

Language, Cognition, and Teaching

A Thesis

submitted to Indian Institute of Science Education and Research Pune in partial
fulfilment of the requirements for the BS-MS Dual Degree Programme

By

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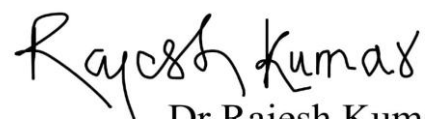
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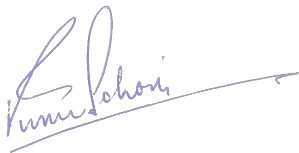
Certificate

This is to certify that this dissertation entitled Language, Cognition, and Teaching towards the partial fulfilment of the BS-MS dual degree programme at the Indian Institute of Science Education and Research, Pune represents study/work carried out by Avani P at Indian Institute of Technology, Madras, under the supervision of Dr Rajesh Kumar, Professor and Head, Department of Humanities and Social Sciences, English Studies and Linguistics, during the academic year 2024-2025.


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This thesis is dedicated to my family, who supports me through my ups and downs.

Declaration

I hereby declare that the matter embodied in the report entitled Language, Cognition, and Teaching are the results of the work carried out by me at the Department of Humanities and Social Sciences, English Studies and Linguistics, Indian Institute of Technology, Madras, under the supervision of Dr Rajesh Kumar and the same has not been submitted elsewhere for any other degree.

A handwritten signature in black ink, appearing to read 'Avani P', is written over several horizontal lines.

Avani P

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Abstract

The present thesis investigates the relationship between language, cognition, and teaching in the context of learning English as a second language (ESL) in a multilingual setup like India. The study was conducted among the 9th-grade students in Kerala, India, mainly due to their age and development. Using a mixed-method approach, 89 students across two schools (semi-urban and semi-rural) were asked to fill out the structured questionnaire, which assessed their reading comprehension, verbal reasoning, grammar knowledge, and self-reported challenges in a Likert scale format. The data analysis revealed the challenges in remembering grammar rules, vocabulary knowledge, and comprehension of fast-spoken English, where memory played an important role. Also, socio-cultural-economic and environmental factors all play an essential role in overall proficiency. This and previous studies advocated for a change from the traditional teaching practices, making the classrooms more interactive and moving from a teacher-centered to a student-centric pedagogical approach. CLT and memory-enhancing activities can be employed in the classrooms. Additionally, the study stresses the impact of environmental factors, which is shown in the data where the semiurban school outperforms its corresponding semi-rural space. This research contributes to the ongoing discussion and studies on ESL learning, especially in a multilingual setup like India. The study can provide recommendations to researchers, educators, and policymakers to improve the efficiency of English language teaching and learning in India.

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Chapter 1

Introduction

Background Information

English is considered a global language. English is spoken and is used for communication in all fields. It is also used as a first, second, or foreign language. English is very much needed today because it is used in varied contexts and helps improve communication comprehension. It also elevates the chances in job, educational, and business fields. The English language connects different worlds, which are socially, culturally, economically, and linguistically diverse. Since the colonial era, English has been taught as a second language in India. Despite being a multilingual nation in India, English has been accepted by many and has gained the title of acting as a bridge between the different states in India, which was divided along linguistic and language identity. The English language has acquired the title of language of power and prestige.

Language acquisition has been considered a cognitive process that also depends on factors like memory, cognitive development, and other socio-cultural-economic factors. India has a multilingual setup. English is being taught as a subject from a very young age. However, debates are going on whether starting to study English as a second language (ESL) early will help to achieve native-like proficiency. The research was conducted among 89 students from two Kerala schools with a higher literacy rate in India, contributing to the further research happening in SLA.

Even though all of the students studied in English medium classes, some students may feel dissimilar due to various factors like changes in exposure or environment, teaching methods and techniques, and varied cognitive skills of students.

This study examines and explores the cognitive and pedagogical factors affecting second language acquisition (SLA), particularly learning English as a second language (ESL). In India, the syllabus is based on a three-language format. Since more importance is given to the target language, the students, particularly young ones, may feel a burden to maintain proficiency in their mother tongue. This cognitive overload may cause trouble remembering vocabulary, grammar rules, syntax, and problems with fluency and proficiency. Sociocultural-economic inequality may create a disparity between different groups rather than act as a unifier. This disparity is more evident in urban English medium schools and rural vernacular medium schools. So, studying the cognitive mechanisms and pedagogical approaches to learning English as a second language in India is necessary. Memory, attention, problem-solving skills, and motivation also play a crucial role in acquiring, processing, retaining, remembering, and recalling linguistic information. However, limited studies have been conducted to find the relation between cognitive processes and learning English as a second language in a multilingual setup. This thesis tries to bridge the gap between language learning, cognition, and teaching by focusing on cognitive skills, memory, and the influence of the first language (L1).

Context and Significance of the Research Questions

The study of language acquisition has gained much popularity in today's world. Particularly learning English as a second language. So, understanding the cognitive processes and development is very important in language acquisition research. Memory plays a vital role in learning, processing, remembering, and recalling vocabulary and grammar rules, which will help improve communication and overall English proficiency and efficiency. Cognitive development plays a role in language development. In different ways, refining and adequately training the cognitive skills and pedagogical approach from a very young age can help to improve the overall proficiency like that of a native speaker of English. Learning English as a second language helps to communicate to a broader audience or people and helps to learn many things, including a new language, the literature in the target language; it also helps in learning about a different culture and a new social life, which is different from the previous ones. ESL learning also helps in developing a refined psych-social development. These factors increase the quality of life and help impersonal and social development. ESL learning helps to create personal development by helping people get jobs and educational opportunities, which will make the person financially, socially, and economically sound and secure. Indirectly, ESL learning helps achieve equality at both individual and community levels.

Focus on the Thesis Questions

The central question of this study delves into the interplay between language, cognition, and teaching. The research questions are:

1. Is there a relation between memory and language acquisition?

2. Is there a connection between cognitive development and learning English as a second language?

3. What are the possible factors that contribute to or obstruct language acquisition?

This study focuses on how cognitive skills like memory and cognitive development help to improve cognitive skills, which in turn helps acquire a second language in a multilingual setup like that of India. By focusing on these aspects, this study also tries to find the cognitive and environmental barriers the learners may face while learning English as a second language and how the troubles can be mitigated.

Scope of the Work

This study focuses on the 9th-standard students from two schools in Kerala, India. This study is confined to the Indian context or environment like this. The study has used a mixed-method approach, including quantitative data from the data collected and qualitative work based on a literature review. This study examines the relationship between memory, cognitive development, and skills in learning English as a second language. Also, it explores the different pedagogical methods and environmental factors that help in learning ESL.

The locations of the two schools are in Kottayam district of Kerala, where the students learn three languages, namely Malayalam, English, and Hindi, simultaneously from a very young age. The school is located in a semi-urban and semi-rural environment. The difference in location is helpful as it will help in a comparative study based on locations and draw information on the learning outcomes of the students in the two schools. The 9th-graders were chosen because of their

transitioning period. They are neither children nor adults. This is a period of varied cognitive and linguistic development.

However, the study was conducted in only two schools in one district and may not accurately depict the diverse ESL learners across India. Also, since only the 9th-standard students are included in the study, the data cannot be extrapolated to a different age group. The study lacks longitudinal data, which could give a more profound understanding of their proficiency over time.

This study can be used to develop new policies and education reforms that will help acquire English as a second language.

Goals of the Project

The main goal of this study is to find the interplay between language, cognition, and teaching, mainly focusing on learning English as a second language in a multilingual setup. Specific objectives include identifying the cognitive factors, like memory, that help or hinder second language acquisition by assessing the importance of memory and mental development in SLA. This research helps provide new recommendations for improving the teaching and pedagogical approach. The study can help educators, researchers, and policymakers develop new and varied insights to help improve English language teaching and learning in different environments like a multilingual setup. These findings can be used in academic contributions, practical implications, Or new approach with a long-term impact.

Chapter 2

Literature Review

The relationship between memory and language acquisition and the connection between cognition and learning English as a second language (ESL) has been studied significantly in cognitive science, linguistics, and education. Through this literature review, the research on the cognitive mechanisms underlying language learning and factors that facilitate or hinder second language acquisition (SLA) are discussed.

This literature review focuses mainly on the following points:

1. The role of memory systems in language acquisition.
2. The relationship between cognitive development and second language acquisition (SLA).
3. The factors contribute to or obstruct learning English as a second language.
4. Identifying the research gaps in the existing studies

This literature review tries to draw conclusions based on linguistic relativity theory, cognitive theory, multilingual pedagogy, particularly in the case of India, and second language acquisition (SLA).

2.1 Theoretical Foundations for Memory and Language Acquisition

2.1.1 The Sapir-Whorf Hypothesis and Linguistic Relativity

The Sapir-Whorf Hypothesis, which was first proposed by Edward Sapir in the year 1929 and further developed by his student Benjamin Lee Whorf, states that “the structure of a language determines a native speaker’s perception and categorisation of experiences.” There are two significant theories, namely, linguistic determination and linguistic influence. Even though both theories explore how language impacts thought and perception, there is a slight difference between the two. Linguistic determinism, the stronger of the two theories, states that language determines thought. The weaker one, linguistic influence, suggests language shapes thought but does not control it.

The Sapir-Whorf Hypothesis, mainly in “The Relation of Habitual Thought and Behaviour to Language” by Whorf (1956), states that language influences cognitive processes. This paper explains how our language shapes habitual thought patterns and behaviours. Whorf also argues that language influences our perception of reality and mental processes. He also examined how different linguistic structures and vocabularies can lead to other ways of thinking and acting. For example,

he adds that speakers of a particular language with multiple terms for certain concepts will be able to understand those concepts more distinctly than speakers of a language with a single term for the same concepts. One of the examples he gives is the Hopi Language and the conceptualisation of time. There is no clear distinction in the Hopi Language in words representing past, present and future. They only have words to convey what has already happened and happening and a word to denote the things that are going to happen. These Hopi Language users perceive time differently than an English Language speaker.

This theory is further explored and expanded in “The History of Thought about Language and Thought” by Elffers (1996). Through this paper, the author has explored the evolution of ideas about the relationship between language and cognition throughout history. It also examines how different thinkers throughout history have conceptualised the relationship between linguistic expression and mental processes by explaining the changes in philosophical and psychological perspectives. Elffers discusses the viewpoints of ancient philosophers like Plato and Aristotle to modern theories. The paper covers the debate about linguistic relativity, whether thought precedes and influences language and the impact of significant movements and scientific discoveries on our understanding of this relationship.

2.1.2 Memory Systems and First Language Acquisition

Memory plays a crucial role in the acquisition of a first language. Theories of language development suggest various memory systems, like working memory and long-term memory, which contribute

to language learning in a child's life. Infants mainly rely on implicit learning strategies to acquire their first language. They learn the grammatical rules and vocabulary without explicit teaching. Cognitive mechanisms like categorisation and pattern identification help people develop a first language. This section explores the relationship between memory and L1 acquisition.

Clark (2009) focuses on the process of children acquiring the first language (L1) and answers one of the most debated questions: "Does the language one uses affect the way they think?"

First language (L1) acquisition is dependent on many factors. One of the essential aspects, and the first one, is the "social dimension." The child starts learning from the adults speaking around them. Conversations with adults will help the child adapt to their first language and subsequent acquisition. Children start talking in their first language through various stages and finally acquire native proficiency. These stages include;

1. Babbling: Children typically begin babbling around 6 months of age and try to communicate with non-coherent sounds like "ba ba ba."
2. Jargon Phase: They try to communicate using so much jargon in this phase but are often unrecognisable.

3. Holophrastic Stage: This stage ranges from 9 to 18 months. The child may say a word to describe the objects or their needs.

4. Imitations: The child learns to mimic verbal language, which will help them to understand how words relate to actions or behaviours. This will allow them to associate tasks with words.

Children approach the challenge of acquiring a language with predetermined perceptual mechanisms and with finite attention and memory capacities. To answer how children form conceptual categories in the first place, according to Oakes Plumert, Lansink and Merryman (1996), as children become familiar with the objects in a task, they can change their categorisations, whether children form a category that includes or excludes specific exemplars they are exposed to.

Children learn through their prior experiences and the recurring of these experiences (Clark, 2009).

Then comes an important question: How could children learn and grasp the complex laws that control verbal expressions and understanding in their language if they were only exposed to the language spoken around them? To answer this, there is something in the brain that helps this. Noam Chomsky called this the 'language organ'. It is an inherent mental module or a faculty dedicated to the task of learning a language. Chomsky's argues that this language organ or faculty contains innate knowledge of many linguistic rules and principles: this creates the language faculty's 'initial state'. The exposure to the outside world, which Chomsky called primary linguistic data (PLD), will give rise to a new body of linguistic knowledge. One's linguistic competence, which includes the

grammar of that specific language, is constituted by this accomplished, or final, condition of language faculty. This brings us to the nativist view, which states that a large portion of our linguistic knowledge is inborn, innate or unlearned. The article “Innateness and Language,” published in the Stanford Encyclopaedia of Philosophy, explains this view in detail.

The article named “Innateness and Language”, mentioned above, provides a detailed overview of the debate between Chomsky’s and Skinner’s case. B F Skinner, a renowned behavioural psychologist argued that human linguistic behaviour (our utterances and our response to the utterances of others) is determined by two factors.

1. The environment’s current features and,
2. The reinforcement history of the speaker (rewards and penalties given or not given according to the prior language behaviours).

Skinner also asserted that ‘knowing’ a language is just a matter of possessing specific behavioural traits. Chomsky, on the other hand, claimed that language competence is more than just a set of behavioural traits. Instead, mastery of a language requires a richness of pragmatic, semantic and syntactic knowledge. According to Chomsky, how we respond to a given circumstance results from a complicated interaction between our past, beliefs, desires, and understanding of how our language works. Later, Chomsky called the last one cognisance. Chomsky stated that “it is simply not true that children learn language only through the meticulous care of adults who shape their verbal repertoire through careful differential reinforcement.”

According to Chomsky, the language is;

1. Stimulus independent: Depending on one's mental state, almost any words can be said in reaction to an environmental stimulus.
2. Historically unbound: It is evident that we can say untrained things, so, our history of reinforcement does not define what we say.

