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DIRECCIÓN DE POSTGRADO  
FACULTAD DE EDUCACIÓN  
MAGISTER EN INNOVACIÓN DE LA ENSEÑANZA, APRENDIZAJE Y  
EVALUACIÓN DEL INGLÉS

**Towards the improvement of learners' inferential reading skills through web-based strategy training**

Tesis para optar al grado de Magíster en Innovación de la Enseñanza, Aprendizaje y Evaluación del Inglés

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2021

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## Acknowledgments

I would like to express my very great appreciation and admiration to my thesis advisor, Dr. Claudio Díaz Larenas, whose precious guidance made possible the final outcome of this study.

My special thanks are extended to the master's professors for sharing their valuable knowledge throughout the programme and its impact on my professional development.

I am deeply thankful to my family; my mother, husband, daughter, and son whose endless patience, love and support were essential for this stage of my professional development.

I would also like to thank my friends and colleagues Paola, Paula, César and María Angélica for trusting my capacities and providing me with wise advice. Furthermore, I want to thank my dear students who kindly participated in this action research project.

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## List of Acronyms

CEFR	: Common European Framework of Reference for Languages
EFL	: English as a Foreign Language
ESL	: English as a Second Language
ICTs	: Information Communication Technologies
OECD	: Organisation for Economic Co-operation and Development
PISA	: Programme for International Student Assessment
QAR	: Question-answer relationship
SEN	: Special Educational Needs
SO	: Specific objective
VLE	: Virtual Learning Environment

## **Abstract**

Poor inferential reading skills result in comprehension problems. The explicit teaching of strategies and the use of technology help educators to tackle learning needs and innovate teaching in the language classroom. The aim of this action research study is to explore the contribution of web-based strategy training on learners' inferential reading skills. Participants were 8 English language learners from an A1 level in a public high school from Concepción, Chile. During 12 sessions, they were trained on the explicit instruction of inferential reading skills through Question-Answer Relationships: QAR and "It says, I say and so" strategies, which were implemented on the Wix website. To compare learners' inferential reading skills before and after the web-based strategy training, pre and post-tests were analysed through inferential statistics. The effectiveness of the web-based strategy training was assessed by descriptive statistics, as well as through participants' perceptions of web-based activities and strategies. The findings showed participants' inferential reading skills improved after the intervention, the explicit teaching of strategies through web-based activities contributed to learners' inferential skills. In addition, learners perceived the effectiveness of the strategies. Therefore, strategy-based instruction combined with web-based activities, is recommended.

**Keywords:** inferential reading skills, explicit teaching of strategies, web-based activities, QAR strategy, "It says, I say and so" strategy.

## Resumen

Las habilidades inferenciales deficientes de lectura causan problemas de comprensión. La enseñanza explícita de estrategias y el uso de la tecnología facilitan a los educadores a abordar necesidades de aprendizaje e innovar la enseñanza en el aula de idioma. El propósito de ese estudio investigación-acción es explorar la contribución del entrenamiento de estrategia basado en web en las habilidades inferenciales de lectura de los estudiantes. Los participantes fueron 8 estudiantes de un nivel A1 provenientes de un liceo de Concepción, Chile. Durante 12 sesiones, recibieron instrucción explícita de habilidades inferenciales de lectura, a través de las estrategias de relaciones entre preguntas y respuestas “QAR” y “It says, I say and so”, las cuales fueron implementadas en el sitio web Wix. Para comparar las habilidades inferenciales de lectura antes y después del entrenamiento basado en web, se analizaron pruebas con estadística inferencial. La efectividad del entrenamiento de estrategia en actividades web fue evaluada con estadística descriptiva al igual que las percepciones de los participantes en cuanto a las actividades basadas en web y las estrategias. Los resultados indican que los participantes mejoraron sus habilidades inferenciales de lectura, la enseñanza explícita de estrategias a través de las actividades basadas en web contribuyó a las habilidades inferenciales de lectura. Adicionalmente, los estudiantes percibieron la efectividad de las estrategias. Por lo tanto, se recomienda la instrucción de estrategias combinada con actividades basadas en web.

**Palabras clave:** habilidades de lectura inferencial, enseñanza explícita de estrategias, actividades basadas en web, estrategia QAR, estrategia “It says, I say and so”

# **CHAPTER I: INTRODUCTION**

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### **1.1 Background information**

As a public school, Liceo Simón Bolívar follows the Chilean Ministry of Education study programs for high school students, which state that all learners of English as a Foreign Language (EFL) should develop the four language skills; listening, reading, writing and speaking to achieve language proficiency (Ministerio de Educación, 2016). Additionally, the programs promote learning strategies as well as ICTs skills. Regarding reading comprehension skill development, “all learners should be able to use strategies such as making predictions, skimming, scanning and making inferences, among others” (p. 103). On the other hand, the programs promote cross-cutting learning objectives through which students are expected to develop their critical thinking skills (p. 38) as well as ICTs skills (p.17).

### **1.2 Problem identification**

However, it has been perceived through classroom observation and assessment analysis that most of learners present a poor understanding of the text overall, which make them experience difficulties in reading comprehension. For instance, they often read the same paragraph many times, take longer time to grasp meaning and noticing details. Therefore, inference-making becomes difficult for them since it demands a more complex cognitive process.

In response to this problem, the following study aims at improving learners’ inferential reading skills by providing them with explicit instruction of inferencing strategies through web-based activities. As Kispal (2018) points out “the ability to draw inferences predetermines reading skills: that is, poor inferencing causes poor comprehension and not vice versa” (p.2). In the same line, Friesen & Haigh (2018) note that “inferences involve identifying information that is not explicitly found in the text but is required for understanding the text”. Besides, students can learn to use a strategy to answer inferential questions (Fritschmann, Deshler & Schumaker, 2007), since explicit instruction of inference strategies helps learners to achieve reading fluency and it encourages them to reflect on their own understanding and learning (Friesen & Haigh, 2018). On the other hand, the use of ICTs and multimedia contents such as web-based tools and web-based strategy training improve reading comprehension in learners, (Johnson-Glenberg, 2005), and increase interest in learning and attention, being an opportunity for developing enriching learning activities (Drigas, Loannidou, Kokkalia, & Lytras, 2014).

In view of the above, this study contemplates explicit instruction in inference reading comprehension strategies which involves teacher modelling, instruction and feedback. Then, web-based strategy training; which implies learners’ guided and independent practice through reading comprehension activities designed for this purpose on the WIX website. The didactic material design includes short texts

supported by visual aids such as images, quizzes, a forum and formative assessment.

In short, making inferences in reading comprehension demands higher-order thinking, from which students need extra support to overcome the difficulties they face when making inferences. Consequently, reading difficulties impact negatively in their language proficiency, academic success and their development of critical thinking skills. Taking into account all of the aspects mentioned above, explicit inference-making strategy instruction aligned with web-based training activities on WIX website, would lead to significant improvements in learners' inference reading skills.

### **1.3 Aims**

The general objective of this action research is to explore the contribution of web-based strategy training on learners' inferential reading skills. Additionally, the specific objectives are:

SO1: To compare learners' inferential reading skills before and after the web-based strategy training.

SO2: To assess the effectiveness of the web-based strategy training on learners' inferential reading skills after every online session.

SO3: To examine learners' perceptions of the inference-making strategies and web-based strategy training.

## **CHAPTER II: CONCEPTUAL FRAMEWORK**

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### **2.1 Reading comprehension skill**

According to the national guidelines, reading comprehension constitutes a crucial tool for accessing to new knowledge, interesting topics and cultural aspects (MINEDUC, 2015). Nevertheless, and despite of the relevance given to this skill, the results of SIMCE test show that 11<sup>th</sup> graders in public schools have poor comprehension when reading (Agencia de Calidad de la Educación, 2012, 2015, 2018), placing them in lower A1 level in the CEFR, which means that most Chilean students in grade 11 (+16) are able to “understand common and familiar expressions and basic phrases in order to satisfy specific necessities” and “recognise names, words and phrases which are found in signs and daily situations” (Agencia de Calidad de la Educación, 2018, p.7).

