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Knowledge Schemata of EFL Learners and its Influence on Reading Comprehension Skills

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Resumen

Esta síntesis de investigación tuvo como objetivo analizar los efectos de los esquemas de conocimiento (lingüísticos y de contenido) en las habilidades de comprensión lectora de los estudiantes de inglés como lengua extranjera. Para ello, se seleccionaron veinticinco estudios empíricos, escritos en inglés, con el fin de recopilar datos confiables. Este estudio tiene que ver con los siguientes temas: efectos del esquema activador (ventajas y desventajas o desafíos) y elementos de los esquemas (técnicas y rol del docente). Los resultados del análisis indican que el uso de la teoría de esquemas en un aula de inglés como lengua extranjera tiene un impacto positivo en la mejora de las habilidades de comprensión lectora. Además, se identificaron algunos desafíos al utilizar la teoría de esquemas. Asimismo, en este estudio se presentan recomendaciones e implicaciones pedagógicas.

Palabras clave del autor: teoría de esquemas, entendimiento, técnicas, conocimiento previo, esquemas de contenido, aulas de inglés como lengua extranjera



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Abstract

This research synthesis aimed to analyze the effects of knowledge schemata (linguistic and content) on the reading comprehension skills of EFL learners. For this purpose, twenty-five empirical studies, written in English were selected in order to collect reliable data. This study has to do with the following topics: effects of activating schema (advantages and disadvantages or challenges) and elements of schemata (techniques and teachers' role). The results from the analysis indicate that the use of schema theory in an EFL classroom has a positive impact on improving reading comprehension skills. Furthermore, some challenges of using schema theory were identified. Moreover, in this study recommendations and pedagogical implications are presented.

Keywords of the author: schema theory, understanding, techniques, prior knowledge, content schema, EFL classrooms



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Dedication

First of all, I would like to dedicate this project wholeheartedly to my parents, Luly and Darwin, for their inspiration and pillar of strength throughout this journey. Their unwavering support, encouragement, and belief in my abilities have been instrumental in achieving this milestone. Last, but not least, I dedicate this research paper to my dear friend Esperanza who since day one has always supported and encouraged me.

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Introduction

According to Al-Issa (2006), schema theory refers to the idea that every act of comprehension requires a certain level of prior knowledge. It creates complex networks of information that people use to construct and interpret stimuli, occurrences, and circumstances. Therefore, relating reading comprehension and schema theory may increase understanding between the reader's schema and the information in the text. Furthermore, the previous author mentioned that using schema is the foundation for comprehension; it refers to the ability to connect the unknown to what students already know.

Nevertheless, applying schema theory is a challenging task as stated by Li and Zang (2016) since it involves the subdivisions of schemata (cultural, knowledge, and linguistic schema) and working together with them in order to create a successful reading experience. Hence, activating different kinds of schemata requires considering different inverse factors in its application. Consequently, this research synthesis aims to analyze the effects of using knowledge schemata (schema theory) on the reading comprehension skills of EFL learners.

This research synthesis is organized into five chapters. The first chapter gives a general view of the research including a description of the background, problem statement, rationale, the research questions, and the objectives of the study. The second chapter covers the theoretical framework, which includes important concepts such as schema theory, principles of schema theory, linguistic schema, and content schema. This chapter also discusses the literature review, which includes an overview of the research that has been carried out in the area of schema theory and its effects on reading comprehension. The methodology, which describes how the research was carried out and the inclusion of the criteria for choosing the studies, is covered in the third chapter. The fourth chapter details the data analysis of the selected studies, which are categorized into four groups, which help address the research question and achieve the objectives. Finally, the fifth chapter presents the conclusions and recommendations of this research synthesis.

Chapter I

Description of the Study

Background

An EFL classroom is a place full of students who come from different realities and contexts. So, it is essential to consider students' schemata (structured background knowledge) for learning English efficiently (Khataee et al., 2018). As this term is the foundation for this work, it is necessary to define it. In the words of Alhaisoni (2017), the schema is an active arrangement of previous responses to previous experiences, which is always intended to be operative in any well-adapted response. Furthermore, according to Al-Jahwari and Al-Humaidi (2015), readers use the knowledge stored in their schemata (background knowledge) to understand or infer implicit information when the content is familiar to them.

Bensalah and Gueroudj (2020) argued that the schema theory has a significant impact on improving reading skills. Hence, it aids in text comprehension and interpretation of a text by allowing the reader to form expectations about the content and interpret it in the correct way. In addition, Piaget's well-known hypothesis mentions that comprehending something is the process of accommodating and assimilating new information while integrating prior knowledge. Therefore, in the understanding process, having schema knowledge of the subject is just as important as having current information.

Al-Salmi (2011) has reported that schema theory has significantly impacted how readers comprehend a text. In this way, the method through which readers use information in a text along with their prior knowledge to understand that text is described by schema theory. Also, every reader has unique schemata that are frequently culture-focused (Al-Salmi, 2011). Furthermore, the author has reported three main types of schemata. These are linguistic (vocabulary, grammar, idioms, etc.), formal (organizational forms and rhetorical structures), and content (social and cultural); all of them are indispensable for the improvement and development of reading comprehension. However, it is necessary to mention that the focus of this study will be the analysis of linguistic and content schemata.

Hence, understanding what is written on the page is simply one aspect of reading comprehension; another is building meaning by fusing what is written with schema knowledge that the reader already has. Thus, the reader must draw on his/her previous knowledge to fully comprehend a text (Al-Salmi, 2011).

Then, it is a fact that knowledge schemata are closely related to the development of reading comprehension of English skills. Additionally, Burgoyne et al. (2009) argued that the ability of reading comprehension is multifaceted and involves a variety of cognitive processes at various levels. Hence, in the study conducted by the same author, findings showed that

comprehension is closely related to the level of previous knowledge (poor or rich vocabulary).

With similar results, a study carried out by Al-Jarrah and Ismail (2018) has shown that 34.7% of participants answered correctly since their previous knowledge helped them comprehend the text. Furthermore, extensive reading is an important part of language development because it can increase background knowledge and reading rate, both of which help reading comprehension (Chou, 2011).

Related to the idea that knowledge schemata influence the development of reading comprehension skills, it is crucial to emphasize the significant relationship between prior knowledge and the reading performance of second or foreign-language students (Jamalipour & Farahani, 2015). Also, these authors have pointed out the importance of considering the prior knowledge that readers bring to the text to understand its different content.

Statement of the Problem

According to Barría et al. (2019), learning a second language is a socio-cognitive process that involves similar factors as learning a first language. These factors are adaptation (interrelation) or social action-for-survival (personal situations), and the environment (setting where the language is developed). As it is explained in this study, part of this socio-cognitive process highlights the importance of considering previous knowledge to establish a context in which EFL learners can interact.