There has been a continuing discussion about nurture versus nature, innateness versus learning and social versus cognitive. The author of the book First Language Acquisition, Clark (2009), says that effective language learning involves social and cognitive aspects. Infants are born into social settings as social beings. So, through interaction, infants can communicate with adults and tell their needs and wants. This highlights the importance of a social setting. Clark (2009), in his book, asks many related questions, such as:

1. If the language addressed to the children is tailored according to the child's skills, is this tailoring necessary for the child to learn a first language?
2. Could a child acquire the first language by overhearing others or through media?
3. Is there a need for interactive sections for acquiring a first language?
4. What is the sufficient versus necessary exposure for acquiring a first language?

5. Do children need feedback after producing a wrong sentence?
6. What degree of modifications are needed for an adult to participate in a conversation with less-skilled language users?

Many of these questions are still developing a finite answer. In the book *Language Development: Individual Differences in Social Context*, Law, Reilly and McKean (2017) have included a chapter named *Language and Cognition* by Sabine Weinert. This chapter also explores the relationship between language and cognitive development in children, whether they are two independent areas or if they influence each other. The chapter explains that children may show proficiency in one area while they delay learning different regions. Cognitive development, information processing in the brain, and learning abilities impact language acquisition. It emphasises the nativist view, which states that language-specific aspects must be learned. For this process to happen, it has to rely on cognitive and social abilities.

On the other hand, this particular chapter also discusses the importance of verbal input and communication in language acquisition. Babies are born into a verbal environment where the central aspect of earning attention, communicating and transferring knowledge is via language. This exposure to language plays a crucial role in shaping cognitive functions. Several hypotheses on the connection between language and cognition are also explained in this chapter. They are cognitive determinism, language determinism, global interdependence, and independence. The article also says multiple dynamic interrelations exist between language and cognition, and these relations change over time. In this chapter, there are also discussions regarding language development and

perception, learning abilities and others. While examining the connections between memory and language development, it says that memory strategies are often verbal.

Another book, “Language Development” by Erika Hoff (2020), provides an overall view of how humans can acquire and develop a language. The author incorporated studies and results from linguistics, psychology, and cognitive sciences. This book covers many key topics in the related fields and emphasises the role of biological, cognitive and social factors in language acquisition. Hoff also examines the role of various factors such as individual differences, the effects of bilingualism and multilingualism, the influence of parentese, socioeconomic status and cultural identities. Hoff also outlines the different aspects of language acquisition.

2.1.3 Second Language Acquisition (SLA) and Cognitive Development

Second language acquisition is a complex process which is connected to cognitive development. Cognitive functions like memory, attention, problem-solving, and others depend on how an individual acquires, processes, and finally gets expertise in a second language. The studies show two ways to study a second language: implicit and explicit. When younger learners of L2 rely on implicit mechanisms and pattern recognition, the older learners try explicit learning and previous linguistic awareness. However, the brain’s plasticity can change, affecting how languages are learned at different ages.

Second language acquisition (SLA) is how people learn a second language other than their native one. The different stages of SLA are:

1. Pre-production: This is the stage in which the learner is absorbing the language and has not yet started talking in that language.
2. Early-Production: Starts using simple phrases and sentences.
3. Speech Emergence: Starts to produce complex sentences and join basic conversations.
4. Intermediate fluency: Can produce complex conversations and express their idea more clearly.
5. Advanced fluency: Can talk like a native speaker.

Some of the factors affecting SLA are:

1. Age: While younger learners are pretty good with pronunciation and grammar, older learners have better cognitive strategies and motivation.
2. Motivation: The integrative (desire to integrate with the culture) and instrumental (practical benefits) motivations will impact the SLA.
3. Exposure: Regular and meaningful exposure to the language will help to acquire the second language faster.

4. Learning environment: Joining an environment where the language is used heavily will help to acquire the second language faster.

Practising, interacting, and contextual learning are some of the strategies for easy second language acquisition. The challenges in SLA are:

1. Interlanguage: The evolving state of a learner's language proficiency may contain elements from native and target languages.
2. Fossilisation: The problem by which particular errors can get ingrained and are hard to correct.
3. Language transfer: Applying the rules and patterns from the native language will cause errors.

In his book "Second Language Acquisition and Second Language Learning," Stephen D Krashen (1981), one of the foundational books in applied linguistics, delves into how people acquire second languages and the major theories. Krashen, in his book, makes a distinction between acquisition and learning. He says that acquisition is an unconscious process that is also natural and happens during conversations and interactions, where importance is given to understanding and successful communication rather than focusing more on form and structure. On the other hand, learning is a conscious process where grammatical rules and patterns are taught in a formal setup. As quoted by Krashen, fluency in a second language comes through acquisition and not learning.

His natural order hypothesis states that specific language structures are acquired earlier than others, and teaching grammar rules will not change this natural order. His monitor hypothesis explains the role of learned language in language usage. The monitor is a cognitive mechanism learners use to correct conversations when they know a rule. Even though it helps with accuracy, the overuse of a monitor can hinder fluency. Another idea the author uses is the input hypothesis. This states that language acquisition occurs when learners receive slightly more comprehensible input than their current level. If the input is too straightforward, the learner gets nothing, and no progress will be made. This shows that meaningful communication rather than explicit grammatical inputs helps acquire and progress language usage.

Also, Krashen suggests various emotional and psychological factors influencing language acquisition. He explains multiple environments for better language acquisition. Krashen also applies his theories to different contexts, challenging the notion that adults cannot acquire a language as effectively as children and critiquing the traditional grammar-based teaching methods in classrooms.

In Krashen's other book, *Principles and Practice in Second Language Acquisition* (1982), he delves into how second languages are acquired. He emphasises input and affective factors and subconscious acquisition over explicit acquisition. In this book, he prioritises meaning over form, encouraging participation in natural communication and minimising explicit grammar rules, teachings in comprehensible inputs, and others.

2.1.4 Role of Age in SLA

The role of age and second language acquisition is a widely debated topic. It influences factors like memory retention and cognitive ability. Research suggests that younger learners are likelier to develop native-like proficiency in pronunciation and implicit grammar rules. Older learners are more likely to rely on explicit learning methods. Research has shown that this also depends on working and long-term memory. This section explores the interaction between age, memory and second language acquisition (SLA).

The critical period hypothesis is “the limited phase in the development of an organism during which a particular activity or competency must be acquired if it is to be incorporated into the behaviour of that organism” (Yang, 2019).

Yang (2019), in the paper “The Age Factors on Second Language Acquisition and Its Implications for Pedagogy-a review and future research directions,” examines the role of age in second language acquisition (SLA) in the existing works. The paper explores the critical period hypothesis (CPH). Yang says in the paper that younger learners are likelier to achieve native-like proficiency while learning a second language than older learners. Yang notices that the critical period hypothesis (CPH) pattern applies to grammar and pronunciation, whereas vocabulary and reading skills can be acquired at any age. While children rely more on the implicit mode of learning through experiences and exposure, adults, on the other hand, have better analytical skills, which they explicitly acquired, but may struggle with a foreign accent and fluency. This paper reviews multiple studies that compare early and late second language learners and tries to conclude that

early exposure to a second language may help in pronunciation and fluency, and older learners may still have foreign accents. It also gives some suggestions for pedagogy. She suggests different curriculum plans for second language learners of various ages, focusing on their main difficulties.

Xu (2023) focuses on the effect of age on second language acquisition in the paper “The Age Effect in Second Language Acquisition and Its Study Design Method.” This paper defines the critical period hypothesis in linguistics as the Critical Period (CP), which refers to a remarkable period of life development in which learning occurs easily and rapidly without external intervention and direction (Xu, 2023). Various studies have found that the critical period is between two ages and puberty. While some studies support the CPH in second language learning, some literature is against this hypothesis. The paper supports the CPH by stating that as the brain loses elasticity gradually, it becomes difficult for children to catch up with the language input.

In Dzukhriyah, Adisti (2023), in addition to the discussions on age, SLA, and CPH, this paper also discusses other cognitive, social and educational factors that affect language learning. Another paper by Ozfidan and Burlbaw, as quoted in this paper, says that the foundation of CPH is all in the brain’s structure. The authors say puberty is when the brain’s left hemisphere processes language and is connected to biological development. This time is called lateralisation. This also says that children’s brains are more malleable in language acquisition than adults—specifically the cortex (Dzukhriyah, Adisti, 2023). The paper then gives multiple examples from the existing literature in favour and against the concept of CPH. The cognitive factors like memory capacity, attention, problem-solving skills, motivation and attitude also determine the process of second language acquisition. It is said that younger learners may study the second language naturally but may not

have long-term motivation. In contrast, older learners are goal-oriented and may struggle with anxiety and lack of confidence. They conclude the paper by saying that age is a determining factor, but its effects are complex and context-dependent.

Deng and Wang (2019) discuss the topic of how the starting age affects the second language acquisition and its efficiency and proficiency. Through this paper, the authors analyse the learners' characteristics and conditions across three populations: young children, adolescents, and adults.

The paper concludes by stating that while age affects second language acquisition, it is not always true that starting early guarantees complete success, and many other factors affect successful language acquisition. They also find that pronunciation is most affected by the factor of age, and grammar and vocabulary can be learned at any stage.

Dong and Ren (2013) discuss the effect of age on second language acquisition through a psychological lens and explain how younger learners outperform older learners. They also explained the various theories and experiments that had been done before. Lenneberg's Critical

Period Hypothesis (CPH) 1967, Johnson and Newport's Exercise Hypothesis versus Maturational State Hypothesis 1989, Felix's Competition model, Bley-Vroman's fundamental difference Hypothesis and other studies on the evidence for effects of age in phonology, morphology and syntax are all included in this paper.

In the paper "Effects of Age on Second Language Acquisition", Tohidian and Tohidian (2009), the authors examine the impact of age on SLA. The paper mainly focuses on how age affects the language learning process and its ultimate proficiency and efficiency. The paper also evaluates the

Critical Period Hypothesis (CPH). According to this paper, age significantly affects pronunciation, grammar and cognitive processes. They quote the definition of CPH by Lenneberg (1967). It majorly explores four questions:

1. The effects of age on SLA
2. Influence of age on rate of learning
3. The long-term effects of starting age on SLA
4. Adults and natives like proficiency in SLA.

According to the authors and many studies, children and adults follow the same pattern in language acquisition, and according to research on the comparison between early and late language learners, it was found that they both showed similar patterns in errors and acquisition, which suggests that age may not fundamentally affect the language acquisition process. Also, they found that age has minimal impacts on syntax and morphology. These results are aligning with the results of Deng Wang (2019) and Dong Ren (2013).

The relationship between age and second language acquisition continues to be widely debated in many fields. In the current scenario, some studies try to identify the neurological and cognitive mechanisms that may affect the effects of age on SLA, and there has been the development of different pedagogical approaches for various groups of people studying a second language. The research has taken a different path from asking if there is a critical period to factors influencing

SLA and age effects.

2.2 Cognition and Learning Barriers in English Second Language (ESL) Acquisition

2.2.1 Factors Influencing Second Language Acquisition In A Multilingual Context

A variety of internal and external factors influence the process of second language acquisition. These are mainly shaped and refined by cognition, aspects of sociolinguistics, and pedagogical factors. Understanding the influences of these factors is very important for developing new teaching methods and learning techniques. This section covers the existing research on educational policies, linguistic environments and instructional frameworks which will impact language learning.

Petrovic and Majumdar (2010) identify the interface between language policy, planning, and equal educational opportunity (EEO). This particular study uses India as an example of a complex multilingual environment. The authors argue that language policies must facilitate multilingual education to ensure EEO, particularly for linguistic minorities. The study also discusses the ThreeLanguage Formula established in India and the challenges of implementing a language policy that will promote equality. Equal Educational Opportunity (EEO) is not just about access but also about the learning conditions, equity in the curriculum and language inclusion. The followers of traditional EEO gave more importance to formal access, suggesting that every student will succeed if they all attend the same school and follow the same curricula.

On the other hand, followers of actualist EEO argue that schools must address the language barriers to provide learning opportunities. As Vygotsky says, language is crucial in an individual's cognitive and social development. Suppose the teacher uses the students' mother tongue as the medium of instruction. In that case, the students can comprehend the ideas more efficiently and engage more in the classroom. If one ignores the linguistic diversity in the classrooms, it will cause a disadvantage to the language minority students. Even though around 415 languages in India are still in use, only 22 scheduled languages have the privileges of an official language. Many linguistic minorities lack formal recognition, which may lead to social and educational disadvantages.

India is multilingual, and the three-language formula has been used since 1956. It promotes the regional language, Hindi, as a language that ensures national unity and the English language for global communications. The significant challenges this paper puts forward are the priority given to the English language over the regional language, the political controversies for using the Hindi language, and the limited resources, such as the lack of teachers in schools who can communicate in minority languages. The politics of language in India have failed the three-language formula in practice. Additional approaches to language planning are needed and must also be flexible.

Mohanty (2017), in his paper, examines the relationship between language, education, and socioeconomic development in multilingual contexts like India, particularly the relationship between the

English language and development in India. With the help of Amartya Sen's capability deprivations, Mohanty explains how language inequality affects education, job opportunities and social life. The paper mainly sheds light on how the English language creates and changes social hierarchies, the

role of education, and different multilingual modes for equitable development. Even though the global language, English proficiency, causes economic growth, it only happens in certain groups.

He argues that English restricts access to opportunities for marginalised communities. In India, English has slowly taken hold of dominance over the educational and employment sectors.

According to Sen (2001), as quoted by Mohanty, Development is not simply economic growth but includes freedom, equality and social justice. The influence of the English language has caused a double divide in the Indian educational system. The two beings:

1. The English-vernacular divide: English medium schools are the elite schools, and the regional language schools will receive fewer resources and better infrastructure and opportunities for the elite schools.
2. The Vernacular-tribal divide: Indigenous tribal minority (ITM) children will not be able to study in their mother tongue. Because tribal languages are not recognised in the educational field, many dropouts are experienced.

A comparison showed that English medium students are not performing better than mother tongue medium students. This helped to identify the myth of the superiority of English medium schools. Mohanty also includes some alternative models for language policy in India, like early education in the mother tongue and mother-tongue-based multilingual education and the inclusion of the English language in later classes.