According to Grellet (1981) reading comprehension can be defined as “understanding a written text means extracting the required information from it as efficiently as possible” (p.39). A key component of comprehension is the background or prior knowledge that a reader brings to the reading task, which includes knowledge and understanding of the text format, the purpose for reading and the content of the text. Reading comprehension is a process which implies the use of strategies to interact with a text and make connections between the text and background knowledge (McDonough, Shaw, & Masuhara, 2013).

When reading a text, learners first learn how to understand the text literally, then to infer meanings from it, followed by the text evaluation. Consequently, there are three levels of comprehension. Alderson (2005) describes them as “reading the lines”, “reading between the lines” and “reading beyond the lines” (p.8). Then, Barrett (Clymer, 1968) developed a simple three-level taxonomy that is useful in understanding how readers comprehend as follows: literal or factual comprehension, inferential comprehension and critical or evaluative comprehension. Finally, Westwood (2003), classifies levels as literal comprehension, interpretation, critical reading and creative reading.

#### **2.1.1 Reading strategies**

Recent approaches to the teaching of reading have remarked the relevance of learners acquiring strategies for achieving comprehension (Alderson, 2005). It is important to note the difference between strategy and skill. Although, there is no consensus in the literature if strategies are conscious or subconscious (Macaro, 2001), some authors (Duffy, 2009; Wenden, 1986) define strategies as techniques, tactics, conscious plans, consciously and operations. On the other hand, skill is “something you do automatically without thinking about it, you do it the same way every time” (Duffy, 2009, p.13). Additionally, Richards & Schmidt (2010) state that a skill is “an acquired ability to perform an activity well, usually one that is made up of a number of co-ordinated processes” (p.532).

Strategies have been distinct by some authors. Duffy (2009) categorizes strategies as “before”, “as you begin”, “during” and “after” reading (p. 19). Then, Rubin (1987) classifies them as cognitive and metacognitive learning strategies and communication and social strategies. Finally, Bouchard (2005) affirms that “making inferences, visualizing and predicting are all examples of cognitive strategies that help learners to manipulate the material to be learned mentally” (p.5).

Successful reading comprehension is “dependent on a number of different strategies and the way these are combined to overcome difficulties in text” (Macaro, 2001, p.37). Concerning reading comprehension strategies, Beers (2003) suggests teaching them by comparing and contrasting, connecting to prior experiences, summarizing, predicting, inferencing, seeing causal relationships, questioning the text and visualizing.

## **2.2 Inferential reading skills**

In learning and comprehension, inferencing is “the process of arriving at a hypothesis, idea, or judgement on the basis of other knowledge, ideas, or judgements, that is, making inferences or inferring” (Richards & Schmidt, 2010, p. 280). Inferencing is considered as one of the most relevant processes for achieving comprehension when reading being perceived as a higher-order skill. O’Brien, Cook & Lorch (2015) define inferencing as “the act of deriving logical conclusions from premises known or assumed to be true” (p.3). In simpler words, Duffy (2009) defines it as the ability to “read between the lines or to get the meaning an author implies but does not state directly” (p. 122) and the ability to use two or more pieces of information from a text in order to reach a third piece of information that is implicit (Kispal, 2008). Finally, Beers (2003) defines it as “the ability to connect what is in the text with what is in the mind to create an educated guess” (p. 62).

Hence, comprehension requires making inferences, as Duffy (2009) highlights, inferring is required during all reading comprehension as when a reader makes predictions and using text cues, he or she uses background knowledge to infer what will come next, then, predicting is also an inference.

### **2.2.1 Types of inferences**

Different researchers have granted to inferences different categories; however, there is no consensus in the literature about the number of types of inference, or how they should be classified. Richards & Schmidt (2010), classify inferencing as:

“(a) propositional inferences: those that follow on logically and necessarily from a given statement; (b) enabling inferences: related to causal relationships between events or concepts; (c) pragmatic inferences: provide extra information which is not essential to the understanding of a text, but which expands on it; (d) bridging inferences: those that are needed if a text is to be understood coherently; and (e) elaborative inferences: those that are not actually necessary to understand a text” (p.289).

Kispaal (2008) in her literature review describes numerous types of inferences.

Name	Example	Explanation
<b>Coherence or intersentence or text-connecting</b>	Peter begged his mother to let him go to the party.	Maintains textual integrity. The reader would have to realise that the pronouns 'his' and 'him' refer to Peter to fully understand this sentence.
<b>Elaborative or gap-filling or knowledge-based</b>	Katy dropped the vase. She ran for the dustpan and brush to sweep up the pieces.	Enriches the mental representation of the text. Drawing upon life experience and general knowledge, the reader would have to realise that the vase broke to supply the connection between these sentences.
<b>Local includes:</b> <b>1. coherence inferences</b> <b>2. case structure role assignments</b> <b>3. antecedent causal inferences</b>	As above  Dan stood his bike against the tree.  He rushed off, leaving his bike unchained.	Creates a coherent representation at the local level of sentences and paragraphs. As above <del>†</del> The reader would realise that the tree is assigned to a location role.  The reader would infer that Dan was in a hurry and left his bicycle vulnerable to theft.
<b>Global</b>	Inferences about the theme, main point or moral of a text.	To create a coherent representation of the whole text, the reader would infer overarching ideas by drawing on local pieces of information.
<b>On-line</b>          <b>Off-line</b>	Superordinate goals of characters or causal antecedents that explain why something is mentioned in the text.  Forecasting future episodes in a text.	These inferences are necessary to understanding and are drawn automatically during reading.  Inferences drawn strategically after reading, usually during a later retrieval task. Not essential to understanding.

(Kispaal, 2008, p.22)

For this study, it has been considered to refer to Beers (2003), who identifies 13 types of inferences that skilled readers make as they read, namely; recognizing pronoun antecedents, using context clues, understanding the grammatical role of unknown words, recognizing character tone, identifying the characters motivations, understanding characters' relationships, providing setting details, providing explanations for events and ideas in the text, offering details, explaining events in the text, understanding the author's point of view, recognizing the author's bias, relating text to their own lives and drawing conclusions.

### **2.2.2 Inference instruction**

In relation to inference instruction, Duffy (2009) suggests to explain when teaching inferring (a) that authors compose text based on their experience background and we construct meanings based on what the author's words make us think about (i.e., our experience background); (b) that authors often leave information unstated or implied, expecting readers to infer it: (c) that comprehension is an active process of constructing meaning, which means we must infer; (d) that inferring is virtually the same process as predicting.

Modelling and explicit instruction in making inferences can support readers' higher-level comprehension of literary text (Hansen & Pearson, 1983; Tovani, 2000). Kispal (2008) suggests that inference instruction should include teacher modelling, training learners on Wh-questions and ask them to create their own questions from the text.

Teaching inferential reading skills is fast becoming a key instrument for archiving reading comprehension. Hence, inference-making, which is a necessary component of reading comprehension, may be difficult for them. Jumiati, (2014) points out that inference strategy could improve the students' reading comprehension both literal and interpretative conclusion. Additionally, learners with special needs can master their inferential skills to improve comprehension (Decker, 1998).

Learners need opportunities to practice the strategies over a sustained period of time. Studies have demonstrated that instruction in the inference strategy increases students' use of strategic skills to a mastery level (Ballou, 2012; Fritschmann, Deshler, & Schumaker, 2007).

### **2.3 Explicit instruction of strategies**

When learning a second foreign language is important to offer learners the opportunity to develop independent language learning skills (Macaro, 2001). Learning strategy training is defined as "training students in the use of learning strategies in order to improve their learning effectiveness" (Larsen-Freeman, 2000, p.160). In the same line, Oxford (1990) defines them as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self -directed, more effective and more transferable to new situations" (p.8).

