategies for grammar teaching/learning, most of them use a quantitative approach, overlooking qualitative and mixed methods. Even in the quantitative method, cross-sectional and longitudinal research are hardly explored. Qualitative research methods such as case studies, ethnographic studies, and action research have barely been investigated. There is also a dearth of studies with large sample sizes.

Existing literature on metacognitive strategies in grammar learning is largely limited to ESL and EFL contexts. Studies using metacognitive strategies for grammar advancement could be explored in L1 situations. Research on metacognitive strategy usage in grammar learning among kindergarten, primary, middle, and postgraduate levels is scarce. Additionally, multilingual classrooms are underexplored. ESP, EGP, IELTS and other special needs classrooms could be investigated for metacognitive strategy usage and its impact on grammar learning. The same educational settings with different backgrounds (rural and urban) could also be explored. Various institution types, such as government, private, and semi-private, could be explored to determine possible differences in results among those students employing metacognitive strategies for grammar learning. In the procedural context, various sampling techniques, such as quota, snowball, and consecutive sampling, are negligible in metacognitive intervention. Therefore, we suggest using various research methods, research designs, research methodologies, samples, data collecting sources, statistical methods, sampling techniques and higher sample sizes to generalise metacognitive strategy usage in grammar teaching and learning classrooms across L1, ESL, EFL and other contexts. There is an inventory for identifying metacognitive awareness Schraw and Dennison[28], but no exclusive metacognitive strategy awareness inventory exists for grammar learning. Even GLSI by Pawlak is used for all the grammar learning strategies. A new inventory on metacognitive strategies for grammar learning would assist us with the knowledge of strategies where students excel and otherwise. This would also provide insights into metacognitive strategy used by a wide range of learners (L1, ESL, EFL, ESP, EGP, IELTS and others) across geographical locations. Aside from this, a comprehensive note of all the metacognitive strategies, despite their usage or non-usage in grammar teaching, would

help academicians and researchers explore their use better. This would further enhance the research in grammar and language teaching and learning.

## 14. Conclusions

Grammar is an effective tool that enables language users to select from various options to effectively convey their intended meaning and achieve their communicative goals in specific contexts. It plays a fundamental role in language acquisition/learning. Deliberate focus is needed to learn various grammatical forms and use strategies to retain and perform grammatical forms and language. This study emphasises the importance of incorporating metacognitive strategies for grammar learning by pointing out that metacognition promotes autonomy and long-term retention of grammatical structures and forms. Also, metacognitive awareness helps the learners to become reflective and use strategies wisely. Previous literature has mainly focused on metacognitive strategy usage in LSRW skills. Therefore, a significant research gap remains in applying metacognitive strategy intervention across different learner demographics, language proficiency levels and educational settings. A better understanding of metacognitive strategies in grammar learning would develop innovative pedagogical approaches that combine explicit and implicit approaches with learner-centred strategies. These strategies could encourage learners to become independent and apply grammar knowledge efficiently across contexts. Finally, incorporating metacognitive strategies into grammar instruction can bridge the gap between theoretical understanding and practical use. Teachers influence the 'strategic behaviour' of learners in grammar learning. Therefore, educators and teachers should consider adapting their teaching methodologies to include metacognitive strategy instruction. Using metacognitive strategies, besides other theoretical approaches and methods, motivates the learner to gain autonomy in learning, which aligns with the skill-learning theory.

## Author Contributions

N.P. contributed to conceptualising and developing central ideas, literature synthesis, manuscript drafting, and theoretical analysis, while S.R. provided supervision, validated concepts, offered critical feedback, and refined the manuscript for intellectual rigour. All authors have read and agreed to the published version of the manuscript.

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## Conflicts of Interest

The authors declare no conflict of interest or competing interests.

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