Agnihotri (2007), in the paper titled “Towards a Pedagogical Paradigm Rooted in Multilinguality,” challenges language learning in a traditional way and promotes multilingualism. This paper also critiques the monolingual educational paradigms and proposes a pedagogical shift towards a multilingual educational approach. This paper argues that languages are distinct, are colonial impositions, and, in reality, are interconnected. In schools, usually, there is a hierarchy given to the languages, which often leads to the discrimination and exclusion of marginalised communities.

The priority given to the English language in classrooms will cause the overdominance of the English language over the others, eventually leading to the marginalisation of local and indigenous languages and causing social inequalities. Agnihotri (2007) proposes some pedagogical approaches to overcome these issues, such as using multilingualism as a resource rather than a problem, encouraging code-switching and assessing students based on context-specific assessments that reflect the student’s linguistic abilities.

Agnihotri (2014, in the paper “Multilinguality, Education and Harmony,” focuses on his previous arguments for using multilinguality as a tool for harmony and equality. He says that monolingual education may cause the emergence of social hierarchies and limit children’s cognitive development. Multilingualism is an innate human ability and is the linguistic state of many states, particularly in India. The one-language policy and its implications in schools might cause the exclusion of non-dominant language speakers’ ability to quality education and equality. He suggests understanding the importance and value of indigenous languages and training teachers in multiple languages and pedagogical methods. Most importantly, a bilingual or multilingual curriculum should be included in classrooms.

Even though the two papers by Agnihotri say the importance of a pedagogical shift from monolingual to multilingual educational curricula, they differ in the focus. Agnihotri (2007) critiques the current traditional educational models; Agnihotri (2014) emphasises the social equality and harmony that can happen due to a multilingual pedagogical approach that supports them. While the first paper is theoretical, the second is practical, emphasising policy changes and pedagogical strategies. Agnihotri's works try to underscore the importance of education in welcoming linguistic diversity. His works are essential to educational policies, second language acquisition and children's cognitive development.

2.2.2 Cognitive Demands and Language Learning

Language acquisition poses various cognitive challenges to a learner regarding possessing, retaining, and using new language structures. They arise from factors like limitations in memory, attention, and the environment. Learners, particularly L2 and L3 learners, experience cognitive overload when they try to learn new grammar rules, syntax, vocabulary and others. Also, the codeswitching and multilingual environment may add further complexities, and socio-economic and educational inequality may also affect the language acquisition process. This section tries to find a glimpse of the literature from existing research to determine the role of cognitive demands in language learning.

In their paper, King and Chetty (2014) investigate code-switching as a linguistic and pedagogical approach that can be used in classrooms, specifically multilingual setups. Code Switching is the

alternation between two or more languages in a conversation. This research was conducted in Cape Town, South Africa, where English or Afrikaans is the official language used in classroom teaching. Still, the teachers often use the native language to help the children comprehend. The teachers also use code-switching to manage the classroom and elaborate on the contents they have explained in English. Even though the study is not data-based and is observational, it describes how codeswitching is beneficial in multilingual classrooms and how it will ease teachers' jobs. Even though educational policies and others bias the limited use of code-switching, it can benefit all if used in a balanced approach.

Agnihotri and McCormick (2010) examine the usage of multilingual signage in explaining the intentions of the creator and the audiences' interpretations. They studied two essential sources: the different linguistic landscapes in Delhi, India and the advertisements of Amul, a major company in India. Moreover, through this study, the authors try to challenge the traditional view of multilingualism, as discussed in the earlier papers, like seeing language as separate systems instead of a fluid language use. Through this paper, the authors try to find the interaction between language, cognition and literacy and how language is represented and used in signage across multilingual contexts. In this study, they say that language comprehension is multimodal, which includes text along with visual images.

Bhattacharya's (2013) paper explores the impact and implications of English Medium Instruction (EMI) in rural school settings in India. She starts by explaining that even though India, a home to many languages, still, only 22 are officially recognised, and 43 are only used as a medium of instruction in schools. The study shows a bias towards English-medium education even if their

parents could not afford it. This ethnographic case study focused on five students from an orphanage in Delhi, India, attending a private English medium school. Through this study, the author examines the literacy tests and teaching strategies in English education, showing that it often leads to the restricted use of other languages, which might be disadvantageous and cause inequality. Through this, Bhattacharya shows that schools usually use English as a social identity and mobility marker, even though they may use local languages for instructions. This paper also critiques the three-language policy mentioned above.

Some cognitive disadvantages include the mismatch between the languages used in different environments such as schools and homes; English language acquisition is passive and primarily based on memorisation, not communication. Bhattacharya quotes Sheorey, saying the “English language functions as a divider rather than a unifier.” It was four-year-long research, and the results were that most of the teaching happened by word-by-word Hindi translation, and students depended on rote-learning the answers in English without understanding the context. Even multiple classes were handled by a single teacher simultaneously, and there was a lack of individual attention. Since the context is given in the word-byword Hindi translation, students often fail to recognise the word’s meaning, which affects vocabulary acquisition. Even the speaking activities were not conducted in the classrooms.

Bhattacharya (2017) critically examines the English language ideologies in India, how colonial legacies continue to shape the perspective of the new generation and the policies on English Language education. This particular study highlights how the introduction of the English language by the British even affects the thoughts of the current generation. This shows that the historical

narratives continue to affect the learners' cognitive attention to the language they are learning. One of the students responded that the English language is a powerful surveillance tool that will help them find threats from English-speaking nations. This paper shows that English remains an elite language, creating a socio-economic disparity in society. The English language remains a gatekeeper to higher education and higher-paying jobs. The paper says that English teaching in India is primarily based on rote learning, and it also suggests a new policy that integrates multilingual perspectives.

2.2.3 Multilingualism, sociolinguistics, and pedagogical approach in English Language Learning

As has already been established in various studies, multilingualism is an innate ability of human beings. Multiple language usage can influence teaching methodologies, learning outcomes, and educational policies in pedagogy and educational setups. This section will cover the sociolinguistic perspective of multilingualism and the role of English in national and international pedagogies.

Singh (2010), in the paper “Multilingualism, Sociolinguistics and Theories of Linguistic Form: Some Unfinished Reflections,” critiques the theories of the monolingual approach and argues for new theories that will consider multilingualism as a norm. Singh challenges the monolingual theories, particularly generative grammar and structuralism. The author gives prior importance to the concept of multilingual reality. In connection with multilingualism and cognitive capacity, this paper discusses how speakers of different languages can be more flexible than speakers of a single

language, suggesting that a multilingual brain processes and stores information differently than others. The author also critiques Chomsky's concept of generative grammar, saying that language competency is not just a set of formal rules but is also shaped by social, cognitive, and multilingual interaction. This points out that structured grammar rules may not be effective for people who can speak different languages. This also points out the failure of educational policies promoting monolingual frameworks. As suggested by various other researchers, Singh also says multilingualism should be considered a resource rather than a challenge.

Wiley and Artiles (2007) discuss the global influence of the English language and its impact on national educational policies. English has now become a global economic resource rather than a colonial tool. The central question is whether English Medium Instruction (EMI) reintroduces inequality or democratises education. English proficiency may widen the socio-economic gaps, benefiting only the elite part of society and disadvantage rural or multilingual students. The authors debate whether English promotes multilingualism or suppresses the native and local languages.

This paper suggests that the government should take steps to balance national educational policies while considering the global role of the English language.

Hauk'as (2016) explores the perceptions of teachers in multilingualism and its role in third-language (L3) acquisition. The study also supports the idea of multilingual individuals being superior in cognitive and linguistic abilities. It also suggests that multilingual individuals can draw comparisons between languages, which helps language learning. However, this is not an automatic process and will require awareness and support from teachers. It is explained that even though

teachers believe multilingualism is an asset, they do not always apply it in their teaching. As described in this paper, teachers always revert to L1 or L2 when explaining concepts in L3; the teachers also believe that learning L3 differs from learning L2. All of this suggests the need for multilingual teacher training.

Chaturvedi (2015) explores the linguistic diversity, code-mixing and the evolution of local dialects in Kanpur, India. The cultural, social and economic factors shape linguistic variation. The people of Kanpur use a mix of languages and dialects while talking in different contexts and environments. They could engage in smooth code-switching, suggesting they have comfortable cognitive control. This study also divides the population based on their linguistic behaviours by social classes into educated urban elite and lower-income groups. Students from lower socioeconomic backgrounds are more linguistically flexible, but the dominance of English in formal education setup disadvantages them. This paper also critiques that language policies fail to accommodate different and emerging multilingual realities. Formal education should also consider integrating the local language cultures and practices rather than suppressing them.

2.3 Pedagogical Approach to SLA

2.3.1 Methods and Strategies in English Language Teaching

Various teaching methods had been employed in teaching the English language over these periods. There has been research on employing strategies and methods in English language teaching that impact students' vocabulary, grammar growth, and overall proficiency.

The paper by Wali, Zafir, and Saeedi (2022) explains in detail the four important English Language Teaching methods, namely, Grammar Translation Method (GTM), Direct Method (DM), Audio-Lingual Method (ALM) and Communicative Language Teaching (CLT). In GTM, the teaching happens in the student's mother tongue. It focuses mainly on the grammar rules and memorisation of vocabulary. As the name suggests, translation is the primary learning tool. No importance is given to speaking and listening, and students rely heavily on rote learning. In DM, the classes are primarily in the target language and use visual aids. It also promotes speaking and listening skills. However, one of the disadvantages is that it is difficult to do in traditional classrooms. ALM was previously called the Army Method, focusing on speaking and listening before the reading and writing part. It mainly emphasises pronunciation and sentence structure. It gives prime importance to accuracy and not to fluency. CLT focuses on real-life communication contexts. The teachers are not passive characters in this Method, and there is constant interaction between teachers and students. This method can boost students' confidence.

Rajeev (2020) explains some more pedagogical approaches other than the four explained above, which will help in English language teaching. The Structural Approach prioritises meaning over structure but lacks trained educators. Structural Oral Situational Approach (SO-S) emerged as an alternative to Direct Method (DM). It focuses on teaching and learning language through context and can be considered less effective due to the Indian syllabus. The Bilingual Method combines both the target and mother tongue languages. Moreover, it is widely used in the Indian syllabus. Community Language Learning considers teachers to be mentors, and this is based on the cognition theory and Krashen's monitor theory.

The Reading Method gives prime importance to reading over speaking. The Silent Way encourages problem-solving skills and uses sound-colour charts, word-final charts, and others. Natural Method mimics the first language acquisition. Moreover, it focuses on the use of language and vocabulary. Suggestopedia makes learning easy with the application of positive suggestions in teaching. Skill-Based Learning and Teaching focuses on language skills: reading, writing, speaking and listening. This method can be applied in private schools, but the author says it is imperfect in the Indian context. There are multiple ways to teach students effectively; a combination can be used depending upon factors like large class size, poor teacher training, and students' individuality. A language can be taught effectively with the use of appropriate methods.

Rajeshwari (2020) explains the importance and need of these methods in the Indian context, where, in India, English is considered a second language. The author goes through these different methods and how these can be employed in teaching English as a second language (ESL) among different learner levels, from primary schools to adult learners. This study illustrates how these strategies should be considered as a continual process of learning that adapts to the child's development. Since most students in India need to learn three languages in school, these methods can be used accordingly. Total Physical Response (TPR) is best suited for the primary level, focusing on listening and action-based teaching and learning. It improves the listening skills of the students. Audio-Lingual Method can be used in the early learning stages. It mainly focuses on the repetition of grammar and pronunciation. This Method improves the students' speaking and reading skills. Moreover, this is often used in Indian primary schools. Suggestopedia or Desuggestopedia can be used in the initial phase of language teaching class.

However, in the Indian context, where the children come from various cultural backgrounds, it is sometimes difficult to fully integrate the target language into the curriculum. The Grammar Translation Method is highly effective in higher accuracy and helps the students with grammar rules and syntax, but it cannot provide fluency. However, one of the significant challenges is that it promotes rote learning, and the students may struggle with speaking in a real-world scenario.

Direct Method is helpful for intermediate learners and does not provide much importance to translation into the mother tongue. Communicative language Teaching is mainly for advanced learners. It focuses on real-life communication and fluency. However, it is presumed that the students have basic language knowledge. In Content-Based Instructions, every subject other than another language is taught in English. It is common in private and English medium schools in India. Task-based Language Teaching integrates the analytical syllabi instead of synthetic syllabi. This involves the interaction of both the students and teachers. The two theories supporting these are:

1. Krashen's Comprehensible Input in Language Learning: Language acquisition occurs when learners are exposed to language slightly beyond their current level that they can understand, fostering natural language learning.
2. Swain's Comprehensible Output in Language Learning: Learning takes place when learners encounter a gap in their linguistic knowledge of the second language (L2)

This paper discusses the importance of adaptability in English language teaching. It puts forward the following points: no single method is ideal, and a combination of different methods is needed. Teachers should be exposed to different methods, and they can create their own methods and strategies if they want.

In the paper by team Varthana (2023), they put forward five different practices for teaching English as a second language in India. The challenges faced while teaching English to Indian students are the translation dilemma, lack of English-speaking environments, limited vocabulary, grammatical errors and peer pressure. To overcome these, the following can be used to understand the purpose and set goals, emphasise the practical application of grammar, use different learning styles and activities, improve phrases and vocabulary, and use technology and gamification.

2.3.2 Memory and Language Teaching

In both the cases of first and second language learning, memory plays an important role in grammar learning and vocabulary acquisition. Multiple studies have examined the impact of working memory, retrieval process and cognitive load on SLA. Working memory helps the learners to hold the linguistic information so they can comprehend and respond aptly and temporarily. The retrieval process enables the learners to store the grammatical rules and vocabulary efficiently. Cognitive load is the mental effort for processing the language and how the learners acquire new linguistic structures. By working on these above-mentioned, the researchers can make new strategies and methods for enhancing second language acquisition (SLA). It can be

achieved by enhancing memory retention and retrieval efficiency and reducing the cognitive load on the learner.