Macaro (2001) makes an interesting distinction between learner strategies and language learning strategies. The former “are those used by learners to help with the accomplishment of all language-related tasks” and language learning strategies “refer more specifically to the process of language learning whereas learner strategies might be interpreted as techniques in the learning of any subject” (p.20).

The National Curriculum Guidelines promote teaching strategies for learning in order to allow students taking control of their learning process, which improves their self-confidence, motivation and learning with the subject. –Nowadays, it is considered that both implicit and explicit teaching of strategies facilitates internalization, storage, recall and the use of new language elements, which contributes to language skills improvement. It is important to note, that those strategies need to be suitable to learners needs, learning styles and interests (MINEDUC, 2016).

On another note, self-regulation is a fundamental property of metacognition and it requires that the students play an active role and monitor the effects of the actions they take and decisions they make while learning (Westwood, 2003).

Explicit teaching is the term used to describe a very direct way of instructing children in important skill and content areas of the curriculum (Westwood, 2003 p.6), such as reading strategies, since they are affective to improve reading comprehension (Lee, 2013; Uribe, 2015) and help learners to be more conscious of the strategies and expand their range so that they can use them more effectively (Ferris & Hedgcock, 2018). Marzano, Pickering & Pollock (2001) determine “skills are most useful when learned to the level of automaticity, which require little or no conscious thought” (p.147).

A teacher needs to provide clear modelling of the most appropriate strategies to use to minimize the chances of failure and to maximize the chances of early success (Westwood, 2003; Wilhelm, 2001). Besides, Bouchard (2005) points out that for ELLs “strategies should be taught by modelling followed by guided practice, independent practice, evaluation and application of the strategy” (p.11). It also must be considered the cultural background, mother tongue, learning style and English language level. In her study Jozwik (2005) concludes that a functional relation between explicit reading comprehension strategy instruction with a self-monitoring procedure improve learners’ reading comprehension performance.

Explicit instruction of strategies is an increasingly important area in ELT. Beers (2003) in her book inspired by struggling readers entitled “When kids can’t read”, offers the steps to teach comprehension strategies explicitly and directly for instance, to decide specific strategies to model, guided and independent practice.

Within the explicit teaching of strategies feedback should be considered, to make it effective should be timely, as Marzano, Pickering & Pollock (2001) state “the more delay that occurs in giving feedback, the less improvement there is in achievement” (p.97). The authors highlight that an explanation of right or wrong answers is the best feedback, which can be enhanced by asking learners to keep working on the task until they succeed.

Friesen & Haigh (2018), in their study, found reading strategies can alleviate the cognitive load placed on working memory, which allow learners to achieve comprehension success. These authors emphasize the importance of making strategies explicit because second language learners can articulate how a mental model is formed. Several studies confirm the effectiveness of reading strategies (Ismail & Tawalbeh, 2014; Khademi, Mellati & Etela; 2014; Klinger, Boardman & Vaughn, 2007; Sageghi, Gilani & Niyazi, 2018; Uribe, 2015).

### **2.3.1 Question-answer relationships: QAR**

Question and Answer Relationships (QAR) was developed by Raphael (1986) to teach learners that the two broader sources of information for answering questions are the text and their own background knowledge (Bouchard, 2005). This method that helps learners to become strategic and independent readers (Chien, 2013), has four strategies; namely:

-“Right There”: answers to literal questions can be found in one sentence in the text,.

-“Think and Search”: to find the answer to this type of question by drawing conclusions.

-“The Author and You”: these questions require students to read between the lines, using prior knowledge and information from the text to make inferences and

-“On Your Own”: these questions can be answered from the reader’s own experience without information from the text.

QAR is one of the strategies suggested by experts to improve reading comprehension in learners, as it allows them to maintain their attention, comprehend, recall what they have read, categorize and understand questions to answer successfully (Bouchard, 2005; Rief, 2015; Sorrell, 1996). Research demonstrates that QAR is effective since it helps students to connect prior knowledge to what they are reading, and it makes the facts they are reading about more memorable (Klingner, Vaughn, & Boardman, 2007).

Some research examining QAR instruction has demonstrated the benefits for EFL students’ reading comprehension skills of different age levels (Raphael, 1986; Erdiana, Kasim & Juwita, 2017; Bich & Huan, 2018; Afriani, Anggraini & Riswanto, 2020). Moreover, Raphael (1986) argues that learners without QAR instruction often indicated a lack of strategic behaviour when answering questions and reading. Besides, the value of QAR instruction is the way how students can approach the task of reading texts and answering questions since it helps them to

realize the need to link the information in the text with their own background knowledge.

By considering the diversity of each classroom, students with learning difficulties benefit the most from explicit teaching of new concepts, skills and strategies (Carr & Bertrando, 2012; Westwood, 2003). Also, it provokes them self-confidence. Recent studies on inference-making explicit instruction to struggling readers, conclude that the benefits are significant for reading comprehension (Barth & Elleman, 2017): improve attention, help them to self- monitor and self-check (Keller & Abuelhassan, 2015).

### **2.3.2 “It says, I say and so” strategy**

Beers (2003) suggests “It says, I say and so” strategy to help learners to make inferences when reading. This strategy provides students with a visual scaffold and requires learners to consider questions linked to textual material, find information in the text that responds to the question, interpret the text using inference skills, and combine the information from the text and their own thinking to create an answer (Sari, 2012). The strategy helps students to perceive that when they create meaning, they mix their own ideas with evidence and details that they find in the text. This strategy is materialised in a chart:

- (a) It says: find information from the text that will help to answer the question.
- (b) I say: think about what you know about that information and
- (c) and so: combine what the text says with you already know to answer the question: make an inference.

Research has demonstrated this strategy effectiveness. “It says, I say and so” increases the students literal and interpretative comprehension and becomes learners more active in the learning process (Rajab, 2018; Sari, 2012).

## **2.4 Towards web-based strategy training**

### **2.4.1 Web-based activities**

The Ministry of Education remarks that the development of technologies of information and communication (TICs) and the wide range of resources available constitutes a valuable contribution to teaching and learning a foreign language (MINEDUC, 2015). For instance, integrating skills, maximizing the use of previous knowledge and optimizing resources such as time and materials.

Furthermore, research on the reading technologies demonstrates TICs can have considerable positive impacts on student performance (Johnson, Jacovina, Russell, & Soto, 2016) and prepare students for lifelong learning (Skutil, 2013). For instance, TICs are a meaningful support for learners with learning difficulties, as

they may need accommodations, for instance, digital format texts, assistive technology, the use of visual imagery aids (Brandl, 2002).

Websites have become more dynamic, providing users with online communities and making it easier to share information. Garton & Graves (2014) define eLearning as “the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services” (p.200).

Virtual learning environment (VLE) is a designed information space where educational interactions occur from which students are actors of the virtual space. They are not restricted to distance education, they can enhance classroom activities indeed (Dillenbourg, Schneider & Synteta, 2002). Herrera (2017) found out that students feel motivated by using VLEs and suggested all teachers should include them in their lessons.

Web-based environments are a form of VLE, which allow teachers the opportunity to deliver content in a wide range of formats and create interactive activities. Kiddle (2013) points out “if tasks and instruction is carefully staged, learners may acquire the skills needed to participate fully in teacher-created activities” (p.195).

One of the approaches of online instruction is the “teacher-determined lessons” approach, from which reading activities and materials are comparable to the computer as an online electronic workbook. The teacher selects reading paragraphs or texts, designs comprehension activities, and publish them on his/her Web page. The benefit of this kind of instruction is the flexibility to adapt materials to students’ proficiency level and scaffold the reading tasks by guiding the learners through the texts (Brandl, 2002).

Kiddle (2013) suggests that for language learners with a low level of proficiency, it must be considered to ensure learners have the technical competence to use such a platform, to consider the time investment needed in training teachers and monitor, support, tutor and give feedback in order to be effective, sensitive and supportive.