Al-Jarrah and Ismail (2018) mentioned that knowledge schema is one of the necessary strategies for achieving reading comprehension. Also, the authors stated that the lack of previous knowledge can have a detrimental effect because it plays a dynamic role in text comprehension. Similarly, Moncada (2013) has stated that it is primordial to give learners a period of preparation for the construction of the meaning according to their previous experiences for the correct understanding of a text through printed material.

Teachers sometimes do not consider the knowledge schemata of students, resulting in an impediment to developing reading comprehension skills. This statement is validated by Al-Jahwari and Al-Humaidi (2015), who have found that although the Omani EFL teachers (participants of this study) may be aware of the significance of prior knowledge in reading comprehension, they are not aware of its educational implications. In addition, the authors found that insufficient training of teachers is a problem since they do not know a range of methods and techniques for bringing pupils' prior knowledge to the forefront.

Then, it is evident that knowledge schemata have a great influence on the development of reading comprehension skills. However, based on our experience as students and observers, knowledge schemata seem not to be considered by teachers for developing or

practicing reading comprehension. It may occur because teachers focus on giving isolated content during the class; that is, they are not aware of how familiar students are with the subject in the cognitive part or in the cultural elements that a text has (Moncada, 2013). Therefore, considering the background knowledge of students could help teachers to be aware of what learners bring to the class.

Although there are studies about knowledge schemata and language learning, there is scarce information that synthesizes the effects of taking into consideration students' prior knowledge and its impact on their reading comprehension skills. Hence the purpose of this research synthesis is to analyze the effects of knowledge schemata on EFL learners' reading comprehension skills.

Rationale

Teaching EFL involves the earlier understanding of students as it is not just a matter of providing learners with content. Moreover, according to the seminal work of Bartlett (1932), the foundation of schemata establishes that knowledge schema is one of the crucial principles for comprehending a language.

Consequently, it is important to take into account prior knowledge since it has a great impact on reading comprehension. In fact, McKay (2018) has found that learners' understanding depends on their previous schemata. In the same study, the author mentioned that reading is an interactive process between the learners' background (content or formal) and the text. Similarly, Al-Asmari and Javid (2018) have found that considering the background knowledge of EFL learners represents a great advantage for them since learners will have a better understanding of the text. Hence, the schemata affect memory, perception, thought, and interpretation, which are the elements that intervene in reading comprehension. In this way, Bartlett's schema theory emphasizes the need to have previous knowledge and schema for text comprehension. Thus, the schema theory explains the significance of prior information in language comprehension and provides examples of how readers might reconstruct meaning from prior knowledge based on their pre-existing experience.

In contrast, Zhao and Zhu (2012) have mentioned that learners tend to understand a text according to what they already have stored in their memories. Unfortunately, this fact could represent a big problem in reading comprehension skills since EFL learners could have stored incorrect information or overgeneralized what they already know from their L1. Al-Salmi (2011) has argued that schema-theoretic applications do not always lead to better understanding, especially when readers pay less attention to textual details or when there is a rise in schema interference.

As can be seen, there is a significant relationship between prior knowledge and reading comprehension skills of EFL readers. According to Ghorbandordinejad and Bayat (2014),

using readers' prior knowledge greatly benefits developing reading skills since EFL learners' familiar previous experiences are valuable and indispensable to their reading comprehension. However, a negative schema can lead students to misinterpret or misunderstand a text.

We will conduct a research synthesis in order to report the effects of knowledge schemata on reading comprehension skills. A research synthesis was chosen since Wyborn et al. (2018) mentioned that it is the most suitable option which allows integrating previously collected data and findings to develop and fill a research gap and formulate future research proposals.

Research Questions

- Q1. What are the reported effects of knowledge schemata on the reading comprehension of EFL learners?
- Q2: Which reported elements of knowledge schemata have intervened in the development of reading comprehension skills?

Objectives

General Objective:

- To analyze the effects of knowledge schemata (linguistic and cultural) on reading comprehension skills of EFL learners.

Specific Objective:

- To describe the elements of knowledge schemata that intervened in the development of reading comprehension skills.

Chapter II

Theoretical Framework and Literature Review

2.1. Theoretical Framework

In this section, pertinent terms and definitions will be presented in order to help our readers comprehend the topic and support the context of the study. Therefore, this chapter provides information on schema theory, principles of schema, linguistic schemata, content schemata (cultural schemata), and their relationship with reading comprehension skills.

2.1.1 Schema Theory

According to Al-Issa (2006), the knowledge acquisition theory, processing, and retrieval is called schema theory. Then, cognitive scientists use the technical term *schema* to refer to the method of processing, organizing, and storing information. In addition, the British Gestalt psychologist, Sir Frederic Bartlett, *schema* refers to “an active organization of past reactions, or past experiences, which must always be operating in any well-adopted organic response” (Bartlett, 1932, p. 201).

Furthermore, according to the co-founders of the term *schema*, Anderson and Pearson, the schema is a structure for abstract knowledge. It is abstract in condensing what is known about several cases that vary greatly in their specifics. It is organized in that it shows how its constituent pieces relate (Zhao & Zhu, 2012).

Then, relating schema to reading comprehension skills, Al-Jahwari and Al-Humaidi (2015) mentioned that knowing how schema functions during the reading process helps explain why some students struggle and others thrive in grasping the reading material. Also, these authors claimed that the readers deduce implicit information using textual cues and the information stored in their schema.

2.1.2. Principles of Schema Theory

According to Plant and Stanton (2013), Schema Theory's primary tenet is the understanding that individuals experiencing cultural, professional, or social differences lead to diverse schemata, which in turn cause various actions and behaviors. It is necessary to consider that a written text is just a guide used by readers to give them different clues for understanding and interpreting the text using the reader's previous knowledge.

Furthermore, Carrell and Eisterhold (1983) and Kashani Mahmood et al. (2013) proposed another principle that explains how the interpretation process and schema work together to create an understandable message of a text. Based on this previous statement, it is essential to highlight that all new information (input) that readers receive should be compatible with the information they already have. Also, this principle results in two basic modes of information process, which are bottom-up and top-down processing (Carrell & Eisterhold, 1983; Kashani Mahmood et al., 2013).

According to Ma (2021), bottom-up processing or data-driven refers to the process that allows readers to understand the whole content of the text by focusing first on the smallest grammatical units of speech in order to create a perception. It refers to processing information in the text from its words through its sentences to its paragraphs to find specific information. Thus, this reading mode is appropriate for detailed reading and learners must correctly understand the detailed material.

Top-down processing, also known as conceptually-driven processing, happens when the system develops broad predictions based on higher-level, generic schemata and then looks for information in the input (Carrell & Eisterhold, 1983). According to Ma (2021), the goal of the top-down mode is to comprehend the main idea of the text from a broad, macro viewpoint. Thus, learners do not have to read the text word for word (not too many details). Hence, if they can understand its primary idea even with new terminology and unfamiliar grammar, they can skip the unknown words and new grammar structures.