In the paper “Memory as an Important Factor in Learning Vocabulary”, Gaybulloyevna (2022) discusses how important vocabulary acquisition is in language learning. This paper explores the various methods that can be used in teaching vocabulary in a classroom setting. Learning vocabulary and grammar rules are fundamentally different because the first relies heavily on memorisation, and the latter relies on a rule-based system. Motivation, data, opportunities to experiment with the data and constructive criticism are needed to acquire vocabulary successfully. The different types of memory involved are short-term storage, working memory, and long-term memory. Short-term storage (STS) is the brain’s capacity to hold a limited amount of information for up to a few seconds. In the case of vocabulary learning, STS allows learners to retain the newly acquired words briefly. Working Memory (WM) acts as a workspace where the data is processed before storage. These include the mental sketch pad and visual mnemonics (memory prompts). Long Term Memory (LTM) is considered a filing system. It has unlimited storage capacity, and the newly learned vocabulary is transferred from the STS and WM to LTM. Learning challenges occur when the vocabulary is stored in short-term memory and is forgotten before the next lesson. There are different ways to transfer the newly learned words to long-term memory. They include repetition without rote learning; retrieval practice, which includes active recall; spacing or distributed practice, like spaced repetition; and pacing; each student is different, so their ability to learn new vocabulary also differs; use it or lose it is the next one; cognitive depth says that the more effort they put into the learning of new words, the better they remember those words; personal organisation suggests that the students remember the words better if they

create a personal connection with the words; imaging and visualising the words can help in remembering the words better; memory tricks such as mnemonics also helps in remembering the vocabulary; motivation is another important factor; attention and arousal along with affective depth also help in learning new vocabulary. There are multiple ways to remember the new words, which is memory-dependent.

Koert et al. (2022) investigate how the phonological short-term memory and verbal working memory spans play different roles in vocabulary and grammar acquisition in Dutch as a first language (L1) and English as a foreign language (EFL). Phonological short-term memory (PSTM) is associated with learning of vocabulary, and working memory is linked to grammatical proficiency. The key question these authors provide is whether these memory methods contribute differently to learning of vocabulary and grammar in L1 and EFL. The PSTM is measured using non-word repetition (NWR), and WM is measured using a backward digit span task (recalling the numbers in reverse order). In vocabulary learning, past knowledge about vocabulary contributes to the L1 vocabulary growth, and PSTM did not significantly affect the L1 vocabulary growth. They also found that the past knowledge of vocabulary in L1 contributes to the EFL vocabulary. PSTM only affected minor levels and was not dependent on EFL vocabulary learning. In the case of grammar learning, verbal working memory impacts L1 grammar learning and is also dependent upon past performance in L1 grammar acquisition. However, working memory does not contribute to EFL grammar acquisition, and past performance remains a more potent factor in EFL grammar learning. Thus, activities that impact phonological memory can be done while teaching beginners. In advanced learners' cases, lexical knowledge can be given more importance than rote learning or memory-based activities.

Faitaki et al. (2022) explore how young learners learn grammar and vocabulary when English is not their first language but an additional language (EAL). The authors talk about language learning, EAL learning and the challenges and the possible factors contributing to learning. The students in the EAL environment learn English in a formal setup while speaking a different language at home. The data and research suggest that they acquire vocabulary and grammar rules more slowly than their monolingual English-speaking peers. There is a considerable difference in vocabulary depth and size between the two groups. There is a delayed grammatical difference in EAL students, and they may understand the grammatical concept differently than their monolingual peers. Also, their first language seriously affects their English grammar learning.

Age also affects this acquisition.

These studies highlight the impact of memory on vocabulary and grammar rules learning. These studies laid a foundation for future studies to check how memory plays a role in learning English as a second language acquisition.

2.3.3 Cognitive and Sociolinguistic Factors and SLA

Cognitive and sociolinguistic factors are crucial in language learning, particularly in a multilingual setup like India. Cognitive functions such as memory, attention, and execution, as well as sociolinguistic factors like exposure to language, interactions, and cultural aspects of language learning, play a significant role in learning a second language. The following literature explores the interplay between cognitive development, multilingual setup, sociolinguistics, and SLA.

In their paper, Mishra and Das (2015) explore the cognitive aspects of secondary students in Uttar Dinajpur District. They focused on perception, attention, memory, thinking, concept formation, reasoning and other factors. Their objectives were to measure the descriptive nature of the secondary students' cognitive aspects and determine the stratified mean difference concerning the cognitive aspects. Their study provided the following results after the data collection: memory retention is not affected by gender or locality, implying that basic memory skills are universal among all; urban students showed relatively higher problem-solving and reasoning skills; the small connection between gender and cognitive skills can be attributed to the sociocultural factors which may favour the male students. The study highlights the need for different methods for different sections based on the particular difficulty faced by each section.

Tsimpli et al. (2020) examine multilingualism and linguistic diversity and their relation with cognitive skills in socio-economic-culturally disadvantaged children in India's two states, Delhi and Hyderabad. This study focuses on linguistic diversity (multilingualism or sociolinguistic) and cognitive abilities, as the previous studies had already focused on bilingualism and cognitive gains. The hypothesis proposed by the authors was that bilingualism and language diversity will have an independent relationship with cognitive abilities. This test employed the n-back task and Raven's coloured progressive matrices tasks. The results were as follows: monolingual children were outperformed by the bilingual children in the case of cognitive skills tasks. Socio-economic status had a minimal influence, unlike the studies conducted in the West. Since the mother tongue differed in the two states, it was found that while comparing, the Hindi medium students performed better than the Telugu medium students.

Hartshorne et al. (2018) studied the importance and effects of the Critical Period Hypothesis (CPH) in Second Language Acquisition (SLA). They collected data from non-native English speakers. The key questions they addressed in the study were: How does learning ability vary with age? Furthermore, how skilled can someone be if they started learning at a specific age? They explained the previous theories in the fields, including neural maturation, interference from the first language, and other causes like societal and motivational interference. The study supports the CPH but does not align with the previous timeline; instead, it creates a new one. Ultimate proficiency declines with age, but learning ability remains active until late adolescence. Achieving natural proficiency takes a long time, and reaching a native-like level may not always be possible. One of the strengths of this paper is that it has included a large data sample.

Brahim (2019), in his paper, aims to elaborate on cognitivism and its implication in second language acquisition. It explores the SLA based on intelligence, aptitude and cognitive learning styles. It explains the three views of SLA, namely the behaviourist view, innatist view, and interactionist view. The behaviourist view, the empiricist view, is based on a stimulus-response mechanism. And also, on habit formation. The innatist view is based on Chomsky's nativist idea. Chomsky, one of the first spokesmen, rejected the idea of behaviourism and proposed the innate ideology and Language Acquisition Device (LAD). He also proposed Universal Grammar ((UG). Lenneberg proposed the CPH, which suggests that language learning is easier before puberty. The interactionist view, developed by Piaget and Vygotsky, gave more importance to social interactions. The language learning strategies include problem-based, discovery, cognitive, and project-based learning. The cognitive factors influencing the SLA are intelligence, aptitude, and cognitive learning styles (how individuals perceive, process and respond to different information).

The different methods through which teachers can help students learn a second language include providing tailored instructions based on the students' needs, using scaffolding techniques, and implementing an interactive and communicative class.

This literature review explores the key research and studies conducted on memory, cognitive development, age, socio-cultural, economic factors, and pedagogical approaches in SLA. Through the literature review, the effect of memory playing on vocabulary, grammar acquisition, and overall proficiency has been identified. Studies on age-related language learning have proposed that the younger the learner, the better to achieve native-like proficiency. The effect of multilingualism in SLA has been explored. It paves the way for developing new teaching strategies and pedagogical approaches. Despite all these studies, some issues remain regarding the clarity of the interplay between SLA and cognitive, social, and pedagogical factors and their importance. Students can improve their SLA using multilingual educational policies, learning strategies, and instructional techniques. By understanding these factors better, it is easy to communicate in a real-world situation, and it helps students achieve overall proficiency for different types of learners.

2.4 Identified Research Gaps

Much research has been done in different but related language, cognition, and teaching fields. Nevertheless, many gaps remain in understanding and identifying the mechanisms that affect second language acquisition (SLA). Previous studies have tried to identify the roles of memory,

cognitive development, and socio-cultural factors contributing to or obstructing SLA. However, there has been less research on how these affect the different learners from diverse demographic and educational setups. The existing literature highlights the importance of memory in L1 acquisition, and there is insufficient data on how the different types of memories affect L2 acquisition, namely, working memory and long-term memory. Similarly, there has been various research on how cognitive development affects language acquisition, particularly L1 acquisition; at the same time, there is not enough data about the relationship between age and efficiency and proficiency in L2 acquisition. Also, the role of the internal and external environment in L2 acquisition has not gained much recognition compared to L1 acquisition. Different pedagogical approaches and cognitive overload in SLA should also be given importance. More studies are needed on how memory affects language acquisition and the connection between cognitive development and second language acquisition, where English acts as the second language, particularly in a multilingual environment, as in the case of India. Only limited research has been conducted on how memory affects grammar rules' fluency, pronunciation and retention.

Examining cognitive overload in learning English as a second language is also needed.

2.5 Research Directions

Despite the vast research done in linguistics, cognition, pedagogy, and psychology, several gaps remain in the case of second language acquisition. The interaction between memory, cognition and multilingual pedagogy needs to be studied. Examining how different memory mechanisms,

such as working and long-term memory, affect the retention of vocabulary and grammar rules is necessary. How multilingual individuals use code-switching and the introduction of a new pedagogical approach focusing on multilingualism can be further studied.

Chapter 3

Methodology

This chapter outlines the research materials and methodology by expanding on the research questionnaire design, means of data collection, participants and techniques. This study used a mixed method for collecting data, where primary data was collected from the survey, and secondary data was collected from a comprehensive literature review. The research used quantitative survey data, which was analysed first, and later, results were interpreted from the existing literature to review the findings. The study was structured so that it could be used to investigate the students' English language proficiency and their difficulties and factors affecting their proficiency through a questionnaire that assessed both the quantitative and qualitative factors.

3.1 Model of the questionnaire

The study was structured as a quantitative study on a survey-based questionnaire consisting of multiple choice, Likert-scale, and short answer questions. These questions helped assess their

English language proficiency and the factors affecting them. The questionnaire contains structured and semi-structured questions. There were multiple-choice questions on reading comprehension from a passage and verbal reasoning through analogies and word associations. Then, there were multiple-choice questions on grammar proficiency, like error identification and sentence completion. Also, with the help of the Likert scale, there were questions to get insights into their language use and perceptions, such as English language usage, confidence and challenges. This particular format was used to allow statistical analysis to find patterns and to get qualitative insights while they were using the English language. Cognitive-based questions, such as reading comprehension, grammar, and verbal reasoning, and affective-based questions, such as difficulty, motivation and attitude, helped determine the conclusion. The quantitative part of the questionnaire, such as the multiple-choice questions from the reading comprehension, grammar and verbal reasoning, was analysed statistically. The qualitative questions, like the open-ended questions, could shed light on the students' subjective responses to analyse them and find patterns. The empirical data can be obtained from the survey responses and interpretative data from students' responses about their challenges.

3.2 Justification for using this particular format

The data can be interpreted using descriptive and statistical analysis, which can be used to conclude the data to find language learning patterns among the students. This model of survey-based questions is apt for considering the study's objectives. The research tries to analyse the

learner's English language proficiency and perceptions. So, this structured questionnaire will help collect the data and conduct further analysis. In addition, this structured questionnaire will help with the statistical analysis and pattern finding among the responses. This particular data collection format was proposed and found compatible considering its efficiency, where many data can be collected quickly. Later, it was also selected because of its objectivity, as this questionnaire format can help minimise researcher bias, which will otherwise be reflected in the data. Also, this model will make it easy to quantify the results and analyse the different patterns from the data. This data can be used for future comparative studies as well.

3.3 The area chosen for study

The area chosen for the study is two schools in the Kottayam District of Kerala State in India. The environment of the study is a second language environment where the English language is used in the environment outside the school. St. Mary's (SM) is in a semi-urban area, and Sacred Heart's (SH) is in a semi-rural location.

3.4 Description of the population

Eighty-nine students from two schools, namely, St. Mary's (SM) and Sacred Heart's (SH), were chosen to collect the data in India's Kottayam district of Kerala state. Forty-four students from the first and forty-five from the second schools participated in the study. Class 9th students were selected because of their age, as they do not fall into the category of children or adults. Both

schools were girls' schools. Consent from the District Educational Officer (DEO) was obtained, and permission from parents and students was collected. Data was collected only from those students whose consent was signed by both. All these students are learning English as their second language in a second language setting and not in a foreign language environment. All students were enrolled in an English medium class where all subjects other than languages were taught in English. This was used so that all the students would be of the same proficiency levels.

3.5 Inclusion and exclusion criteria

The inclusion criteria were as follows: The students should be enrolled in an English medium class, and those studying the English language in a second-language environment have filled out the consent form. Eighty-nine students participated in the study, giving sufficient data for a comprehensive analysis. Those students with any severe language learning disability were excluded, along with those who did not return the consent form signed by both parent and student.

3.6 Design of the questionnaire

The structured questionnaire consisted of four sections. The first section was reading comprehension. A passage was given to the students for reading, and multiple-choice questions for assessing comprehension skills followed. This section had three questions, including finding the passage's main idea, a summary of the author's argument and finding the meaning of a phrase.

The following section was verbal reasoning, where questions on analogies and word association were given to evaluate their linguistic abilities. There were questions to find the relation between words and questions to find synonyms and antonyms. The third section was to analyse their grammar proficiency. There were questions to identify the errors in the sentences and sentence completion. This section can be used to assess the grammatical accuracy of the participants. The fourth and final section of the questionnaire consisted of Likert-scale questions that collected data about their confidence and comfort in using English, their challenges in vocabulary and grammar rules retention and self-assessed fluency.

3.7 Administration of the questionnaire

The data was collected from the two schools in two days, where the data was collected from the students simultaneously. The students were asked to answer the questionnaire in a controlled room where they were instructed not to discuss it with other peers, and they were given prior clear instructions to avoid misinterpretation of the questions and instructions. There was no time limit. All students could submit the final questionnaire in 1 hour, most taking only 15-20 minutes. They were instructed to move to the following questions upon completing the previous.

Responses were anonymous to ensure their honest participation.

The data was then compiled into an Excel sheet for analysis.