#### **2.4.2 Web-based training**

Although the design of a website and reading activities have technological considerations, it is a worthwhile work. For instance, it may be time consuming and it requires skills and expertise in ICTs. However, a great deal of research supports the contribution of teacher-determined lessons because of the benefits for instructors and students namely, there is a vast number of texts, images on the internet (Brandl, 2002).

The contents can be adjusted to the learners needs (Tomlinson, 2013). Additionally, forms can be incorporated on the website as a tool of formative assessment.

Web-based training (WBT) is a way of computer-based learning with internet connection for sharing content and supporting communication. Strategy-Based Instruction (SBI) is a learner-focused approach for teaching strategies to enhance learner autonomy and proficiency in language contexts (Rativa, Pedreros & Nuñez, 2012).

Findings on reading comprehension through web-based strategy training demonstrate significant vocabulary and inference-making strategy gains (McNamara, 2012). Studies support its effectiveness, Hecker, Burns, Katz & Elkind (2002), introduced assistive reading software for students with ADD/ADHD. The results of the study indicated that after using the computer assistive software intervention, reading speed showed a small increase and students reported positive attitudes while reading.

Likewise, Fernández, Rodríguez, & Martínez (2013) developed a platform called Picca, for ADHD learners. The results of their experiment show that the employment of web instruction has positive effects within learning skills development for children who struggle with reading.

Finally, a study on the Interactive Strategy Training for Active Reading and Thinking (iSTART) trained readers to use active reading. The results of this study indicated that higher readers gained in terms of deeper levels of comprehension. In distinction, less versatile readers gained in terms of their surface level understanding of the text, showing important gains (Hosoda, 2014; Mcnamara, Levinstein & Boonthum, 2004).

#### **2.4.3 Web and reading materials**

The World Wide Web has expanded the classroom boundaries and increased the opportunities for learners accessing to authentic resources (McDonough, Shaw & Masuhara, 2013) and for teaching accessing to a wide range of resources available. In this line, using illustrations to interact with the text is beneficial for low-proficiency ELLs. This helps build self-esteem and confidence, to access prior knowledge (Brandl, 2002; Bourchard, 2005) and images facilitate contextualization of the reading materials (Brandl, 2002).

Regarding technology supported activities, McDonough, Shaw & Masuhara (2013) recommends taking into consideration “learning assumptions, learner needs, the context (teaching and technology)” (p.104) when designing materials.

As has been mentioned in the previous paragraphs, reading is a complex process, “especially reading in L2 often results in poor comprehension and in low self-esteem” (Masuhara, 2013, p.18). Materials development is a key element of instruction and although it is described as a time demanding process for teachers,

“expertise in materials development can only be gained through developing materials” (Tomlinson, 2013, p. 540).

Tomlinson (2013) states that materials development for language learning would benefit learners by developing materials which:

- have the potential for affective engagement;
- engage the learners in multidimensional processes which match what we are finding out about mental representation and durable learning;
- relate to the interests and enthusiasms of the learners;
- have been designed to facilitate adaptation, localization and personalization;
- cater for different preferred learning and teaching styles;
- both learners and teachers can enjoy using (p.542).

## **CHAPTER III: METHOD**

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### **3.1 Type of research**

The present study follows the framework of action research as this project aims at overcoming learners' difficulties when making inferences in reading through the implementation of learning and web-based strategy training activities on the WIX website. Wallace (1999) defines action research as "an approach of systematic collection and analysis of data to improve some aspects of professional practice" (p. 88). This kind of research involves four stages "(1) identifying the research question, (2) collecting the information to answer the question, (3) analyzing and interpreting the information, and (4) sharing the results with the participants (Berg, 2001, p. 88). Mertler (2006) emphasized action research is a "process that improves education by incorporating change, it also involves educators working together to improve their own teaching practices" (p. 88). Therefore, this project would solve a problem detected in an educational local context in which students face a determined learning need that would be addressed through experimenting how an action plan implemented by the researcher would solve this issue.

In view of the above, the paradigm this study follows is a qualitative approach, as it is expected to explore a research question to be developed in the research process (Mason, 2002) and it allows to share information between the researcher and participant, providing both with an opportunity to share and learn (Macdonald, 2012) as this project will examine what is the contribution of the explicit instruction on QAR strategy through web-based training for improving inferential reading skills on learners by taking into consideration the participants' perceptions about this pedagogical intervention. Finally, the scope of this action research is exploratory, since it attempts to explore how the web-based strategy training to improve inferential reading skills works in the Chilean context.

### **3.2 Description of the participants**

The participants in this research are secondary students from a public school located in Hualpén, Chile. The sample consists of 8 students; 3 boys and 5 girls from 9<sup>th</sup> to 12<sup>th</sup> grade, whose age ranges from 14 to 17 years old. On the English subject, the participants have an A1 level of reading comprehension according to the Common European Framework of Reference for Languages (CEFR), which means they can "read very short, simple texts, find specific information in simple everyday materials" (Council of Europe, 2001, p. 88).

A purposive sampling has been considered for this study. Tomal (2010) defines purposeful sampling as “the selection of those subjects who are the specific individuals for whom improvement is desired” (p. 88). The selection criteria for this project implies the following:

- Technology: most of the participants are keen on technology and skilled ICT’s users, which will allow them to interact with the pedagogical resources incorporated in the action plan, those are web-based activities and data collection instruments on the platform. Furthermore, research on the reading technologies demonstrates they TICs can have considerable positive impacts on student performance (Johnson, Jacovina, Russell, & Soto, 2016).
- Assessment: according to the analysis in previous assessment of reading comprehension skills, the local results show that participants have understanding difficulties when reading a text, especially for inference-making.
- Participants’ willingness to use the strategies in the future as it will be analyzed through the Likert scale.

### **3.3 Research question and objectives**

#### **3.3.1 Research question**

What is the contribution of web-based strategy training for improving learners inferential reading skills?

#### **3.3.2 Research objectives**

##### **3.3.2.1. General objective**

- To explore the contribution of web-based strategy training on learners’ inferential reading skills.

##### **3.3.2.2. Specific objectives**

- To compare learners’ inferential reading skills before and after the web-based strategy training.
- To assess the effectiveness of the web-based strategy training on learners’ inferential reading skills after every online session.
- To examine learners’ perceptions of the inference-making strategies and web-based strategy training.

### 3.4 Research problem

Reading comprehension is a crucial connection to effective reading for academic, professional and personal life. The Programme for International Student Assessment (PISA) defines reading literacy as “understanding, using, evaluation, reflecting on and engaging with texts in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society” (OECD, 2019, p.28). However, recent studies demonstrate that reading skills must improve. To illustrate this, over ten million students worldwide represented by PISA in 2018 were not able to complete the most basic reading tasks in their first language (OECD, 2019). Although Chile leads results in Latin America, its performance is on average two years behind of the Organisation for Economic Co-operation and Development (OECD) students.

In the same line, SIMCE test results report that most of secondary students are placed in an insufficient level of reading (Agencia de Calidad de la Educación, 2012, 2015, 2018). Furthermore, the last English language national study shows that 11<sup>th</sup> graders in public schools have poor comprehension when reading, placing them in lower A1 level in the CEFR, which means that most Chilean students in grade 11 (+16) are able to “understand common and familiar expressions and basic phrases in order to satisfy specific necessities” and “recognise names, words and phrases which are found in signs and daily situations” (Agencia de la Calidad, 2018).

Consequently, this problem has been reflected at Liceo Simón Bolívar through classroom observation and assessment analysis, since most of the students present a poor understanding when reading a text which makes them have difficulties in reading comprehension. From this point onwards there seems to be repeated from the introduction chapter. Consider paraphrasing the introduction section in the form of a summary.