2.1.3. Types of Schemata

According to Zhang (2016), the schema is very important and influences reading comprehension significantly since it can assist readers in understanding not just words and sentences but also the major idea of the text. Therefore, the author explains that reading comprehension is a process of combining readers' schema knowledge with the text.

Moreover, Li and Zang (2016) claimed that knowledge schemata involve different kinds of schema which are linguistic and content schema. In the same vein, the previous authors claimed that these types of schemata cannot work separately. However, some authors stated that one kind of schema can be more dominant over another; it just depends on the background of learners (Bensalah & Guerroudj, 2020; Li & Zang, 2016).

2.1.3.1. Linguistic Schemata

The term linguistic schema describes vocabulary, expressions, and syntax understanding. It is fundamental to completely comprehend the content of the text (An, 2013). Similarly, Li et al. (2007) consider that the vocabulary, grammar, and idioms that readers already know are referred to as their linguistic schemata. They serve as the basis for further schemata. Then, activating linguistic schemata in learners involves decoding and understanding a text. As a result, they will learn the material more quickly and comprehend it better using a larger mental linguistic schema related to language.

2.1.3.2. Content Schemata

According to An (2013), *content schema* includes conceptual knowledge or data about specific occurrences within a given topic and how they connect to produce a cohesive whole. This kind of schema is also concerned with the content subject or topic of the text. Hence, familiarity, cultural understanding, and prior experience with a subject are part of the content schema. Consequently, language is not considered just a union of vocabulary, sentences, and grammar, but it is related to the variety of the background languages and the factors that influence them. Therefore, readers can understand the text by making a relation between their previous knowledge and the content of the reading. Something positive about developing content schemata is that it can help to mend the lack of linguistic schemata since readers can predict, choose information, and remove ambiguities (Al-Salmi, 2011).

2.1.3.2.1. Cultural Schemata

According to Gao (2021), "cultural schema theory provides a constructive scaffold" for the awareness of developing new cultural schemas while learning the target language and culture (p. 6). It also allows students to create definitions of how they perceive "meta-cultural communication" and all particular cultures (p. 6). Likewise, the understanding of cultural experiences connected to the material is known as content schema. Ma (2021) and Zhang (2016) established that there are situations where students read the content without understanding the underlying language, and they are also still unable to comprehend the paragraph. The aforementioned statement is the result of not having a content plan or using the correct strategies. As a consequence, to fully understand a text, one must engage with and consider pre-existing cultural knowledge, materials, and techniques (Ma, 2021; Zhang, 2016).

2.2. Literature Review

According to Ali (2016), schema theory refers to how knowledge is organized into units and where the brain stores prior experiences and previously acquired knowledge to assimilate new information. For this reason, schema theory is crucial for improving learners' reading skills, and its implementation in EFL classrooms profoundly could mean a considerable improvement in reading skills. This literature review presents the effects of schema theory (previous knowledge) on the reading comprehension of EFL learners, and it is divided into 5 sections: benefits of using schema theory in EFL learners, the role of the teacher using schema theory, teachers' perception regarding schema theory, level of knowledge and proficiency, and schema theory and other strategies.

2.2.1. Benefits of Using Schema Theory in EFL Learners

Schema describes how the brain reflects and retains information from prior experiences, a process where fresh information interacts with previously stored information (Li & Zhang, 2016). Based on this previous statement, some authors have conducted research to demonstrate that schema plays a significant role in improving reading comprehension skills and creating good reading habits. Furthermore, the authors reported that students who activate schema can fully comprehend the information in a text easily. Findings have shown that the first step toward comprehension is to activate learners' prior knowledge. Because of this, using pre-reading and while-reading exercises helps students get more familiarized with the content of the text and improves their reading comprehension. Post-reading tasks allow readers to confirm and elucidate any ambiguities in the final stage (Bensalah & Guerroudj, 2020; Che, 2014; Dehghan & Sadighi, 2011; Zhao & Zhu, 2012).

In addition, Al Ghafri et al. (2020) have reported that as learners gain more knowledge about the world, especially as they specialize in it, their schemas become increasingly complex. According to these authors, it could represent a difficulty in activating schema; however, it does not prevent its usage if it is used and activated correctly. A variety of techniques, including previewing, visual aids, and warm-up exercises, can be used to achieve this.

2.2.2. The Role of the Teacher

Kashani Mahmood et al. (2013) concluded that an active EFL/ESL (English as a Second Language) teaching strategy is the interactive reading processing technique built on schema theory. It emphasizes how students and teachers interact in the classroom. Thus, the authors suggested that educators should stimulate their students' reading-related learning motivation. Furthermore, teachers need to demonstrate any model of instruction before reading so that pupils may activate their prior knowledge and interact with the text from the book.

Al-Jahwari and Al-Humaidi (2015) and Mills (2019) found other roles for instructors focused on using schema to improve reading fluency and comprehension. Teachers must help pupils become proficient readers by training them to utilize and activate their existing knowledge and interconnect information. Therefore, teachers should employ creative, interpretive, problem-solving techniques that let pupils draw on whatever background information or resources they possess to help readers activate their existing knowledge.

Additionally, Zhang (2016) suggested that teachers may give students a variety of assignments, including finding prior knowledge, having group discussions, practicing their prediction skills, examining the structure, responding to questions, summarizing, and acting out various reading levels. The pupils' ability to read well has been firmly established by these strategies, which will eventually lead students to use them on their own when reading new texts.

2.2.3. Teachers' Perceptions Regarding Schema Theory

According to Alhaisoni (2017), teachers who comprehend the theoretical foundations of instructional methods (schema) are more equipped to choose and adapt interventions to better address the diverse needs of students. The author highlighted that in schema theory, the reader's background information is important to properly grasp the meaning of a text. In this study, the author found that when schema theory is activated, teachers note that their pupils read and comprehend the text more effectively, can quickly recall earlier information, and make connections between the reading material and their experiences.

In the same manner, Al-Asmari and Javid (2018) and Huyen and Trang (2020) have reported that most of the participants (teachers) have a positive view of activating schema to better comprehend a text. The findings of these papers have suggested that using different activities to activate schema is the most effective way to allow students to easily understand a message of a text. However, Al-Asmari and Javid (2018) have emphasized that having a low dominance of language prevents teachers from activating schemata. So, the participants of this study consider that the level of the language involves a challenge when activating schema.

2.2.4. Influence of Level of Knowledge and Proficiency

Activating schema is not an easy task: it involves considering different factors of students. Ghorbandordinejad and Bayat (2014) presented a study focused on demonstrating that the use of schema theory could help to master English reading skills. Findings showed that instruction in cross-cultural background knowledge (schema) significantly impacts the reading proficiency of Iranian female EFL students; put differently, enhancing cross-cultural understanding would help and facilitate reading comprehension.