3.8 Data analysis methods

The collected responses were converted to digital data with the help of Excel sheets. These responses were analysed through simple percentage calculations to find the trend in their performance. The first part of the multiple-choice questions was simply a right or wrong analysis. After the digital data was made, for each of the 11 questions, the percentage of right or wrong responses was calculated and plotted. The school's wise pie chart and the total pie chart were made. This analysis assesses students' strengths and weaknesses in reading comprehension, verbal reasoning and grammar. The simple percentage was calculated using the standard method using the following equation:

$$\text{Percentage of Correct response} = (\text{number of correct answers} / \text{Total responses}) * 100$$

The same equation was also used to find the percentage of incorrect responses. Analysing the data and plotting them in pie charts helped identify and mark common errors, misconceptions, or misinterpretations of concepts. For the Likert-scale questions, the student's attitudes and challenges were obtained through five points, namely:

1 = Never

2 = Rarely

3 = Sometimes

4 = Often

5 = Always

Responses were analysed in terms of percentage distribution, and this particular analysis helped in understanding the students' confidence in using the English language and their challenges and difficulties.

The fourth question from this set was to mention the student's particular difficulty in learning the English language. Through this open-ended question, their responses were categorised into the main difficulty that the students faced. Common themes were identified through this question.

3.9 Ethical considerations

Informed consent was obtained from both students and guardians before participation. The responses were kept anonymous to protect the students' identity. They were also informed that they could voluntarily stop participating even in between the tests. Survey data is stored securely according to the guidelines.

3.10 Limitations of the study

There could be self-reported bias from the participants, such as under or over-reporting themselves. This study cannot be taken as a generalised study, as this study was conducted in two specific educational institutions and cannot be taken to generalise all English Second Language (ESL) learners. The data could differ significantly from the results collected if we change the educational institutions to other places. There were issues of time constraints, and it was not

possible to collect further data or follow-up interviews, which may have given a deeper understanding. No prior training was given to the students, and the questionnaire was made after referring to the examinations conducted by the state education department; the questions were slightly modified. One-to-one interviews could have been incorporated, but they must be eliminated due to time limitations.

3.11 Justifications for using the questionnaire

Even though there may be limitations as the students are reporting themselves, including the objective questions ensured the data's validity. Moreover, the one subjective question also gave more insights to the objective questions. There was a clash in some of the data, which made the data analysis tricky. This study can be used as a baseline for future research related to the topic.

3.12 Conclusion

This chapter explains the methodology of the study, the research design, the selection of participants, the data collection, and the analytical methods. Through this survey-based, mixed method approach, the experiences and proficiency of the student's English language ability can be assessed. The following chapter talks about the results and discussion of these survey data.

Chapter 4

Data Analysis

This chapter explains the trends, patterns, and statistical records of the survey responses after collecting the data from two schools, namely St. Mary's (SM) and Sacred Heart's (SH), in the Kottayam district of Kerala state in India. The data was collected from 89 students from the 9th grade from two schools, 44 from school SM and 45 from school SH. The survey had questions to assess the student's English comprehension ability, proficiency in English, and difficulties while learning English. The survey contains multiple-choice questions, such as comprehension of a passage, verbal reasoning, and grammatical questions, to test their English proficiency. There were open-ended questions to assess their background and difficulties while learning English. The responses can be analysed in two sections:

1. Multiple-Choice Questions (MCQs): These questions were used to examine the accuracy of the 11 questions and subsequently to analyze student performance patterns.
2. Subjective Responses: These were used to analyze the self-reported difficulties of students while learning English, how often they use English outside schools, and how confident they are in using English both inside and outside schools.

The data collected from the survey responses was used to identify the accuracy rates, and students were categorized based on their subjective answers to the challenges they faced while learning the English language.

4.1 Analysis of Multiple-Choice Questions

The survey included multiple-choice questions across three significant sections: passage comprehension, verbal reasoning, and grammar.

4.1.1 Q1. Passage based questions

The majority of the students answered the first question (Q1a) correctly. Taking both schools and a total of 89 students, 78.7% of the students answered correctly, and 21.3% gave the wrong answers. Taking the individual schools, out of the 44 students of the school SM, all the students provided the correct answer, whereas, out of 45 students of the school SH, 57.8% could provide the correct answer.

The second question from the passage comprehension (Q1b) was to identify the paragraph summary. Of 89 students across the two schools, only 58% could correctly identify the answer from the options. On taking the individual school, 72.1% of the 44 students in school SM could give correct answers, and 44.4% of 45 students of school SH correctly marked the answer.

The passage comprehension's third question (Q1c) was identifying what a phrase meant. Out of the total of 89 students, 91% of the students correctly marked the answer, and from the 44 students of the school SM, all correctly identified the answer, and from the 45 students of the school SH, 82.2% marked the correct answer.

Looking at the general overview of question 1, we see that most students had high accuracy. Most students answered the Q1a and Q1c parts correctly, while the Q1b part had a slightly lower accuracy rate than the Q1a and Q1c parts. Students of school SM performed somewhat better than students of school SH in Q1b and Q1c, suggesting that Q1b was challenging for both schools, which indicated a moderate error rate. Students generally performed well in this section.

4.1.2 Q2. Verbal Reasoning questions

The first two questions were to find the relation between two components if an existing relation was provided.

In the first question (Q2a), out of the total 89 students, 89.9% gave the correct answer, and all of the 44 students in school SM gave the correct answers. Meanwhile, 80% of the 45 students in school SH could provide the correct answers.

On assessing the second question (Q2b), out of the 89 students across the two schools, 89.9% choose the correct options. In the school SM, out of the 44 students, 97.7% gave the correct answer; in school SH, out of the 45 students, 82.2% gave the correct answer.

The following two questions were to find the synonym and antonym.

In question three (Q2c), 82% of the total students marked the correct option, whereas, in school SM, 93.2% of 44 students could find the correct answer; in school SH, out of the 45 students, 71.1% marked the correct option.

In the final question from this section (Q2d), to find the antonym, we could see a slight difference. Of the 89 students, 83.1% could identify the antonym of “Protect”. Among the 44 students from the school SM, 86.4%, and from the 45 students in school SH, 80% were able to mark the correct answer “Harm” from the two options.

On analyzing the verbal reasoning questions (Q2), there was moderate to high accuracy among Q2a and Q2b, whereas Q2c and Q2d had a notable drop in accuracy, suggesting these questions might be more challenging. Students of SM showed better accuracy rates in Q2a and Q2b, while students of SH gave more incorrect answers in Q2c and Q2d. The latter suggests that the synonym and antonym concepts are unclear for SH school students.

4.1.3 Q3 Grammar Questions

In this section, the students were asked to find the error in two sentences and to complete the sentences by filling in the blanks.

In the first question (Q3a), out of the 89 students, 73% gave the correct answer. On checking the individual results of the two schools, the students of school SM had an accuracy rate of 81.8% for 44 students. Of the 45 students in the school SH, 64.4% could give the correct answer.

In the second question (Q3b), which also sought to find the error in the sentence, out of the 89 students across two schools, 71.9% gave the correct answer. On taking the analysis of individual schools, out of the 44 students from school SM, 72.7% marked the correct answer, and in school SH, having a count of 45 students, 71.1% gave the correct answer.

The following two questions were to find the missing word and complete the sentences.

In the third question (Q3c), only 34.8% could correctly identify the missing word. If we check the individual schools, from the 44 students in school SM, 56.8% gave the correct answer; if we take the second school SH, out of the 45 students, the accuracy rate was only 13.3%.

In the final question from this section (Q3d), of 89 students, the accuracy rate was even lower than that of the previous question. Only 29.2% were able to mark the answer correctly. On taking the individual statistics of both schools, from the 44 students in school SM, 45.5% were able to mark the answer, whereas, in school SH, out of the 45 students, 13.3% marked the correct answer.

The results of the third section, which consisted of grammatical questions, Q3c and Q3d, were difficult for most students. The students of SM showed more accuracy than the students of SH.

4.1.4 Analysis of the questions 1, 2, 3

If we look at the overall performance, the students performed well in Q1a, Q1c, Q2a, and Q2b but struggled with Q1b, Q2c, Q2d, Q3c, and Q3d. Most of the subsections show that students of SM had a higher accuracy rate than students of school SH. This data indicates that the problematic sections were Q2c, Q2d, Q3c, and Q3d. From these four questions, Q2d and Q3d had the highest numbers of errors across both schools. Q1a and Q3a were the easiest, with most students correcting them.

4.2 Analysis of the Survey Responses

These sections had survey questions, and where the answers were to be marked on a Likert scale measuring frequency and agreement. A five-point scale was used.

The first question was, “Are you using the English language outside schools?” Many of the students replied, “Sometimes”. The proportion was coming about 51.7%. A small group of students opted for “Always” and “Often,” suggesting the limited English language use outside schools. 9% of students mentioned “Never.” Similar trends were observed in both schools, with SM having a slightly increased number of students using English frequently.

The second question was, “Do you use the English language while talking with English speaking people?” Around 34.1% of students marked “Sometimes” for this question. 20.5% of students had opted for “Always” as the answer.

The next question was, “Do you enjoy learning the English language?” 34.8% of the total students said they always enjoy learning the English language, and still around 5.6% said they never really liked learning English. The trends were nearly similar in both schools. School SM students showed more enthusiasm than students of school SH.

The next two questions were as follows: “Do you find it easy to remember English vocabulary?” and “Do you find it easy to have a good memory of English grammar rules?”. The data shows that remembering the English vocabulary was more manageable than following grammar rules. 39.8% of students opted for “Sometimes” for remembering vocabulary, and 42% of students

opted for the same option in remembering grammar rules. Only 1.2% of the total students said that they “Always” find it easy to remember the grammar rules, while 4.6% of the total students said that they find it “Always” easy to remember vocabulary.

The next question was, “Do you find it easy to comprehend when English is spoken quickly?” Comprehending speedy English speech was difficult for most of the students. About 43.8% of the total students opted for “Sometimes” to this question, and about 6.7% of the students marked that they “Always” find it easy to comprehend fast English speech when 6.8% of the students of school SM said that they could “Never” comprehend fast English speech, at the same time, the same option was chosen by about 11.1% in school SH.

The survey’s final question was, “Do you find it easy to express yourself in English?” The majority of the students reported that they are struggling with expressing themselves in English.

The highest number of answers was “Sometimes,” up to 42.7%. On taking the individual data of both the schools, in the school SM, 6.8% faced complete difficulty (Never) while expressing themselves in English. In contrast, that proportion was about 4.4% in school SH. The data shows that students of school SH were confronting a higher difficulty than SM students while expressing themselves in the English language.

A general overview of these survey questions shows that students enjoy learning English, but certain aspects like grammar, speaking skills, comprehension, and vocabulary were the significant challenges. More students answered that vocabulary is easier to remember than grammar rules.

Many of them have written that they have difficulties speaking and expressing themselves in the English language.

4.3 Focusing on questions related to memory and comprehension (Q 5, 6, 7)

What we can observe is a strong connection between Q5 and Q6. These questions assess memory retention, and the response patterns are similar. It shows that students who struggle with vocabulary also tend to struggle with grammar rules. This data shows that improving one's memory may contribute positively to another's. In these two sections, most of the responses were "Rarely" or "Sometimes". In contrast, Q7 shows a slightly different pattern. More students opted for "Rarely" or "Never."

Understanding spoken English requires both the knowledge of vocabulary and grammar rules. With the help of questions Q5 and Q6, as well as question Q4 and the analysis of question Q7, it is evident that those who find it hard to remember vocabulary and grammar rules also find comprehension difficult. However, listening comprehension depends on previous exposure, practice, and understanding of the dialogues from the context and surroundings. The above could point out that those better at this will comprehend the dialogues easily without much memory of vocabulary and grammar rules.

If we look at the general trend, many students opted for "Rarely" and "Sometimes" for all three questions. This points out that these three problems, vocabulary, grammar rules, and

comprehension, are the significant challenges most students face. Only a few students have opted for “Often” or “Always,” which implies a lack of strong proficiency in these areas. Compared to the above two questions, the question that asked for their ease to comprehend when English is spoken quickly showed more negative responses, such as ‘Never’ or ‘Rarely’.

Which points out that comprehension is the most difficult of the three.

4.4 Analysis of the data collected from the Subjective question

The fourth question was subjective: “Do you have any specific difficulty while learning the English language?” Most of the students reported that learning grammar was the biggest challenge. Then, it was followed by challenges in learning vocabulary and speaking skills. Some of the students reported difficulties in learning pronunciation and writing skills. Most of the students in school SM expressed difficulties in studying grammar rules and using them, while the students of SH mainly struggled with comprehension and pronunciation.

We break up these into five parts: Grammar, Vocabulary, Speaking, Comprehension, and Writing.

1. Grammar: Many students’ entries reveal that they struggle with understanding and applying grammar rules. This trend appeared very frequently in the data.
2. Vocabulary: Learning and remembering vocabulary was the next major challenge faced by students. They remarked that remembering vocabulary and retaining new words and phrases were difficult for students.

3. Speaking: Some students were concerned about their difficulty in speaking fluently and confidently. They also pointed out that they struggle with pronunciation.
4. Comprehension: They also mentioned that they found some of the discourses in the textbook and exams difficult as they found them challenging to comprehend.
5. Writing: Some students showed difficulty in writing, mainly rooted in problems with grammar rules and vocabulary.

Chapter 5

Discussions

The present study explores the relationship between language, cognition, and teaching in the context of English as a second language in a multilingual environment. The data was collected from 89 students from two schools in Kottayam, Kerala, India, namely St Mary's (SM) and Sacred Heart's (SH). This data provides valuable insights into the participants' overall English proficiency.

Through multiple-choice questions (MCQs), reading comprehension, verbal reasoning, and grammar were analysed. The subjective and Likert-scale questions drew insights into the students' difficulties and challenges while learning English. This discussion tries to understand the challenges and difficulties and find their potential reasons.

5.1 Analysis of the MCQs

5.1.1 Passage Comprehension

The passage-based questions' results indicate that most students could answer the Q1a correctly.

However, in Q1b, which was to find the passage summary, the overall accuracy dropped to 58%, indicating that the students had difficulty identifying the passage's key idea or summary.

The third question, Q1c, was about finding the meaning of a phrase from the passage. This Q1c also had high accuracy rates, suggesting that the students found identifying the specific phrases easier than summarising the entire paragraph. The possible implications of the results are, as shown by Q1b that students struggle with grasping the passage's main idea. This may be due to a lack of exposure and practice in identifying the key idea from a seen or unseen passage.