In response to this problem, the following study aims at improving learners’ inferential reading skills by providing them with explicit instruction of inferencing strategies through web-based activities. As Kispal (2008) points out “the ability to draw inferences predetermines reading skills: that is, poor inferencing causes poor comprehension” (p.2). In the same line, Friesen & Haigh (2018) note that “inferences involve identifying information that is not explicitly found in the text but is required for understanding the text” (p.7). Besides, students can learn to use a strategy to answer inferential questions (Fritschmann, Deshler & Schumaker, 2007), since explicit instruction of inference strategies helps learners to achieve

reading fluency and it encourages them to reflect on their own understanding and learning (Friesen & Haigh, 2018). On the other hand, the use of ICTs and multimedia contents such as web-based tools and web-based strategy training improve reading comprehension (Johnson-Glenberg, 2005), and increase interest in learning and attention, being an opportunity for developing enriching learning activities (Drigas, Loannidou, Kokkalia, & Lytras, 2014).

### 3.5 Stages of the action research study

Within a three-week timeframe, this study explored how the implementation of web-based strategy training helped participants to make inferences when reading. The intervention plan was designed for 12 online sessions of one hour. The teacher explicitly taught the Question-Answer relationship (QAR) and “It says, I say and so” strategies, from which learners were trained to make inferences when reading diverse types of texts.

The action plan was implemented as follows:

Stage I Diagnosis: initially, learners answered a reading comprehension pre-test intended to diagnose their level of understanding and ability to make inferences when reading a text. Afterwards, the teacher introduced the concept of inference together with the website designed especially for this study on Wix, from which students were provided with strategy training and assessment.

Stage II Instruction: modelling, guided practice, independent practice, feedback and assessment from the second to eleventh sessions. Therefore, the teacher explicitly taught QAR and “It says, I say and so” strategies, then learners developed guided practice followed by independent practice, feedback and an online quiz with immediate feedback from the platform created on Wix, which design supported instruction and allowed learners to complete different kinds of forms and received immediate feedback from the website. <https://claudiaseguraesl.wixsite.com/website>

Regarding strategies training, the QAR strategy covered the first 6 sessions as follows:

- 1st. “right there” QAR (to read and understand explicit information in one part of the text)
- 2nd. “right there” and “think and search” QAR (to read and understand explicit information in one or more parts of the text)
- 3rd. “own my own” (to read and use background knowledge)
- 4th. “author and me” (to read and understand implicit information, evidence from the text connected with background knowledge=inferences)

5th. QAR classification (to read and label different types of QARs with explicit and implicit information)

6th. QAR generation (to read and write questions and answers using explicit and implicit information)

In the following four sessions (7th to 10th) the inference-making strategy (5) “It says, I say and so” (“It says”: to identify evidence form the text, “I say”: to link with background knowledge and “so”: to make an inference based on “I say” and “I say”) was practiced as participants had to look for evidence in the text, connect the text with their background knowledge and make an inference. Therefore, they were taught to make an inference and to support it.

Stage III Assessment: finally, in session 12, participants answered a reading comprehension post-test and a Likert scale to identify their perceptions about the whole intervention.

### 3.6 Data collection techniques

The following data collection techniques were used in this study:

#### 3.6.1 Reading comprehension test (pre and post)

To compare learners’ inferential reading skills before and after the web-based strategy training as one of the research objectives, a reading comprehension test was designed by the researcher based on Barrett’s Taxonomy. The test assessed inferential skills of topics such as location, time, action, instrument, category, object, cause-effect, problem-solving, feelings and attitude, among others. This instrument contained two items: 5 multiple choice questions (four alternatives) and 10 open questions from short paragraphs, 1 point for each multiple-choice question and 2 points for each open question. (See Appendix A.1)

#### 3.6.2 Online mini quizzes

Secondly, online mini quizzes were the instrument designed by the researcher to address the second research objective. The purpose of this instrument was to assess the effectiveness of web-based strategy training after each session as formative assessment, which allowed to adjust intervention materials and activities to counter issues that might have arisen. Participants answered reading comprehension questions on a quiz tool within the website after each session, which meant they answered 10 mini quizzes throughout the intervention. Every quiz was elaborated with multiple choice and open questions according to the inference-making strategy they were taught at the beginning of the session (See Appendix A.2).

### 3.6.3 Likert scale

A Likert Scale (See Appendix A.3) was designed by the researcher to examine participants' perceptions about the inference-making strategies instruction as well as the use of web-based strategy training after the study intervention. The scale for this study had 2 dimensions; strategy and web-based activities on Wix and 8 descriptors; The participants were asked to rate the levels of agreement they perceived for each statement in a scale of five points: (1) Strongly disagree, (2) Disagree; (3) Don't know; (4) Agree; (5) Strongly agree.

The data collection instruments described above were validated through a validation protocol format sent by electronic mail to three experts belonging to the present master's programme.

## 3.7 Data analysis techniques

To analyze the data collected throughout this study, a quantitative data analysis was carried out. The results were compared through descriptive and inferential statistics as follows:

### 3.7.1 SO1: To compare learners' inferential reading skills before and after the web-based strategy training

The results of the reading comprehension tests before and after the intervention were compared through descriptive statistical analysis and measures of central tendency. According to Tomal (2010), descriptive statistics refer to the use of visual graphics, charts, diagrams, and basic mathematics to describe and summarize quantitative data on a particular group of learners. —On the other hand, Bhattacharjee (2012) defines inferential statistics as “the statistical testing of hypotheses” (p.119). “Inferential statistics also allow researchers to make a valid estimate of the association between an intervention and the treatment effect (causal-effect) in a specific population” (Vetter, 2017, p.1376).

In the light of the above, the Shapiro-Wilk test measured the normality of the data. Vetter (2017) affirms that the Shapiro-Wilk test “is more appropriate for small sample sizes” (p.1379). -Consequently, to compare the test score before and after the intervention, a paired t-test was conducted. According to Bhattacharjee (2012) the t-test examines “whether the means of two groups are statistically different from each other” (p.132). To further evaluate the data and since the sample size of this study was small, the Wilcoxon Signed-rank test was conducted.

### 3.7.2 SO2: To assess the effectiveness of the web-based strategy training on learners' inferential reading skills after every online session.

The eight mini quizzes were analyzed after each intervention through descriptive statistics, mean score and standard deviation.

**3.7.3 SO3: To examine learners' perceptions of the inference-making strategies and web-based strategy training.**

Finally, the Likert Scale was analyzed using descriptive statistics.

**CHAPTER IV: FINDINGS**

## CHAPTER IV: FINDINGS

As this action research aimed at exploring the contribution of web-based strategy training on learners' inferential reading skills, the data collected through the action plan was analyzed to answer the following research question:

What is the contribution of web-based strategy training for improving learners inferential reading skills? To this end, web-based strategy training refers to the explicit instruction of reading comprehension strategies (inference-making) through online activities on the website Wix. In this way, the analysis will be conducted separately according to the specific research objectives.

### 4.1 SO1: To compare learners' inferential reading skills before and after the web-based strategy training.

#### 4.1.1 Descriptive analysis

The mean scores (M) and standard deviations (SD) for the two items in the pre and post intervention tests are presented in Tables 1 and 2. Both tests are similar, item one was related to multiple-choice questions about simple inferences and Item 2 addressed open questions in which participants answered inferential questions and supported their answers with evidence from the text given.

Test items	M	SD
Item 1	6,000	0,756
Item 2	15,38	5,76
Overall Pre-test	21,38	6,28

**Table 1: Global (whole group) M and SD of Items 1 and 2 in the Pretest**

Table 1 above shows the global mean score in the pretest was 21.38 (M=21.38) and the standard deviation was 6.28 (SD=6.28). This explains that there is a high difference between the data and the mean score, which evidences the different levels of inferential reading comprehension among the participants. Table 2 below demonstrates there are noticeable differences in the posttest performances in both item 1 and item 2.