Similarly, some authors mentioned that learners who already have a certain level of knowledge or familiarity with a topic can better understand a text (Liu, 2015; Smith et al., 2021). In addition, the authors found that when learners were provided with a high degree of previous information, readers with a lower background knowledge seemed to better comprehend and decode a text; however, weaker readers who did not have any background could slightly offset their relatively poor reading skills (Liu, 2015; Smith et al., 2021).

Besides, Abdelaal and Sase (2014), Deshpande (2016), and Pei-shi (2012) showed that there is a high correlation between reading comprehension and prior knowledge. The authors exhibited that excellent reading comprehension is the result of high prior knowledge. In other words, a high level of prior knowledge is necessary to score well in reading comprehension. Nevertheless, if the reader is exceptionally proficient in the language, then having less prior knowledge does not necessarily mean having a deficient performance. Furthermore, findings indicated that higher language proficiency participants possessed sufficient language knowledge to compensate for their lack of background information (Abdelaal & Sase, 2014; Deshpande, 2016; Pei-shi, 2012).

2.2.5. Schema Theory and its Relationship with Other Strategies for Improving Reading

The relationship between schema theory and reading comprehension is considered an interactive process in which the readers interact with a text to reconstruct meaning by utilizing their past knowledge (Al Ghafri et al., 2020; Jahangard et al., 2012). Moreover, Zarei and Mahmudi (2012) found that any type of schema-building activity helps to improve reading comprehension in an EFL context.

According to Jahangard et al. (2012), teaching vocabulary in the pre-reading activity gave more benefits to students than teaching grammar to comprehend a text. On the contrary, Hamid et al. (2020) found that teaching grammar is an effective technique for EFL students' comprehension processing. Then, pupils' reading comprehension improves with increased grammatical proficiency. In both studies, the linguistic schema allows activating students' background knowledge appropriately in understanding the different English reading texts. Additionally, the results of another study also evidenced that students mostly used their linguistic schema in understanding the reading text (Ekasary et al., 2022).

Park and Kang (2018) observed that content schema and prediction abilities are correlated with students' reading understanding and with two other categories of comprehension abilities: factual and inferential knowledge of a text. Nevertheless, the results of the same article evidenced that for Korean middle school EFL learners, prediction ability appears to be more significant than content schema in helping them to draw conclusions and comprehend the literal meanings of the text.

Finally, brainstorming has also been considered a strategy to activate students' previous knowledge to comprehend a reading passage in activities at the pre-reading stage (Al-Jahwari & Al-Humaidi, 2015; Al-Asmari & Javid, 2018; Zhao & Zhu, 2012). However, Al-Jahwari and Al-Humaidi (2015) noted that teachers did not use brainstorming efficiently since they did not spend more than two minutes to elicit specific information about the topic from their students. Additionally, teachers agreed to use this strategy because it does not need much preparation and can be done easily before any lesson. Instead, these authors recommended other strategies such as audiovisual aids (pictures, posters, guessing, and prediction), and others more complex (semantic mapping, advance organizer, and anticipation guide).

Chapter III

Methodology

According to Weng, Zhu, and Kim (2019), research synthesis is a framework for looking into and methodically analyzing prior results while constantly outlining the review's approach. For this research synthesis, we used different academic sites such as Google Scholar, Eric, and Scielo to search for valuable studies to develop this work. It was also vital to select some terms that helped us to find the studies 1. schemata background, 2. schema/ schemata, 3. prior knowledge, 4. reading comprehension skills, 5. EFL, 6. understanding, 7. text, 8. content schema, 9. linguistic-cognitive knowledge, 10. activation of knowledge, 11. techniques. For this research synthesis, different studies were included without considering the specific place where the studies were developed, the methodology used, and the learners' English level. Also, different digital sites were used to carry out this research synthesis since it was complicated to obtain physical sources.

To develop this research synthesis, we took into account different criteria for including studies in the analysis. In the first place, the studies were empirical to have a real and reliable vision of the influence of knowledge schemata on the reading comprehension skills of EFL students. Second, we considered articles published from 2009 to the current year; in this way, the collected literature was relevant and our analysis was focused on studies closer to our time. Finally, we analyzed studies in English and Spanish since the authors of this work are bilingual.

We considered articles published in the following journals: *Research Journal Specific Education*, *Canadian Center of Science and Education*, *International Journal of English Linguistics*, *RELC Journal*, *English Language Teaching*, *International Journal of Applied Linguistics and English Literature*, *Administration of Education Taif English Language Supervisor*, *British Journal of Educational Psychology*, and *Asian Journal of Teaching and Learning in Higher Education (AJTLHE)*, among others. In these sources, we found relevant studies during our preliminary research. Once the data were collected, they were analyzed and classified according to the themes or categories that emerged during the analysis itself.

CHAPTER IV

Data Analysis

In this chapter, the 25 collected studies were analyzed to answer the research questions stated in the first chapter. These articles were grouped into the following categories: Geographical area, level of instruction of the participants of the studies, the positive effects or advantages of activating schemata, the negative effects or challenges of activating schemata, and the elements of using schema theory (different techniques for activating previous knowledge, and the role of the teacher when using schema theory).

It is important to mention that the first and second categories portrayed in Tables 1 and 2 do not respond to our research questions directly; however, they provide the reader with an overview of the specific continents where schema theory has/ has not yet been studied and the different educational stages in which schema theory has been studied.

4.1. Geographical Area**Table 1*****Geographical Area***

Geographical Area	Author/Year	Nº of Studies	%
Africa	Bensalah & Guerroudj (2020)	1	4%
America	Mills (2019)	1	4%
Asia	Abdelaal & Sase (2014); Al Asmari & Javid (2018); Al Ghafri et al. (2020); Alhaisoni (2017); Ali (2016); Al Jahwari and Al-Humaidi (2015); Che (2014); Dehghan & Sadighi (2011); Deshpande (2016); Ekasary et al. (2022); Ghorbandordinejad & Bayat (2014); Hamid et al. (2020); Huyen & Trang (2020); Jahangard et al. (2012); Kashani Mahmood et al. (2013); Li & Zang (2016); Liu (2015); Park & Kang (2018); Pei-shi (2012); Zarei & Mahmudi (2012); Zhao & Zhu (2012); Zhang (2016)	22	88%

Oceania	Smith et al. (2021)	1	4%
Europe		0	0%

N= 25

Table 1 exhibits an analysis focused on geographical areas to provide a general view of research on this topic worldwide. The results indicate that most studies (88%) about knowledge schemata and its influence on reading comprehension skills were conducted in Asia. Moreover, considering this tendency, it can be assumed that schema theory has a significant relevance in Asian countries. According to Dehghan and Sadighi (2011), Jahangard et al. (2012), and Zhang (2016), there are reading methods that are widely used in the Asian context and have an important position in many teachers' minds during the teaching process.