5.1.2 Verbal Reasoning

Students performed better in Q2a and Q2b, both of which were to find the relationship between two words. However, the accuracy rates dropped while answering the Q2c and Q2d questions.

The latter two questions were to identify synonyms and antonyms. This trend is quite evident in participants from school SH. The lower performance can be attributed to vocabulary learning and knowledge gaps. The participants may not have a clear idea about the contextual usage of

English vocabulary. So, it is challenging to identify the words with the same or different meanings. This can also be due to a lack of real-world communication.

5.1.3 Grammar Questions

The students' performance in grammar questions was inconsistent. When the students performed relatively well in Q3a and Q3b, which were to identify the errors in the sentence, they struggled significantly in Q3c and Q3d, both of which were to fill the blanks from the provided options. This suggests they lack solid knowledge of grammar applications, particularly syntax and word choice. The results also indicate that students find identifying the mistakes easier than correctly applying the grammar rules in a sentence.

The data suggests that the participants may lack exposure to complex texts, requiring deeper comprehension and summarisation ability. They also lack adequate grammar practices—the responses to the subjective question further support these. Many students reported difficulty learning, understanding, and applying grammar rules. The results from the data also point to the lack of vocabulary knowledge and remembering the vocabulary and new words; this points out that it can hinder the ability to use and comprehend the English language effectively. This was also supported by the subjective question, in which the participants responded by writing that they face challenges while learning vocabulary and grammar rules and remembering them.

5.2 Key Insights from the Likert-Scale Responses

5.2.1 English Usage Outside Classrooms

By analyzing the first question, most of them rarely or sometimes used the English language outside the schools. This points out the limited exposure to the English language outside the classrooms in daily life, which hinders the participants' overall fluency and proficiency in English and language development. This can also be due to the inconsistent practice in English communication, which will affect the students' real-life communication and further affect or increase their listening, speaking, and comprehension difficulties.

5.2.2 Talking with Native English Speakers

Connecting with the previous question, only a tiny percentage of students use English while speaking to native speakers of the English language. This may be due to a lack of confidence, lower comprehension ability, and proficiency in using English for communication. Lack of speaking practice, difficulty with pronunciation, and limited speaking practice.

5.2.3 Enjoying the English Language Learning

Most participants said they “always” enjoyed learning English, but 5.6 % said they never liked it. This may be due to the lack of different and enjoyable ways to learn and teach the English language.

5.2.4 English Vocabulary and Grammar Rules Retention

The data shows that the students find it easier to remember vocabulary than grammar rules.

Most participating students chose “sometimes” for both the questions (Q5 and Q6). This indicates they struggle with memory retention when learning vocabulary and grammar rules.

This may be due to the lack of regular practice in refining and modifying their knowledge.

They may engage in regular, consistent classroom practices but not use or modify them outside the schools in different environments and situations. These challenges stem from conventional teaching mechanisms and rote learning processes, and this can be reduced by explicit teaching methods and repeated practices, which are included in classroom activities for better overall proficiency.

5.2.5 Comprehension of Spoken English

The results show that the participants face significant difficulties speaking and comprehending when English is spoken quickly. This might be rooted in the lack of speaking outside the classrooms, which may cause trouble speaking fluently and confidently. This can be due to reduced opportunities to practice speaking in a conversational setup. As indicated in section 5.2.1, the limited use of English outside classrooms may contribute to this. Some students also mentioned having difficulty with pronunciation, which can be a barrier to speaking confidently and proficiently. Also, limited listening practices can cause a lower rate of comprehension.

They may not be exposed to proper conversation or communication in English especially at a natural pace.

5.2.6 Expressing in English

The majority of the participants struggled to express themselves in English. Limited exposure to communication in the English language and lack of confidence also contribute to these mentioned difficulties. Furthermore, without active engagement in real-life conversation in the English language, students may struggle with English comprehension and expressing their ideas and needs.

5.3 Responses to the Subjective Question

Grammar rules, vocabulary, speaking, writing, and comprehension were the significant challenges faced by the participating students. Several factors may contribute to these observed challenges. They included limited English language exposure; the participants, through their responses, showed that they use English only in academic settings, which reduces many opportunities for further learning. Lack of confidence is another factor. The fear of making mistakes makes them more concerned about using English and reduces their motivation to use it further. Traditional teaching methods like grammar-translation (GTM) make the classroom less engaging and interactive. These can all contribute to the challenges that may affect the students in the future.

5.4 School-Specific Trends

Through the collected data, a comparison between the two schools was identified. The School SM is a semi-urban space, whereas the School SH is a semi-rural setup. Students from the school SM generally performed better than school SH students in most sections. For example, in Q1b, which was to identify the summary of the passage, 72.1% of the students in SM answered correctly, as against 44.4% of students in school SH. Some of the students in school SH could not write their answers to the subjective question in English and wrote them in their mother tongue, Malayalam. The possible reasons for these are the background of the participants. The sociocultural-economic background was different in both schools. Adequate parental support helped the SM students perform better in their academics. Another reason is the traditional teaching practices, like Grammar Translation Methods (GTM), and students relying mainly on rote learning. Student motivation is another crucial factor. It is evident from the data that students of school SM were more enthusiastic about learning English than school SH students. The higher motivation may have a direct impact on their performance. There is better availability of resources in the semi-urban spaces than in the semi-rural space; this may contribute to the better resource utilization of students in school SM than in SH.

5.5 Implications of the Data on Teaching and Learning English Language

The data analysis shows that students need support in various critical areas to achieve overall English proficiency. On checking the data, it is clear that the students need more focused and interactive lessons to practice and learn vocabulary and learning. Using contextual exercises helps the students to learn grammar rules and new vocabulary. Difficulties in speaking and

learning skills, as self-reported by the students, need to be improved, and their comprehension skills need to be worked on. More opportunities to interact and engage in English conversation should be provided, where English is spoken naturally. This can be done in homes and schools. Thus, the participants can confidently engage in real-life conversations. In classrooms, group discussions, debates, role-playing, and other listening exercises can be included to help the student achieve complete comprehension and to engage in conversations. Also, exposure to students to English outside the classroom can contribute to achieving overall proficiency. They can be encouraged to read and watch English books, movies, or television shows. They can be encouraged to enroll in local English-speaking clubs, or the schools can take the initiative to make one. In addition to the above, new teaching plans and techniques can be created to address the specific needs of children wherever they feel challenges. All these methods can help the students to achieve overall proficiency in English.

As a conclusion of the data collected, it is evident that the students face multiple significant challenges that need to be addressed without much delay, which may, in the future, create reduced proficiency. Those are grammar and vocabulary learning difficulties and speaking and listening, which collectively point to a lack of correct comprehension. Even though most students responded that they enjoy learning English, they struggle with applying the knowledge in the practical world. The difference in performance between the two schools may be due to varied teaching practices and student's motivation. If these challenges are appropriately addressed and student-centric teaching methods are made rather than teacher-centric, maximizing the opportunities to use the target language inside and outside the classrooms can contribute enormously to the student's overall proficiency, thus enabling them to communicate in a global language.

5.6 Connection with the Literature Review

5.6.1 Role of Memory in Language Acquisition

The questionnaire data analysis suggests that students have difficulty remembering grammar rules and vocabulary. This points out that memory plays an active role in language acquisition.

In their studies, Gaybulloyevna (2022) and Koert et al. (2022) emphasize and explain the role of working memory and long-term memory in English language learning. Memory limitations could also negatively affect the ability to retain and recall grammatical structures, which traces back to the innate and learned aspects of cognition in linguistics. Krashen (1981), in his book, explained the Monitor Hypothesis, which says that conscious grammar knowledge is only needed when the speaker has to reflect on the language use, which aligns with results interpreted from the data, which shows that students struggle with grammar retention rather than vocabulary. The low accuracy rates in Q3c and Q3d show that explicit grammar knowledge cannot be fully internalized and learned by heart, and it may hinder expression in English when it is a second language.

Koert et al. (2022) also showed that memory can hinder fluency because the learner has to recall and remember the previously stored information from long-term memory and use it adequately. Also, Gaybulloyevna (2022) suggests some memory retention strategies like spaced repetition and retrieval practices to improve memory retention regarding vocabulary and grammar rules. As the response to the subjective question and the Q5 and Q6 of the Likert-scale questions, it is evident that those who struggled with remembering grammar rules also

struggled with vocabulary recalling. This supports the study's central question: the relationship between memory and language acquisition.

The questionnaire suggests using methods that enhance memory, like mnemonics, visual aids, spaced repetition, and other mechanisms that improve vocabulary retention and grammatical rules. These are how cognitive skills can be developed more, and they align with the study's first hypothesis, which was finding the relationship between memory and language acquisition.

5.6.2 Cognitive Development and SLA

The questionnaire data shows that students from the school in a semi-urban space (SM) performed better than students in a semi-rural school (SH). Examples can be drawn from the verbal reasoning questions; when 94.3% of SM students gave the correct answer, only 78.3% of SH students could correctly mark the answer. Also, in the grammar section, in Q3a, when 64.2% of school SM provided the correct answer, only 40.5% of school SH could identify the correct answer. This contrast can be attributed to cognitive development differences, exposure to English outside the classrooms, or a lack of resources to modify their ability.

The literature review goes through how various factors of cognitive development, like memory, attention, and problem-solving skills, play a necessary role in SLA. Tsimpli et al. (2020) and Mishra and Das (2015) highlight the importance of cognitive skills in SLA, especially in multilingual contexts. Tsimpli et al. (2020) explained through their research that bilingual children performed better than monolingual children. However, the questionnaire data suggests that the students in semi-rural school SH performed relatively lower than the semi-urban school SM. It can be due to the limited exposure to English and fewer opportunities to modify their

cognitive skills. This section positively aligns with the study's second research question: to find the connection between cognitive development and English SLA.

5.6.3 New Pedagogical Approach in Language Learning

The data analysis shows that the students struggle to learn vocabulary, grammar rules, and speaking and listening skills. 42% of total students reported “sometimes” in the Likert scale question to analyze how easy it is to remember the grammar rules, whereas 39.8% of the total students marked “sometimes” for memorizing vocabulary. These data indicate the need for new and varied teaching practices that differ from traditional classroom teaching methods and plans.

The literature review discusses various pedagogical approaches, such as the grammar translation method (GTM) and communicative language teaching (CLT). GTM is focused on rote learning and has been criticized for its ineffectiveness and lack of speaking and listening practices, which will lower their skills in communicating and comprehending (Wali et al., 2022). By analyzing the different questions asked and through a detailed review of the data, it was found that those participants who relied on rote learning and memorization were facing troubles with fluency and comprehension, which was evident from the response of Q4 (subjective question) and Q7 (comprehension of fast English) of the Likert-scale questions.

Communicative language teaching (CLT) emphasizes real-life communication and is based on those interactions from the teacher's side where the teacher is also an active character. These methods can improve fluency and comprehension. Taking a glimpse from the literature review emphasizes engaging in meaningful conversation and contextual learning, as explained by

Krashen (1981) and Rajeshwari (2020). The data from the questionnaire also suggests that students who reported higher usage of the English language outside schools and classrooms tended to perform better in comprehension and speaking skills.

This data established a need to shift from traditional teacher-centered classroom tasks to interactive student-centric classrooms. CLT and other interactive methods and plans will be better and more beneficial for ESL learners in a multilingual setup like India. There is a need for better and new teacher training programs that focus on improving the communicative and comprehension skills of the students. It also emphasizes the significance of using new technology to teach languages to students of India.

5.6.4 Socio-Cultural and Environmental Factors

The data from the questionnaire shows that the students from the semi-urban school background performed better than those from the school in a semi-rural environment. When answering Q7, which assessed their ability to comprehend fast English, 11.1% of school SH reported that they “never” found it easy to comprehend fast English. In contrast, the same proportion was only 6.8% in school SM. Also, for the following question to assess the ability to express themselves in the English language, 4.4% of SH students said they “never” find it easy to express themselves. In contrast, the same proportion was 6.8% in school SM. This disparity can be due to the different backgrounds in socio-cultural-economic spheres and the lack of exposure to the English language outside the classrooms and other indirect factors which also plays a role.

Mohanty (2017) and Agnihotri (2007) highlight the impact of socio-cultural and economic factors on language learning, particularly SLA. The study shows that proficiency in the English language can also create societal hierarchies, where there is only a low availability of resources in rural and semi-rural schools. This is evident in the data analysis of the questionnaire, which shows a division between the urban and rural schools.

Agnihotri (2007) establishes that it is better to consider multilingualism as a resource than as a disadvantage. He raises the idea of implementing fresh teaching strategies that take into account of the students' linguistic and cultural identities. In response to the study's third question, this paper argues for the significance of sociocultural, economic and environmental elements for ESL acquisition.

5.6.5 Age and Language Learning

The literature review discusses the critical period hypothesis (CPH) and role of age in SLA. The questionnaire does not directly shed light on this, and it gives insights into the students' challenges in grade 9. They are in a transitional period between childhood and adulthood. The data gives insight into the fact that, even though they started learning English formally at 3 or 4, some still have difficulty remembering grammar rules, vocabulary, and comprehension skills, which aligns with the previous studies. This suggests that older learners rely more on explicit learning practices and cannot achieve native-like proficiency (Yang, 2019; Xu, 2023). Yang (2019) argues that younger learners achieve native-like proficiency in pronunciation and grammar, while older learners may struggle with fluency and accent.

5.6.6 Multilingualism and Cognitive Demands

Upon assessing the questionnaire data, it is evident that the students face cognitive overload regarding grammar rules and vocabulary retention. This data aligns with the previous studies by King Chetty (2014) and Agnihotri (2014). In a multilingual setup like that of India, the students must learn multiple languages simultaneously, which may hinder second language acquisition. The data and the studies suggest that new and effective strategies are needed to manage the cognitive demands of children. King and Chetty (2014) discuss the benefits of code-switching in classrooms, stating that teachers can alternate between the target language and the mother tongue to explain the context and concepts. In school SH, in the semi-rural environment, most responded to the subjective question of difficulty speaking in English and comprehension. So, introducing a new pedagogical approach rooted in a multilingual setup can support disadvantaged students, which will help them reduce cognitive overload and improve second language acquisition.