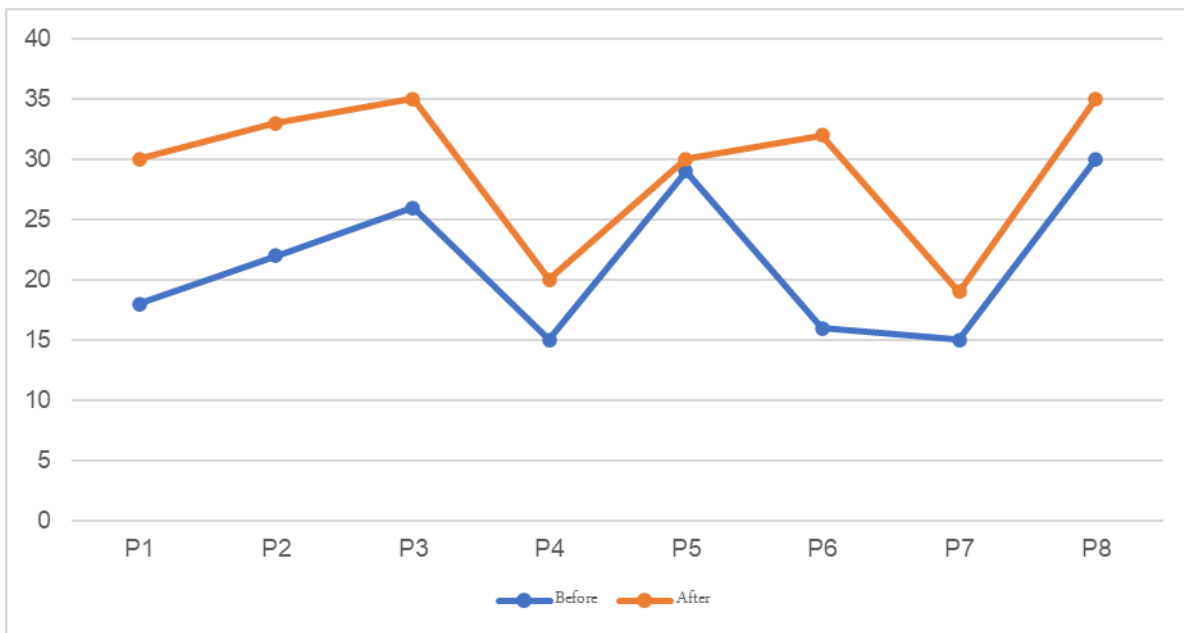
Test items	M	SD
Item 1	6,625	0,744
Item 2	22,63	5,90

Overall Post-test	29,25	6,32
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**Table 2: Global (whole group) M and SD of Items 1 and 2 in the Posttest**

As shown in Tables 1 and 2, the whole group score in item 1 was 0,6 points higher after the intervention as in item 2 was 7,25 points higher. Overall, the global mean score in the posttest (M=29.25) was superior in 7.87 points compared to the pretest score (M=21.38). On the other hand, the standard deviation is high in both pre and posttest, which means every participant progressed correspondingly after the intervention. If the SD in the posttest is compared with the SD in the pretest, there is a slight difference of 0.041.

Figure 1 below shows the comparative results of the pre and post reading tests. As evidenced, none of the students reached the maximum expected score (38) since the highest score was 35 in the posttest. However, 100% of participants improved their scores in the posttest.



**Figure 1: Participants' Scores Before and After the Intervention**

As can be observed in Figure 1, participant 6 doubled his score after the intervention, which is the highest difference in contrast with participant 5 who achieved one extra point in the posttest. Then, participant 3 achieved nine extra points after the intervention.

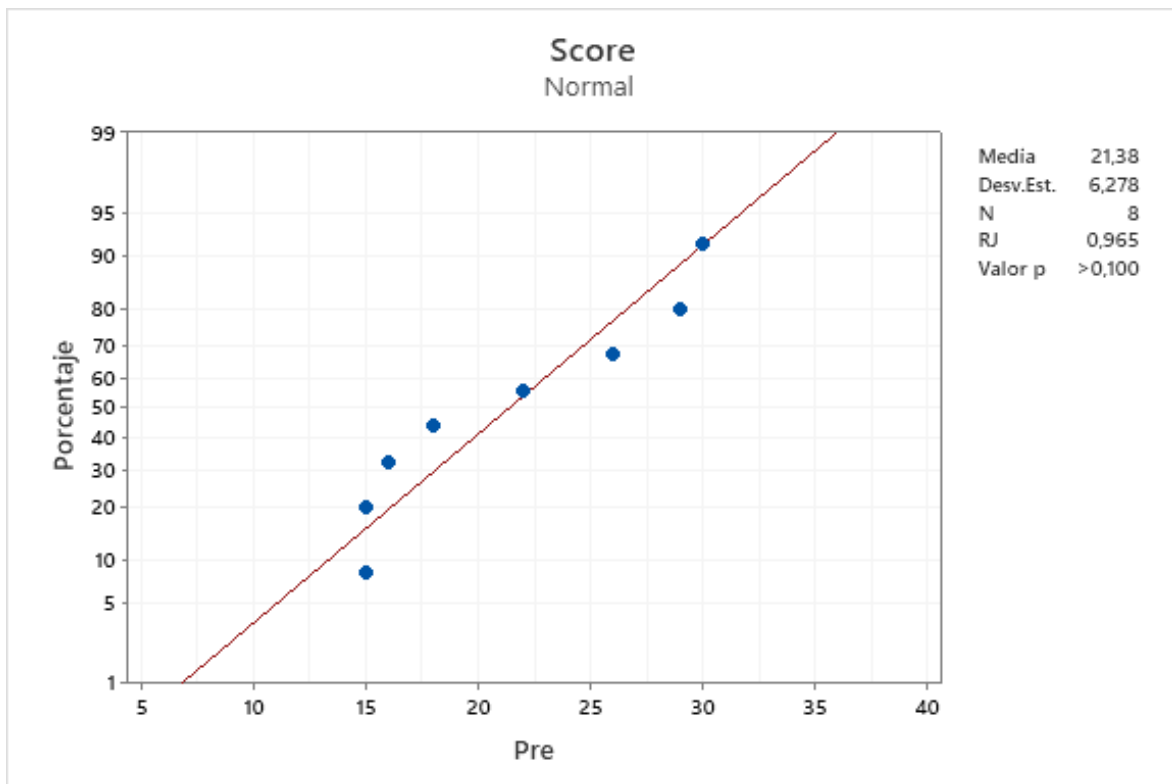
### 4.1.2 Normality test

The Shapiro-Wilk was administered to measure the normality of the data, particularly the scores of the reading comprehension test applied before and after the intervention. Table 3 presents their  $p$ -value.