Hence, even if schema theory is broadly known and studied in Asian countries, there is a gap since teachers do not include and combine all kinds of schema in their English classrooms (Dehghan & Sadighi, 2011; Jahangard et al., 2012; Zhang, 2016). Furthermore, research about schemata carried out in this continent demonstrates the importance of reading for both L1 and L2 reading comprehension skills (Dehghan, 2011; Pei-shi 2012; Zarei & Mahmudi 2012). Moreover, these researchers found few studies exploring how EFL teachers understand and apply prior knowledge in teaching reading.

On the one hand, 12% of studies correspond to the data obtained from Africa (Tialet), America (U.S.), and Oceania (Australia); in this case, 4% correspond to each continent, respectively. On the other hand, studies conducted in Europe or Latin America were not found. Therefore, it is noticeable the necessity of obtaining more data in our context.

4.2. Levels of Instruction of the Participants of the Studies

The following table shows information about the different levels of instruction of the participants in the analyzed articles. For purposes of this study, we just consider students as participants.

Table 2

Educational Stages of Participants Studied in Schema Theory

Authors /Year	Educational Stages	N
Mills (2019); Park & Kang (2018); Smith et al. (2021)	school (primary level)	3

Che (2014); Li & Zang (2016); Zarei & Mahmudi (2012)	high school (secondary level)	3
Abdelaal & Sase (2014); Al Ghafri et al. (2020); Ali (2016); Bensalah & Guerroudj (2020); Dehghan & Sadighi (2011); Deshpande (2016); Ekasary et al. (2022); Ghorbandordinejad & Bayat (2014); Hamid et al. (2020); Jahangard et al. (2012); Kashani Mahmood et al. (2013); Liu (2015); Pei-shi (2012); Zarei & Mahmudi (2012)*; Zhang (2016); Zhao & Zhu (2012)	university (tertiary level)	16

N= 21

***Note:** This study fits into more than one category.

According to Table 2, most of the studies were carried out with university students of a range of 18 years old and above (Abdelaal & Sase, 2014; Al Ghafri et al., 2020; Ali, 2016; Bensalah & Guerroudj, 2020; Dehghan & Sadighi, 2011; Deshpande, 2016; Ekasary et al., 2022; Ghorbandordinejad & Bayat, 2014; Hamid et al., 2020; Jahangard et al., 2012; Kashani Mahmood et al., 2013; Liu, 2015; Pei-shi, 2012; Zarei & Mahmudi, 2012; Zhang, 2016; Zhao & Zhu, 2012). Thus, a few articles analyzed the use of schema theory on kids and adolescents under 17 years old. To be more specific, just six studies from 21 were applied to children of primary and secondary levels (Che, 2014; Li & Zang, 2016; Mills, 2019; Park & Kang, 2018; Smith et al., 2021; Zarei & Mahmudi, 2012). In this regard, it is noticeable that most of the information in this research synthesis is valuable and useful to apply to university learners. Therefore, the following advantages, disadvantages, strategies/techniques, and roles reported might not apply to teaching children.

Once we have provided a general view of the places where schema theory has been studied and the learners who have been part of the analysis in the collected articles, we present the following categories that answer our research questions.

4.3. Effects of Activating Schemata

The following section provides information on the effects of using schema theory. That is, how schema theory contributes positively to learners' reading comprehension skills (advantages or positive effects) and how it prevents or makes difficult the implementation of schema theory in EFL classrooms (negative or challenging reported aspects).

4.3.1 Advantages or Positive Effects of Schema Theory on Reading Comprehension

Table 3

Advantages of Schema Theory

Author/Year	Advantages	N	%
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Abdelaal & Sase (2014); Al Asmari & Javid (2018); Ali (2016); Bensalah & Guerroudj (2020); Jahangard et al. (2012); Kashani Mahmood et al. (2013); Li & Zang (2016); Zhao & Zhu (2012)	An improvement in reading abilities and interactive reading classes	8	57%
Al Ghafri et al. (2020); Dehghan & Sadighi (2011); Pei-shi (2012); Zarei & Mahmudi (2012)	Connection of real-life situations with the content of the reading material	4	29%
Che (2014); Ghorbandordinejad & Bayat (2014)	Saving time when reading and motivating students to read	2	14%

N = 14

Table 3 indicates the advantages of using schema theory and how it contributes to achieving a successful reading experience. There are three main advantages which are the improvement of reading ability and interactive reading classes, connection of real-life situations with the content of the reading material and saving time when reading and motivating students to read.

The first advantage involves several factors to achieve an improvement in reading ability. Moreover, as Kashani Mahmood et al. (2013) have stated, schema theory provides pupils with tools that help them to have a good reading experience. For example, if the reader has developed all the schemata, he/she can use any of them when reading; as a result, there is growth and change in the student's performance as new information is acquired. In addition, schema theory helps to have better interaction between teachers and students (Abdelaal & Sase, 2014; Al Asmari & Javid, 2018; Ali, 2016; Bensalah & Guerroudj, 2020; Jahangard et al., 2012; Kashani Mahmood et al., 2013; Li & Zang, 2016; Zhao & Zhu, 2012).

The second advantage implies the connection of real-life situations with the content of the reading material. According to Al Ghafri et al. (2020) and Kashani Mahmood et al. (2013), schema theory is a key component of reading comprehension; for this reason, the reader must anticipate and understand the meaning of the words and phrases for the text to make any sense. Consequently, if students are familiar with the subject matter (e.g., folklore, regional habits, traditions, and customs), they will comprehend the text message effectively. Hence, it can be assumed that meanings and comprehension arise when the preexisting knowledge of readers (schemata) aligns with the information they have gleaned from the text.

In addition, studies show that text familiarity largely influences overall pupils' performance since students decode the message of a text noticeably better when they find local or familiar items and global objects (Dehghan & Sadighi, 2011; Pei-shi, 2012; Zarei & Mahmudi, 2012). However, some authors emphasize the importance of having a considerable repertory of

words (vocabulary knowledge) since it is a factor that shapes the successful comprehension of a text (Dehghan & Sadighi, 2011; Pei-shi, 2012; Zarei & Mahmudi, 2012).

The last advantage of using schema theory is that it helps to save time when reading and motivates students to read. In this regard, Che (2014) and Ghorbandordinejad and Bayat (2014) stated that students' reading comprehension can be improved and their schemas about the texts that they are reading can be quickly formed or activated with the aid of the schema method. Also, the authors suggested that pre-reading exercises can save reading time since they help by providing learners with relevant background information about the text. Thus, this can spark students' interest in texts that they may not have previously been interested in or knowledgeable about.