5.7 Conclusion

Through analyzing the data collected from the questionnaire and drawing insights from the previous literature, a nuanced and practical understanding of the cognitive and pedagogical factors affecting the learning of English as a second language (ESL) in a multilingual context was arrived at. The findings emphasized memory, cognitive skills and developments, and practical and new pedagogical methods. Focusing on these aspects will help improve overall proficiency in the English language. This study and the previous research also underline the need to address socio-cultural-economic and environmental barriers better, particularly in rural

and semi-rural areas. These studies lay the foundation for further studies and research for implementing new practices for improving ESL and giving policy recommendations, mainly in multilingual setups.

As a conclusion for the discussion related to the data analysis, students in semi-rural areas face more significant language learning challenges due to various factors, including limited exposure to English, cognitive demands, and socio-economic inequality. To address these challenges, it is necessary to adopt new approaches and teaching and learning strategies that incorporate memory retention methods and ways to improve memory, interactive classrooms in which teachers and students are active characters and good socio-cultural support from the community.

These challenges can be mitigated by various activities, like engaging in meaningful conversation, using technology for language learning and gamification, and adopting teacher training programs in the context of multilingual pedagogical approaches and plans.

Overall, both the questionnaire and the literature review findings highlight the interplay between language, cognition, and teaching. It also shows the interplay between cognitive, pedagogical, and socio-cultural-economic factors that affect the SLA. Multiple studies have been conducted and are still being conducted; it helps to achieve an effective language learning environment and helps the learners achieve high proficiency in using and comprehending the English language. This study and this chapter contribute to developing new mechanisms that affect the SLA and to making practical methods for improving the outcome of learning a language.

Chapter 6

Conclusion

The study delves into the complex relationship between language, cognition, and teaching, particularly in learning English as a second language in a multilingual setup. The study was conducted among 89, 9th-graders from two schools in Kerala, India. This study has shed light on students' cognitive and pedagogical challenges in acquiring overall proficiency. The data analysis reveals the role played by memory in language learning. Students struggle to remember vocabulary and grammar rules, an essential factor affecting their ability to comprehend and express themselves in real-world conversations. The study also highlights the significance of socio-cultural and environmental factors on language learning, which is evident in the comparison between the two schools, which have different environments. The better performance of students in semi-urban spaces than in semi-rural spaces indicates the importance of real-world language practices. It can also be due to the lack of resources.

This research identified the major areas where the students' faced difficulties. Those include retention of grammar rules, vocabulary acquisition, and comprehension of fast-spoken English. These challenges are further deepened by traditional teaching methods like GTM, which emphasizes rote

learning over implicit learning. This study can advocate for a shift towards more interactive, student-centered approaches like CLT, which focus on real-life communication and using English depending on the context. The finding also suggests that overall proficiency can be improved using methods that enhance memory, like spaced repetition, visual aids and gamification, mnemonics, and others that can be incorporated into the curricula.

However, the study is not devoid of limitations. The sample size and the data may not fully and truly represent the diverse linguistic diversity in India. The study also depended upon the self-reported difficulties that can cause under or over-reporting difficulties. And the questionnaire is receptive rather than expressive. They just filled out the questionnaire form, no further training was given to them, and no post-test was administered later. Extending the sample size, expanding to a broader range of different schools, and longitudinal studies to track the student's progress over time and exploring the impact of nuanced and effective teacher training programs can be done in future studies.

The implication of this study can be extended beyond the classrooms and can help educators, researchers, and policymakers. Addressing the socio-cultural and environmental barriers to ESL learning and adopting a new and practical pedagogical approach can enhance the English language proficiency of students in multilingual setups. These changes can contribute to more educational and job opportunities and raise living standards. Improving the standard of living, especially in this globalized world where English is the key to connecting different people and cultures. The study concludes by emphasizing the need for further research into the interplay between language, cognition, and teaching. Future research can also use technology and AI to teach and learn English, and more studies are required to develop more effective language learning strategies to ensure that no one is left behind and help them reach their full potential.

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Appendix

Question 1: Unseen Passage

Read the following passage and answer the following questions by marking the correct answer in the checkbox.

Trees are often called the "lungs of the Earth" because they play a vital role in maintaining ecological balance. They absorb carbon dioxide and release oxygen, which is essential for the survival of most living organisms. Besides providing oxygen, trees offer shelter to countless species of animals, birds, and insects. Moreover, they help in reducing air pollution, conserving water, and preventing soil erosion. In urban areas, trees act as natural air conditioners by lowering temperatures and offering shade. Hence, planting and protecting trees is not just an environmental responsibility but also a necessity for human well-being.

a) What is the main idea of the passage?

- ☐ Trees are natural air conditioners.
- ☐ Trees prevent soil erosion and air pollution.
- ☐ Trees are crucial for ecological balance and human well-being.
- ☐ Trees provide shelter to animals and insects.

Answer) Trees are crucial for ecological balance and human well-being.

b) Which statement best summarises the author's argument?

- ☐ Trees are essential for maintaining oxygen levels on Earth.
- ☐ Trees contribute to the ecological and environmental health of the planet.
- ☐ Urban trees are more important than rural trees.
- ☐ Soil erosion and air pollution can only be prevented by planting trees.

Answer) Trees contribute to the ecological and environmental health of the planet.

c) The phrase "lungs of the Earth" refers to ____.

- ☐ The ability of trees to provide shade
- ☐ The role of trees in absorbing carbon dioxide and releasing oxygen
- ☐ The capacity of trees to prevent soil erosion
- ☐ The shelter that trees provide to animals and insects

Answer) The role of trees in absorbing carbon dioxide and releasing oxygen.

Question 2: Verbal Reasoning

Fill in the blanks or mark the correct answer in the checkbox.

a) Fill in the blanks:

Trees: Oxygen ; Fire: _____

☐ Smoke

☐ Water

Answer) Smoke

b) Birds: Nests ; Bees: _____

☐ Hives

☐ Leaves

Answer) Hives

Choose the correct answer from the options

a) Choose the synonym of the word "necessary" from the options below:

☐ Optional

☐ Essential

Answer) Essential

b) Choose the antonym of the word "protect" from the options below:

☐ Save

☐ Harm

Answer) Harm

Question 3: Grammar Questions

Identify the error in the sentence

a) "She don't likes ice cream because it is too sweet."

- ☐ She don't likes
- ☐ ice cream
- ☐ because it is
- ☐ too sweet

Answer) She don't likes

Explanation: The correct sentence is: "*She doesn't like ice cream because it is too sweet.*"

b) "The boy and the girl was playing in the park."

- ☐ The boy and the girl
- ☐ was playing
- ☐ in the park

Answer) was playing

Explanation: The correct sentence is: "*The boy and the girl were playing in the park.*"

Complete the sentence

a) "If I were you, I ____ take this opportunity."

- ☐ Will
- ☐ Would
- ☐ Can
- ☐ Should

Answer) Would

b) "She will visit us as soon as she ____ her work."

- ☐ Finishes

☐ Finished

☐ Finish

☐ Finishing

Answer) Finishes

1. Are you using English language outside school?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

2. Do you use English language while talking with English speaking people?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

3. Do you enjoy learning English language?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

4. Do you have any specific difficulty while learning English language?

5. Do you find it easy to remember English vocabulary?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

6. Do you find it easy to have good memory of English grammar rules?

Never	Rarely	Sometimes	Often	Always
-------	--------	-----------	-------	--------

7. Do you find it easy to comprehend when English is spoken quickly?

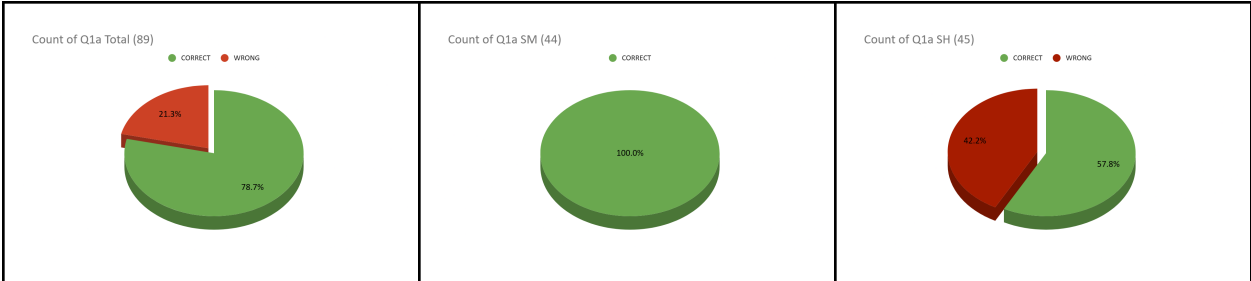
Never	Rarely	Sometimes	Often	Always
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8. Do you find it easy to express yourself in English?

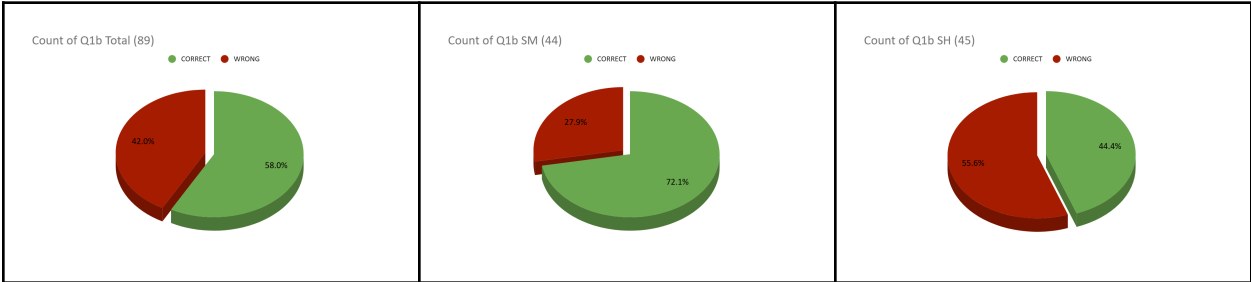
Never	Rarely	Sometimes	Often	Always
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Lists of graphs

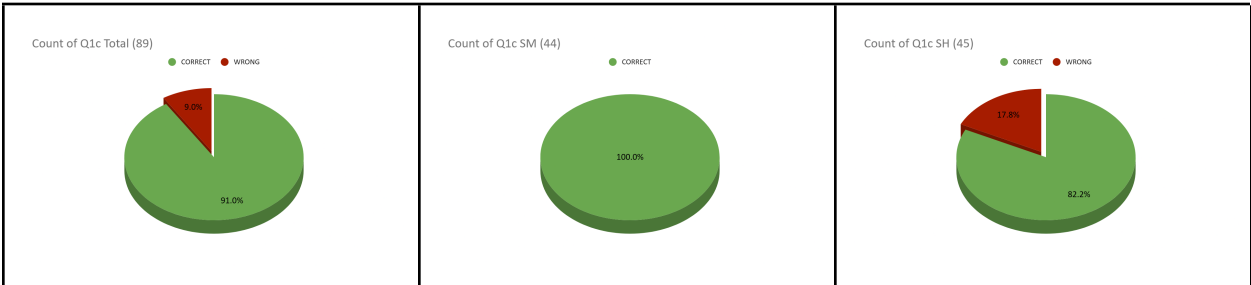
Q1a (Total, SM, SH)