<i>P-value</i>	
Before the intervention	After the intervention
0,100	0,100

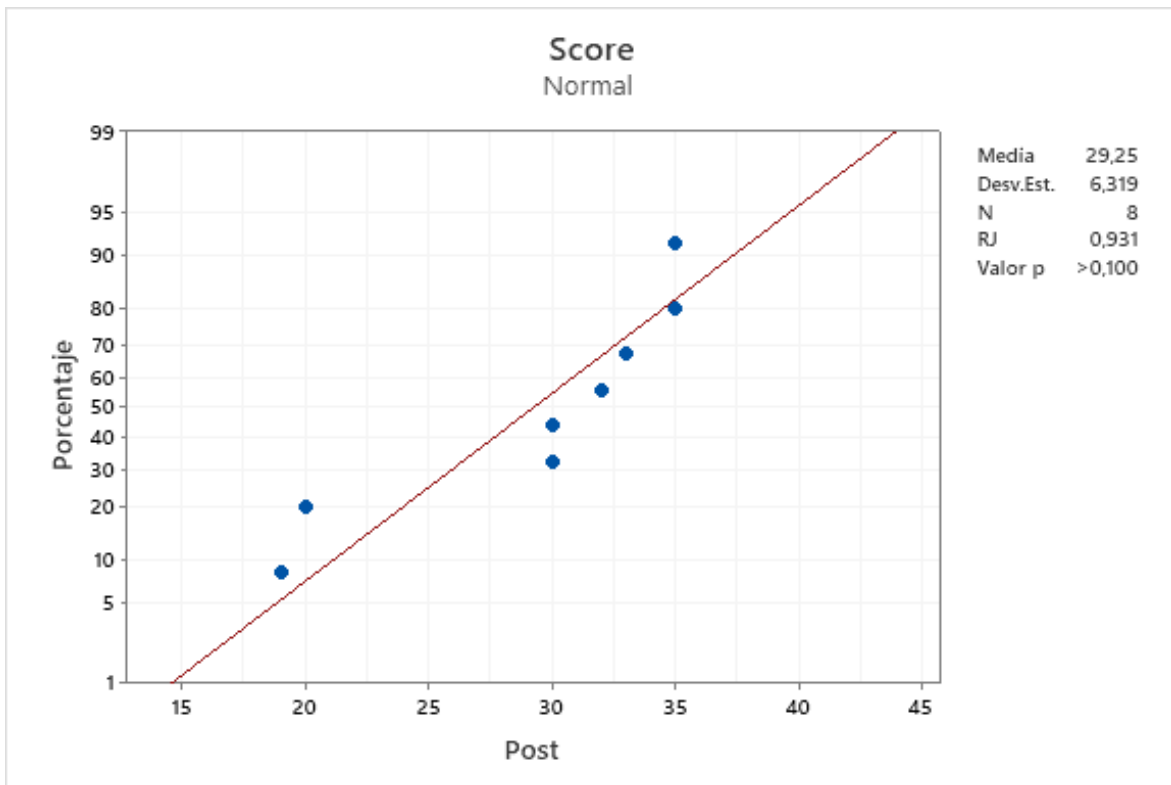
**Table 3: Results of Shapiro-Wilk Normality Test Before and After the Intervention**

The graph below illustrates the data normality behavior before the intervention.



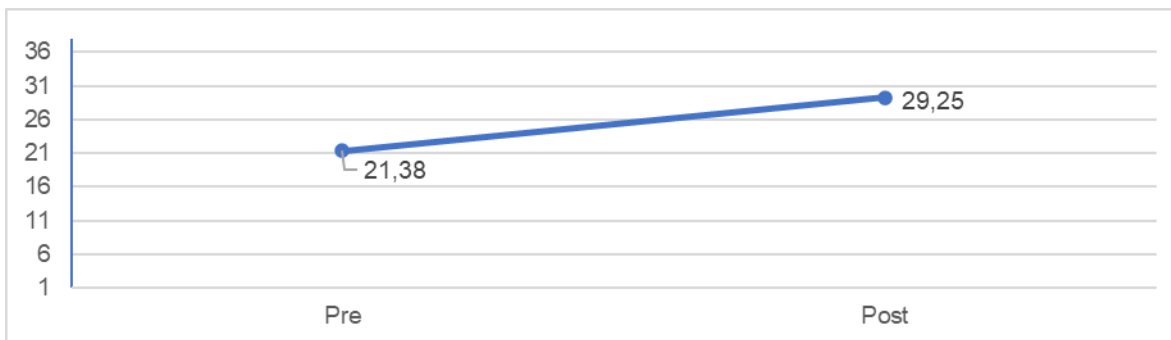
**Figure 2: Shapiro-Wilk Normality Test Before the Intervention**

The findings from Table 3 and Figure 2 evidence the data is normally distributed. The  $p$ -value is more than 0,05 ( $\leq 0,05$ ) which indicates the data behaves normally before and after the intervention, as seen in Figure 3.



**Figure 3: Shapiro-Wilk Normality Test After the Intervention**

Then the mean scores of the reading comprehension tests were analyzed after administering the Shapiro-Wilk test of normality as it is summarized before and after the intervention in Figure 4.



**Figure 4: Mean Scores Before and After the Intervention**

The sample size corresponded to 8 participants (N=8), according to Figure 4 the dots represent the overall mean scores before (M=21.38) and after (M=29.25) the intervention. Thus, the data highlights that 100% of them improved their inferential reading skills after the intervention.

#### 4.1.3 Pre-test and post-test differences by individuals

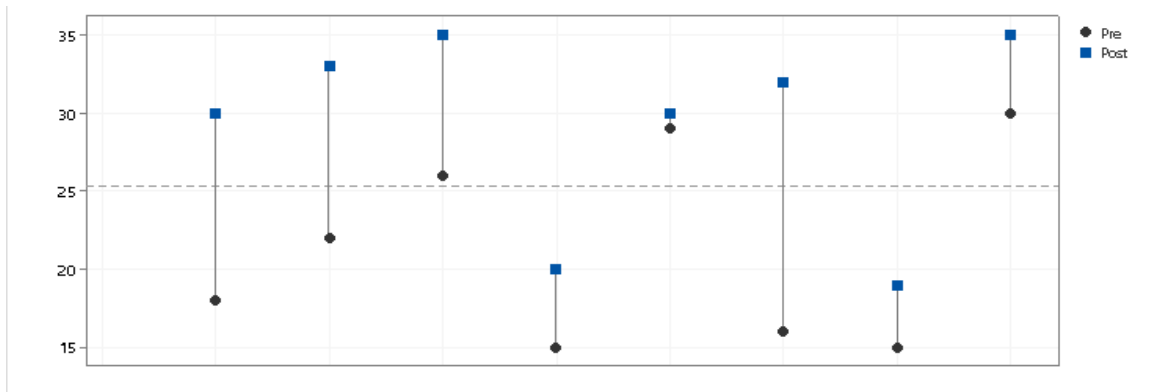
In the first place, the pretest and posttest were compared to analyze students' performance in inferential reading comprehension. Table 4 indicates the score differences between both tests by each one of the eight participants.

Participant	Pre	Post	Difference
P1	18	30	-12
P2	22	33	-11
P3	26	35	-9
P4	15	20	-5
P5	29	30	-1
P6	16	32	-16
P7	15	19	-4
P8	30	35	-5

**Table 4: Pre-Test and Post-Test Differences**

#### 4.1.4 Paired t-test for statistically significant differences each individual student

As the Shapiro-Wilk normality test indicated, the data was normally distributed, a paired-samples t-test was conducted to compare test scores before and after the intervention by each participant (See Figure 5).



**Figure 5: Paired T Test for Pre and Post Mean Scores by Individuals**

As noted in Figure 5, 100% of participants improved their scores in the posttest from 1 to 16 points. Table 5 below explains there was a statistically significant difference since all learners scored more than 50% of achievement after the intervention; contrary to their first score, in which 50% of learners did not reach 50% of achievement in inferential reading comprehension. Regarding individual differences in scores, the highest belongs to participant 6 who increased by 50 percent. Instead, participant 5 increased by only 3 percentage points being the lowest difference.

While there were score improvements in item 1 after the intervention, the most meaningful differences are reflected in item 2. In this respect, it must be emphasized that inferential questions students answered in item 1 were simpler than those in item 2, in which they were asked to additionally support their answers.

Participant	Score						Level of achievement	
	Before			After			Before	After
	Item 1	Item 2	Total	Item 1	Item 2	Total		
6	5	11	16	7	25	32	42%	84%
1	6	12	18	6	24	30	47%	79%
2	6	16	22	7	26	33	58%	87%
3	7	19	26	7	28	35	68%	92%
4	6	9	15	7	13	20	39%	53%
8	6	24	30	7	28	35	79%	92%
7	5	10	15	5	14	19	39%	50%
5	7	22	29	7	23	30	76%	79%

**Table 5: Percentage of Achievement**

Therefore, as can be seen in Table 6 below, there was a significant statistical difference between the pretest and posttest scores ( $t=4,48$ ,  $p < 0.005$ ). On average, post scores were 7,88 points higher than pre scores (95% CI).