4.3.2 Negative or Challenging Aspects of Using Schema Theory

Table 4

Challenges or Disadvantages of Using Schema Theory

Author(s)/ year	Challenge	N	%
AlJahwari & Al-Humaidi, (2015); Dehghan & Sadighi (2011); Jahangard et al. (2012); Che (2014)	Misunderstandings arise if schema theory is not correctly applied.	4	45%
Al Ghafri et al. (2020); Zhao & Zhu (2012)	Activating schema requires extra effort or time for teachers.	2	22%
Li & Zang, (2016)	All schemas have to work simultaneously in English reading.	1	11%
Deshpande, (2016); Kashani Mahmood et al. (2013)	Material problems Use of materials	2	22%

N = 9

Table 4 provides information about the challenging aspects of activating schema in an EFL classroom. According to the studies included in Table 4, there are four reported challenges or limitations that can be considered as negative effects of implementing schema theory to improve learners' reading comprehension skills.

The first disadvantage is the emergence of misunderstandings if schema theory is not correctly applied. According to Jahangard et al. (2012) and Che (2014), when pupils come across or read text that makes sense in their prior knowledge, they incorporate it into their preexisting schemas. That is how learners develop or enlarge their conceptual schema. Nevertheless, a schema might alter if the preexisting information does not match the new one. Consequently, if the information in the text does not fit into the reader's preconceived notions, the reader will either misinterpret the new information, ignore it, or modify the message to fit the facts in the passage.

Another aspect that contributes to misunderstanding a text is the lack of teachers' training. Studies show that teachers tend to have excessive dependence on a small number of strategies that students employ when reading, and a clear attribution to this is the inadequate teacher preparation for using schema theory and its teaching methods (Al-Jahwari & Al-Humaidi, 2015; Dehghan & Sadighi, 2011). The results found that a large number of teachers did not apply reading techniques effectively such as brainstorming, asking questions, or introducing the reading text with the title (Al-Jahwari & Al-Humaidi, 2015; Dehghan & Sadighi, 2011).

The second reported limitation is that activating schema requires extra effort or time for teachers. In this regard, Al Ghafri et al. (2020) and Zhao and Zhu (2012) mentioned that teachers should ensure that the materials are appropriate for students' academic level and connect to their prior knowledge when assigning tasks, exercises, puzzles, and other materials.

Furthermore, the scholars found that students occasionally fail to store the correct schema. In these situations, teachers might use pre-reading exercises to assist students in building-related schema or activating prior schema (Al Ghafri et al., 2020; Zhao & Zhu, 2012). In consequence, teachers should plan and dedicate time to carefully plan their activities, but also consider the time it will entail to apply the planned activities during the class.

The third challenge is that all schemas work simultaneously in English reading. According to Li and Zang (2016), text comprehension is based on language schema (grammar and sentence structures), content comprehension is based on the content schema (different topics), and drawing attention to the content is based on form schema (types of texts). Together, three schemata support English reading and none of the three can be disregarded. In this aspect, a strong schema frequently combines discourse structure with textual content, and it also helps pupils comprehend and make sense of the entire text. Then, learners cannot learn English effectively if they lack basic information (Li & Zang 2016).

The last reported challenge has to do with the materials and their use in an EFL English classroom when using schema theory. According to Deshpande (2016) and Kashani Mahmood et al. (2013), even with the assistance of modern tools like language labs and other audiovisual instructional resources, teachers in developing nations still confront tremendous hurdles that prevent them from applying schema theory to their English reading classes. In addition, the previous authors pointed out that the use and management of technology also represents a problem for teachers since they are not well prepared to use it in classrooms.

Finally, researchers reported that when materials are not culturally recognizable; i.e., adapted to learners' realities and experiences, comprehension of a text does not take place (Deshpande, 2016; Kashani Mahmood et al., 2013). Therefore, proper instructional resources and techniques help students to make sense of the content and focus on the key concepts to lessen their memory load.

4.4. Elements of Schemata that Intervened in the Development of Reading

Comprehension Skills

Schema activation involves using prior knowledge to interpret and construct new information wherein readers assimilate and accommodate incoming text to their existing mental frameworks. That is why schema theory underscores the significance of considering how different elements contribute to or interfere with the comprehension process. These elements include the different techniques or strategies used for activating schema and the role of teachers in using schemata.

The following table provides information on different techniques for activating schema in English learners. For purposes of this study, the presented techniques are considered as one of the reported elements that intervene with the development of English reading skills according to how they are employed.

4.4.1. Techniques Used in the Application of Schema

Table 5

Techniques Used in the Application of Schema

Author/year	Techniques/ Strategies	Reading stage when techniques/strategies are used	N	%
Bensalah & Guerroudj (2020); Ghorbandordinejad & Bayat, (2014); Pei-shi (2012)	Pre-reading activities	pre-reading	3	23%
Deshpande (2016); Zarei & Mahmudi (2012)	Schema-building and schema activation	pre-reading while reading, and post-reading	2	15%
Alhaisoni (2017); Al Asmari & Javid (2018); Zarei & Mahmudi (2012); Zhao & Zhu (2012)	questioning brainstorming	pre-reading, while reading, and post-reading	4	31%
Hamid et al. (2020); Park & Kang (2018)	making predictions and connections	pre-reading and while-reading	2	15%
Kashani Mahmood et al. (2013)	graphic organizers	pre-reading, while reading, and post-reading	1	8%

Mills (2019)	text connections, pre-reading, while 1 8%	cloze readings, and reading, and post-reading	hands-on lessons
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N=13

Note: The first two techniques are analyzed in general terms because that is what the authors reported. However, the remaining techniques are described in more detail.

Table 5 reveals information about the different techniques/strategies used to activate schema in EFL learners. First, Bensalah and Guerroudj (2020); Ghorbandordinejad and Bayat (2014), and Pei-shi (2012) mentioned pre-reading activities as a crucial factor in improving reading comprehension. These authors claimed that students are better prepared for the text content through pre-reading activities. For instance, when the schema of readers and writers differ, pre-reading exercises can help by providing relevant background information about the text. Besides, if readers and the writer have similar background knowledge, pre-reading activities can also try to activate readers' schemata. Another important factor is that the teacher can use pre-reading activities to increase background knowledge by increasing vocabulary and consequently expanding the linguistic repertoire of students (Bensalah & Guerroudj, 2020; Ghorbandordinejad & Bayat, 2014; Pei-shi, 2012).

Second, schema-building and schema activation can be used in any reading stage and positively affect reading awareness. Furthermore, these strategies cannot work separately since one triggers another. Therefore, schema building may be an efficient approach that helps children with prior knowledge by providing them with various learning experiences, especially when it is not presented in their social-cultural environment. Then, schema activation can aid pupils in recognizing different elements involved in reading, allowing them to be aware of the information and relate their knowledge with the new information in a text (Deshpande, 2016; Zarei & Mahmudi, 2012).