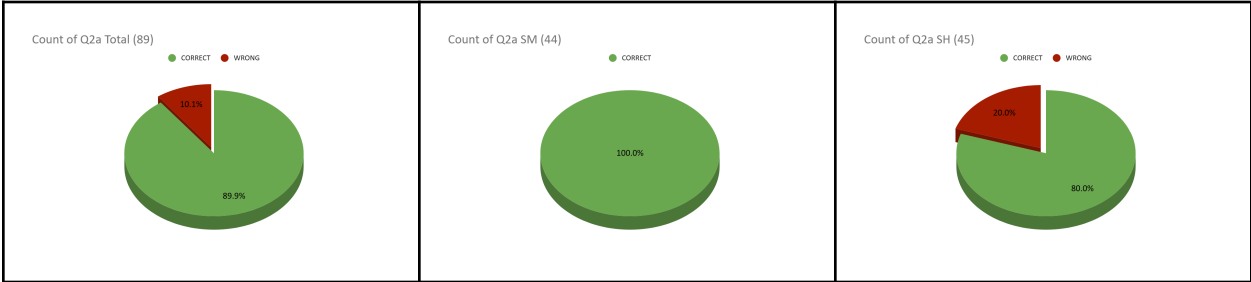
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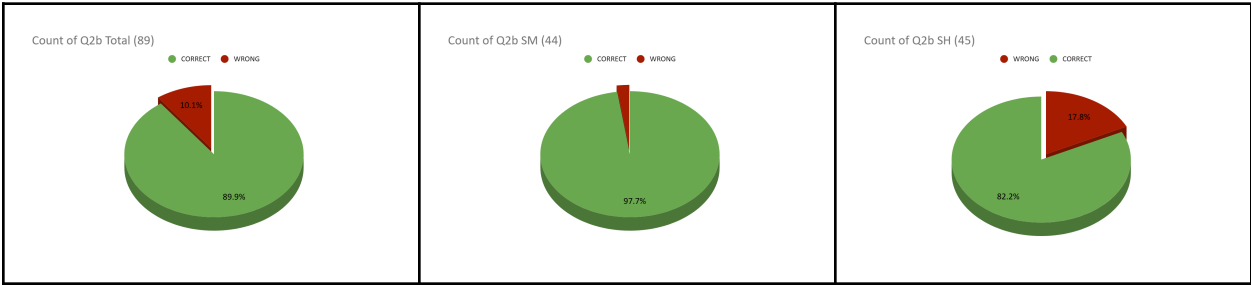
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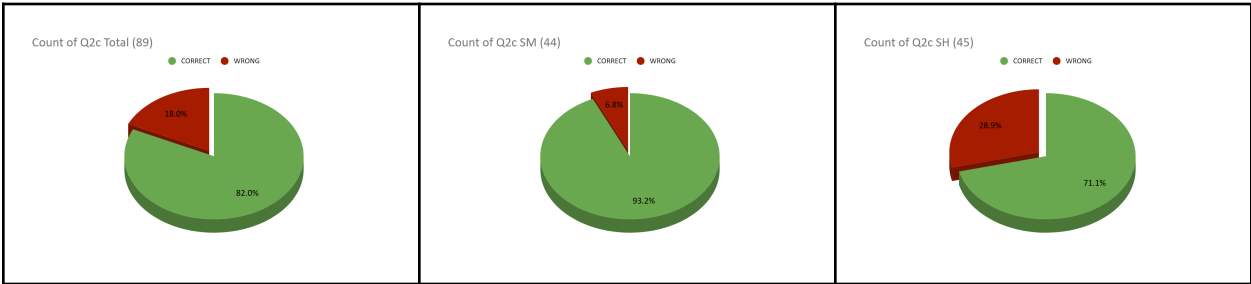
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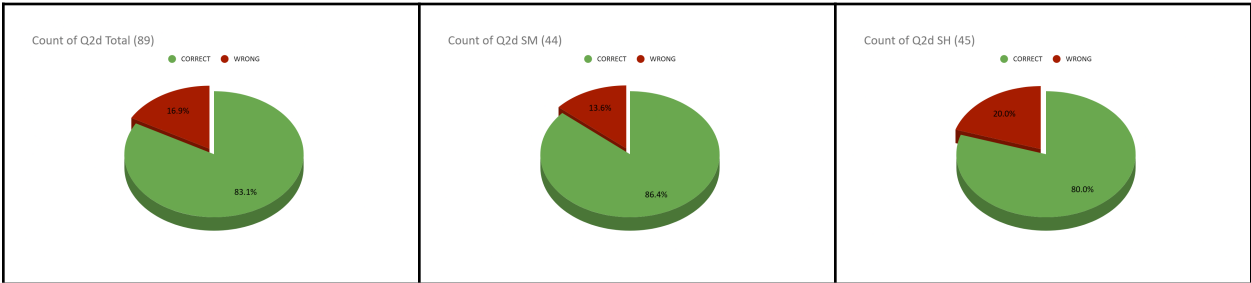
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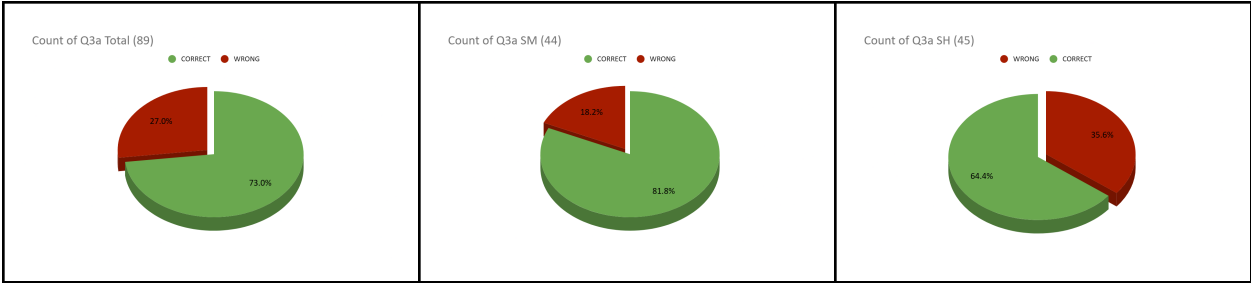
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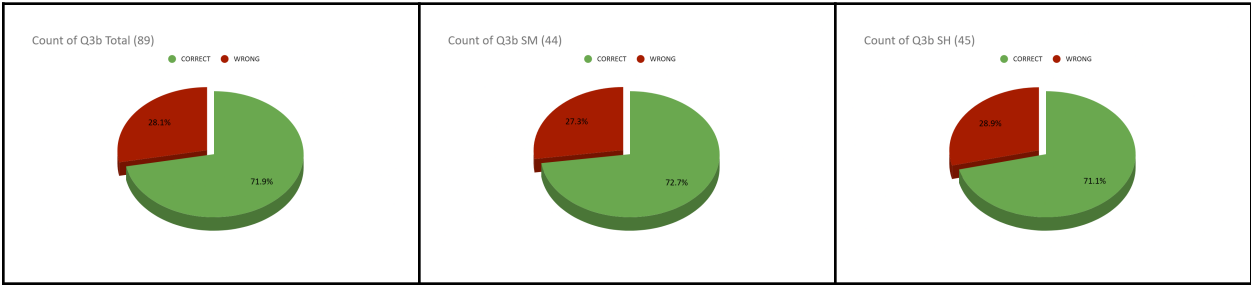
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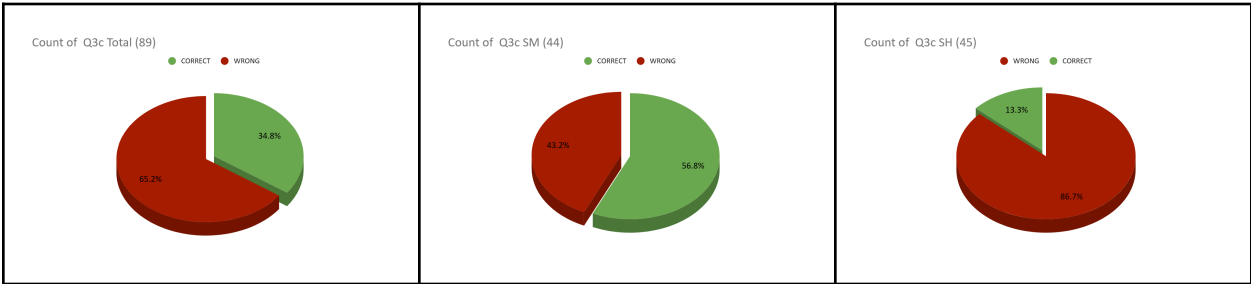
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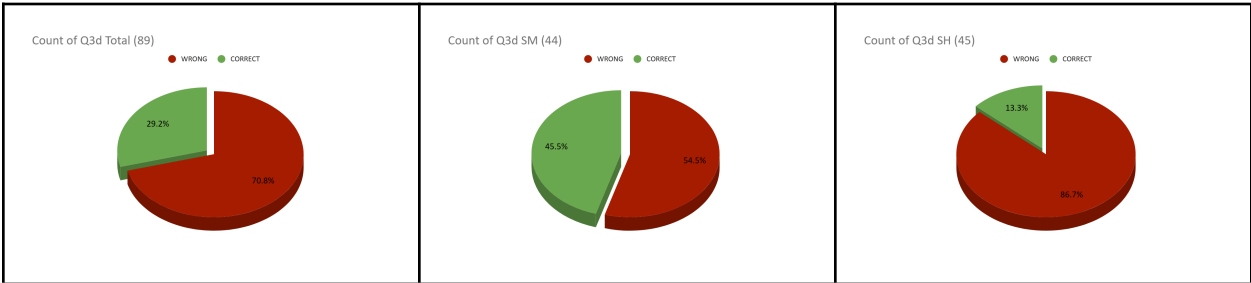
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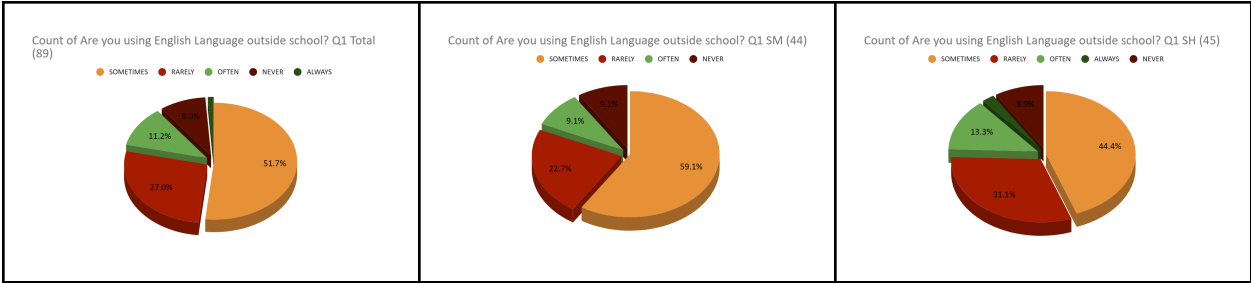
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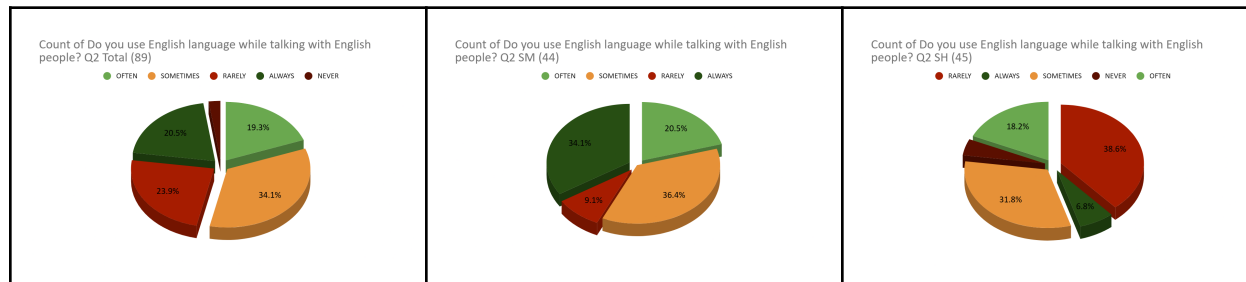
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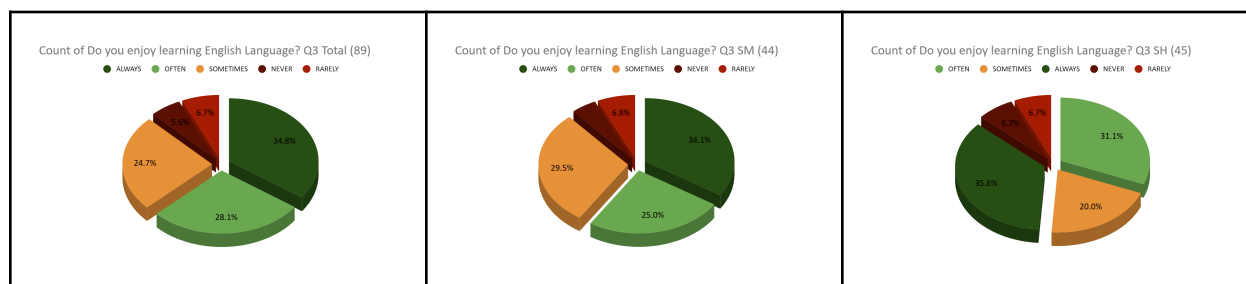
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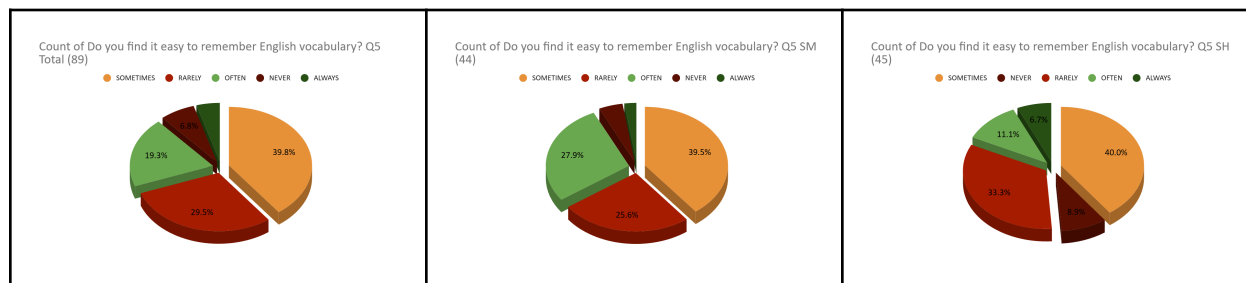
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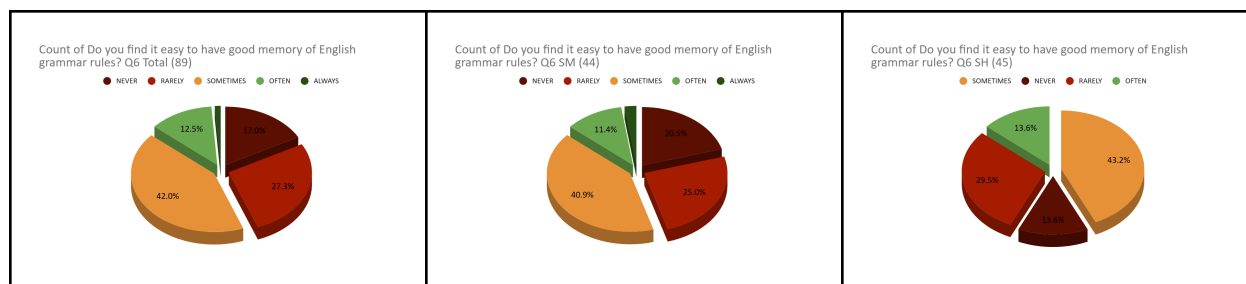
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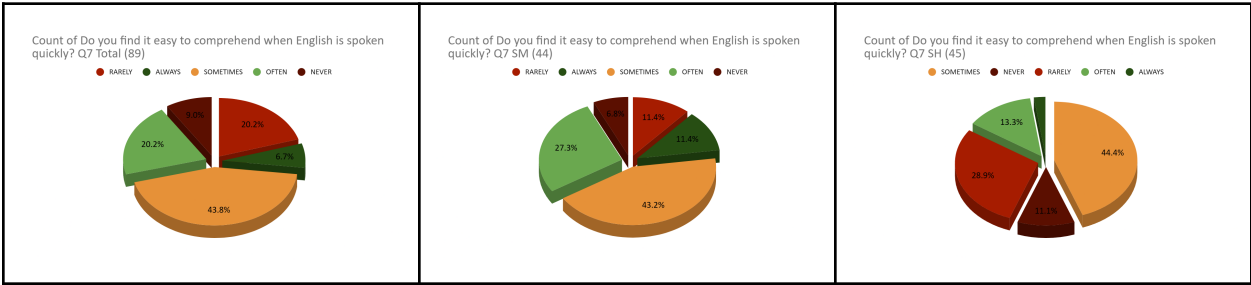
Q5 (Total, SM, SH)



Q6 (Total, SM, SH)



Q7 (Total, SM, SH)



Q8 (Total, SM, SH)