Third, questioning and brainstorming are techniques used in the pre-reading, while-reading, and post-reading stages. According to Alhaisoni (2017), Al-Asmari and Javid (2018), Zarei and Mahmudi (2012), and Zhao and Zhu (2012), these teaching strategies are a great way to stimulate students' interest and curiosity while also activating their prior knowledge. Teachers can create effective questions and interactive environments to give ideas by integrating the text content with the knowledge and experience of their students before, during, or after the lesson. Therefore, a teacher's job is to help students understand texts by drawing on their previous knowledge. This is done mostly by asking questions during the whole reading stages, and by giving students the necessary prior information if they do not have it.

Fourth, according to Park and Kang (2018) and Hamid et al. (2020), prediction and connection strategies are efficient in developing reading skills. Nevertheless, the first one allows pupils to have easy reading comprehension and helps them to establish a purpose for their reading. The second one, connection, helps readers who frequently scan texts without pausing to analyze if the text makes sense in light of their prior knowledge or whether this information may be applied to better grasp difficult content. Subsequently, it is noticeable that predicting and making connections contribute significantly to improving the speed of understanding a message in reading comprehension.

Fifth, according to Kashani Mahmood et al. (2013), graphic organizers are resources that provide visual representations of general linked topics. They can be applied in the activities before, during, and after reading. Also, they can be used by teachers to assess their students' reading comprehension. Moreover, graphic organizers assist the brain's left and right hemispheres in making sense of data and looking for patterns in the data learner's process. Also, they allow teachers to reach a large number of pupils and provide them with the tools they need to improve comprehension skills (Kashani Mahmood et al., 2013).

Lastly, Mills (2019) reported that regardless of ability and reading proficiency levels, learners can increase their overall schema and, in turn, display overall improvement in their reading comprehension through the use of text connection tools, cloze readings, and hands-on lessons. The author demonstrated that all of these resources combined can enhance understanding. Additionally, the author showed that all students benefited from teacher-provided hands-on lessons and opportunities to develop schema and improve reading comprehension (Mills, 2019).

Based on the analysis, it can be inferred that sometimes if the reported techniques are not correctly applied, they can interfere with the development of reading comprehension skills. Therefore, it is essential to highlight the importance of teachers' training, attitude, and desire to teach when teaching reading to EFL students. Moreover, by being aware of the intervention of these possible elements, teachers and students can use methods to decrease their negative effects on reading comprehension. Despite the difficulties of schema theory, some techniques can improve reading comprehension abilities. These include encouraging active schema activation, using graphic organizers, making predictions, and encouraging flexibility in the application of schemas.

4.4.2 Teachers' Role Regarding the Use of Schema Theory

A useful framework for comprehending how students learn and process information, including reading comprehension, is schema theory. Hence, it is important to consider that educators have the biggest responsibility of ensuring the success of learners by offering

direction, modeling, and supporting students. The following table presents information about the different roles of teachers when using schema theory in their classrooms.

Table 6

Role of the Teacher Regarding the Use of Schema Theory

Author/ year	Teachers' role	N
Al Asmari & Javid (2018) *; Che (2014); Dehghan & Sadighi (2011) *; Huyen & Trang (2020); Li & Zang (2016); Zarei & Mahmudi (2012); Zhao & Zhu (2012) *	Activating prior knowledge	7
Ekasary et al., (2022); Kashani Mahmood et al. (2013) *; Zhao & Zhu (2012)	Modeling instruction	3
Al Asmari & Javid (2018); Kashani Mahmood et al. (2013); Smith et al. (2021); Zhao & Zhu (2012)	Selecting appropriate materials	4
Al Asmari & Javid (2018); Alhaisoni (2017); Al-Jahwari & Al-Humaidi (2015); Mahmudi (2012); Zhang (2016); Zhao & Zhu (2012)	Motivating students	6
Bensalah & Guerroudj (2020); Dehghan & Sadighi (2011); Zhang (2016)	Being trained and well-prepared to use schema	3
Abdelaal & Sase (2014); Al Asmari & Javid (2018); Pei-shi (2012)	Acting as an observer and a facilitator	3

N=17

***Note:** In this table, some studies mentioned more than one role of the teacher.

Table 6 shows the different roles that teachers play when using schemata to facilitate comprehension of a text. In this section, 16 out of 25 studies were analyzed as they provide detailed information on the role of the teacher.

In Table 6, a considerable number of studies report that activating prior knowledge is essential for achieving an efficient understanding of a message. Furthermore, the studies mention that by activating prior knowledge students will be able to develop abilities, such as reading effectively, thinking independently, and developing problem-solving abilities (Al-Asmari & Javid, 2018; Che, 2014; Dehghan & Sadighi, 2011; Huyen & Trang, 2020; Li & Zang, 2016; Zarei & Mahmudi, 2012; Zhao & Zhu, 2012). Consequently, it can be inferred that the activation of prior knowledge is one of the most important roles that teachers have.

Unfortunately, although language schema (grammar, sentence structures, and vocabulary) is taught with great attention by teachers, activating prior knowledge is disregarded (Li & Zang, 2016; Zhao & Zhu, 2012). As a result, reading comprehension has devolved into a passive and mechanical activity in which understanding the meaning of every single word is more important than understanding the message of a text.

In the case of modeling instruction, Ekasary et al. (2022), Kashani Mahmood et al. (2013), and Zhao and Zhu (2012) stated that teachers should share examples of their knowledge to help students remember background information while reading material. This activity can be developed before students read, so educators should provide them with any background knowledge about the reading material. Naturally, because prior knowledge develops the ability to anticipate meaning during the reading process, students can take advantage and become active readers.

Regarding the role of the teacher in using schema theory, Al-Asmari and Javid (2018), Kashani Mahmood et al. (2013), Smith et al. (2021), and Zhao and Zhu (2012) reported that teachers have to be very careful when selecting appropriate materials. It is an important role of the teacher since it helps students to make sense of the information, identify the key ideas of a text, become more motivated, and improve their reading comprehension. Likewise, the authors advised that teachers might use audiovisual materials, such as slides, videos, photographs, and internet resources to engage their students' subject schemata, especially during the pre-reading stage. Finally, these researchers highlighted the importance of considering learners' English language proficiency, interests, ages, and prior knowledge for selecting appropriate materials.

Teachers can also have the role of motivators; they can involve the students in a more fruitful and efficient schema-building activity. Thus, the instructors ought to motivate and prepare them to actively participate in the reading process (Alhaisoni, 2017; Al-Jahwari & Al-Humaidi, 2015; Mahmudi, 2012; Zhang, 2016). Thereby, instructors should realize how important it is to draw on students' prior knowledge to guide and help them to decode information. Furthermore, Al-Asmari and Javid (2018) claimed that teachers should make sure that their pupils can become autonomous, self-sufficient readers by teaching them the necessary skills and giving them more assignments. For example, teachers can foster students' cultural background reading by promoting broad reading, enhancing their content schema, and enhancing their world cognition and common sense (Zhao & Zhu, 2012).

Another role of the teacher is to be trained and well-prepared to teach using schema theory. In this aspect, Bensalah and Guerroudj (2020), Dehghan and Sadighi (2011), and Zhang (2016) stated that teachers have the responsibility of being prepared to teach. The authors mentioned that teachers should be prepared with both content and pedagogical

knowledge. Also, language teachers must take in-service training and workshops to familiarize themselves with the strategies and techniques for teaching reading using schemata. Thus, if teachers are not prepared, they will not pay attention to students' understanding of cultural knowledge, and ignore the context, culture, and background; therefore, they cannot foster students' enthusiasm for reading and improving their reading comprehension. As a result, reading classes may become teacher-centered, and students may become passive learners.

According to the studies analyzed, the last reported role of the teacher is acting as an observer and a facilitator. Al-Asmari and Javid (2018) claimed that educators must recognize the reading challenges that their students face and work with them one-on-one and in groups. The purpose of these activities is to minimize problems by activating students' prior knowledge and giving them ample practice with reading material that is familiar to them in terms of culture and information. Because of this, by teaching learners the necessary skills and giving them more assignments, teachers should ensure their pupils become autonomous and self-sufficient readers. In addition, Abdelaal and Sase (2014) and Pei-shi (2012) mentioned that teachers should become facilitators in an English reading classroom by helping students acquire the necessary background information. Furthermore, the previous authors stated that students' reading comprehension would only become better if teachers make an effort to take prior knowledge into account when they are teaching. Hence, teaching EFL students that reading is a process of effectively utilizing prior knowledge to construct new knowledge is the teachers' responsibility.

CHAPTER V

Conclusions and Recommendations

5.1. Conclusions

This research synthesis aimed to analyze how schema theory impacts the development of reading comprehension English skills in EFL learners. This goal was achieved through the analysis of 25 articles which provided insights into the advantages, disadvantages, methods, techniques, and the overall contribution of schema theory to developing reading comprehension skills. Furthermore, key ideas from the theoretical framework were considered while describing the findings. After conducting the analysis, the following conclusions were derived.

Regarding the first research question about the reported effects of knowledge schemata on the reading comprehension of EFL learners, the analyzed articles provide information on the positive and negative effects of using schemata. It can be concluded that schema theory provides a valuable framework for understanding how readers comprehend and interpret texts by recognizing the importance of prior knowledge and experiences in the reading process. According to Plant and Stanton (2013), the previous statement is also related to the primary principle of schema theory, which explains that individuals encountering cultural, professional, or social disparities lead to distinct schemata, which in turn produce different views and interpretations. Moreover, as Zhao and Zhu (2012) confirmed, the use of schema theory will help learners delight in reading, increase the pace when they read, and form appropriate judgments. Consequently, using schema theory benefits and provides learners with a great tool to improve their reading comprehension skills.

Nevertheless, the analyzed articles also reported the negative aspects of using schema theory; in this regard, it can be assumed that schemata are influenced by learners' backgrounds, experiences, and cultural contexts. As a result, it can create biases in comprehension, and readers from different cultural backgrounds may interpret texts differently (misunderstand) or have different schema structures. The previous statement is confirmed by Jahangard et al. (2012), who concluded that if the reader's schemata are not adjusted to accommodate the new information, this information may be misinterpreted or ignored by learners.

To answer the second research question about which elements of knowledge schemata intervened in the development of reading comprehension skills, the different articles reported that the techniques that instructors used to activate schema are an important factor for understanding a text. In this regard, Zhang (2016) found that students may acquire many helpful reading techniques and abilities as well as form healthy reading habits

with the aid of a schema teaching approach. In addition, the author mentioned that it is important for teachers to assign a variety of activities based on the use of different techniques. Some of these techniques include pre-reading activities, schema-building and schema activation, questioning, brainstorming, making predictions and connections, graphic organizers, text connections, cloze readings, and hands-on lessons. All these techniques can be adapted and used in any reading stage according to the aim of the reading activity.

Another element that influences the development of reading skills is the role that the teachers have when instructing reading. It may include encouraging schema activation, critical review of preexisting schemas, and flexibility in the employment of schemas by selecting and using the appropriate materials. In general terms, it can stand out the fact that teachers may play a vital role in helping students leverage their prior knowledge to become more proficient and confident readers (Al-Asmari & Javid, 2018).

In consequence, it can be concluded that by being aware of the possible sources of intervention, teachers and students can employ different strategies to lessen the negative effects of schemata and enhance their proficiency in reading comprehension. This idea is supported by Al Ghafri and Audeh (2020) who reported that for comprehension to take place, the reader's mental information should fit with the information stated in a text. Hence, to assist learners make sense of what is written, the knowledge in their minds interacts with what is written down. Stated differently, readers interpret what is written in the text by drawing on their mental representations. That is why materials, exercises, and activities should agree with the student's academic level and prior knowledge (Kashani Mahmood et al., 2013).

Some implications can be drawn concerning the use of schema theory in an EFL classroom. First, teachers may consider using schema theory since it is an effective tool that contributes to mastering learners' comprehension skills (Ekasary et al., 2022). Furthermore, as mentioned by Bensalah and Guerroudj (2020), due to the effectiveness of implementing schema theory in the classroom, it is fundamental for teachers to be well-prepared and trained to obtain successful results. Therefore, by being aware of these factors, the instruction of reading becomes easier to develop as it is enhanced, and deeper knowledge is fostered via schema theory while teachers employ different methodologies and strategies.

5.2. Recommendations

Based on the 25 articles analyzed and synthesized in this paper, some recommendations can be taken into consideration. Firstly, researchers can focus on how the application of schema can influence the reading comprehension skills of children and adolescents since it

was noticeable that few studies were carried out on the usage of the schema theory in this group of pupils. It is an important recommendation because if there are more studies with these groups of students, teachers can consider the different aspects of using this tool in their classes. Then, they can think about the benefits of applying schema theory to develop reading comprehension skills. Besides, teachers can contemplate the challenges or negative effects to avoid making the same mistakes as other instructors.

Moreover, researchers ought to focus on America, mainly on our country's context since studies that demonstrate how schema is applied in Ecuador were not found. It is imperative to mention that students' realities and contexts play a crucial role as each culture and experience directly influence the particular way of using or applying schema (Al-Asmari & Javid, 2018; Bensalah & Guerroudj, 2020; Ghorbandordinejad & Bayat, 2014). Consequently, the schemata that an Ecuadorian student has can be different from an Asian or European student. Then, if there were more studies in our context, teachers could have more resources about what type of reading to provide to their students (cultural schema) which can enhance students' reading comprehension.

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