Median	SD	t-value	p-value
-7,88	4,97	-4,48	0.003

**Table 6: Paired Difference Estimation**

It is then possible to say that participants did improve their inferential reading comprehension skills after the web-based strategy training intervention.

#### 4.1.5 Wilcoxon signed-rank test for statistically significant group differences between the pre and post tests

Despite the fact that the t-test indicated a statistically significant improvement after the intervention, the sample size was small ( $N=8$ ); therefore, to corroborate t-test results, it was regarded as necessary to run the non-parametric Wilcoxon signed-rank test to identify whether or not statistically significant differences between the pre-intervention test and the post-intervention test were maintained. The test was run at 95% confidence interval (or a 5% level of significance); (i.e.,  $\alpha = 0,05$ ), which indicates a 5% risk of concluding that a difference exists. The medians (pre and post-test ranks), the z-value and the significance level (p-value) were also analyzed.

Median		z-value	p-value
Before	After		
20	31	-2,524	0,012

**Table 7: Wilcoxon Signed-Rank Test.**

According to Table 7, the Wilcoxon signed-rank test specified that the post-test ranks were significantly higher ( $Mdn= 31$ ), ( $Z= -2,524$ ,  $p < .012$ ) than the pre-test ranks ( $Mdn= 20$ ). Since the p-value is  $< \alpha$ , the  $H_0$  is rejected and it can be claimed that there is a difference big enough to be significant. In other words, the participants' inferential reading performance after the intervention improved.

For research objective 1, it is possible to affirm that learners inferential reading comprehension skills showed a statistically significant difference after the intervention as measured by the parametric t-test and the non-parametric Wilcoxon signed-rank test.

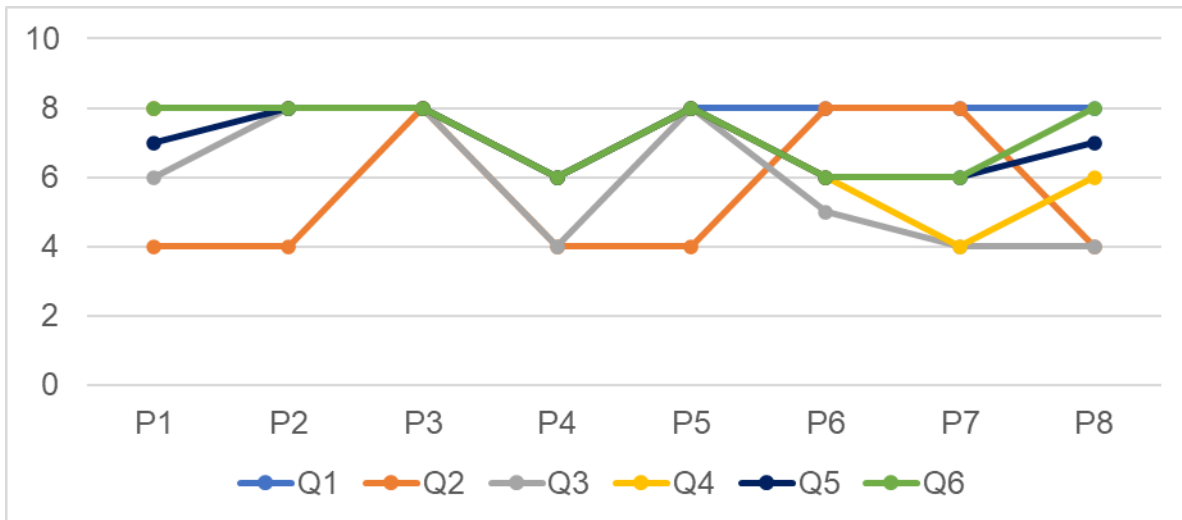
## **4.2 SO2: To assess the effectiveness of the web-based strategy training on learners' inferential reading skills after every online session.**

To describe the intervention, the web-based strategy training was developed in ten sessions of one chronological hour each, in which participants were provided with explicit strategy instruction through guided practice, independent practice, feedback and at the end of each session, there was a formative assessment (10 in total) presented in the form of an online quiz on the Wix website forms.

### **4.2.1. The QAR Strategy**

The first six sessions were devoted to the explicit instruction of Question-Answer Relationships (QAR) strategy: (1) "right there", (2) "think and search", (3) "author and me" and (4) "own my own", respectively. In those sessions, participants studied the different relationships between questions and answers. Therefore, they were taught to determine when a question is asking for explicit or implicit information.

Figure 6 below shows levels of achievement by participants in every online quiz, from "Q.1" to "Q.6".

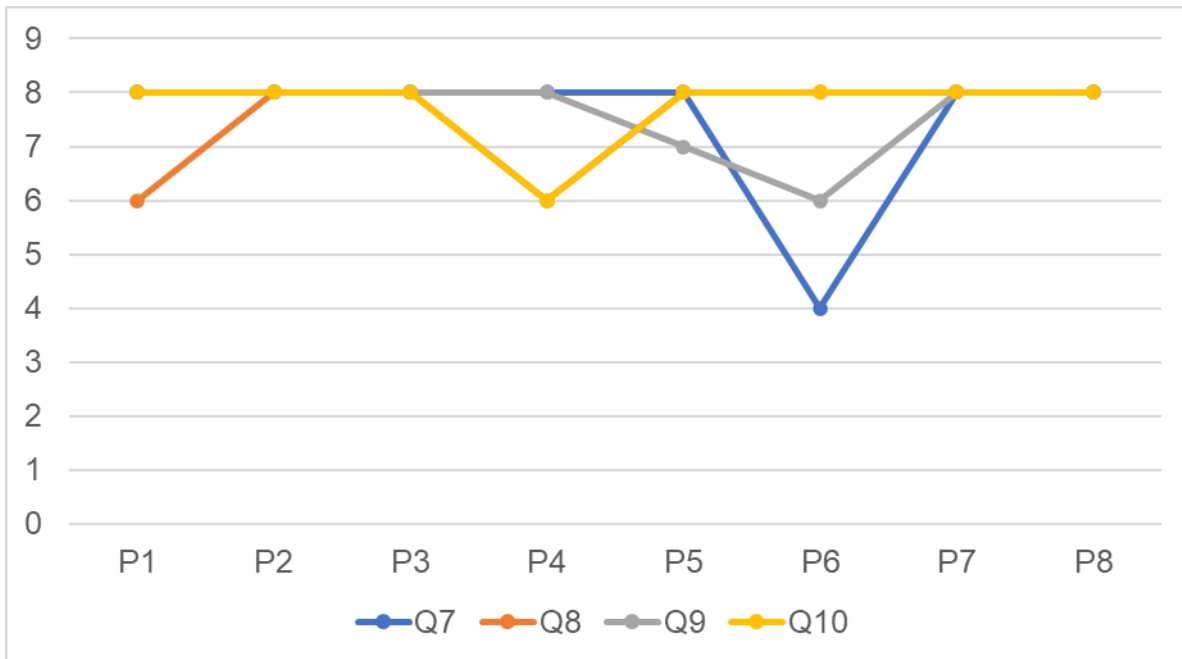


**Figure 6: “QAR” Strategy Quizzes (1-6) Results by Participants.**

The total score was 8 points for each quiz. In Quiz 1 participants were asked to read and identify explicit information through the “right there” strategy after session 1 (M=7.75, SD=0,71). In the second session (Quiz 2), “Right There” and “Think and Search”, QARs were written (M=5.50, SD=2.07). In Quiz 3 students were asked to label the four types of QARS, as Figure 6 shows, just three participants achieved the total score (M=5.88, SD=1.89). After the fourth session, participants were asked to read and classify four types of QARS in Quiz 4 (M=6.75, SD=1.49). Learners were then asked to explain the four types of QARS (M=7.00, SD=0.93) in Quiz 5. Finally, in session 6 students were asked to classify QARs (M=7.25, SD=1.04).

#### 4.2.2. The “It says, I say and so” strategy

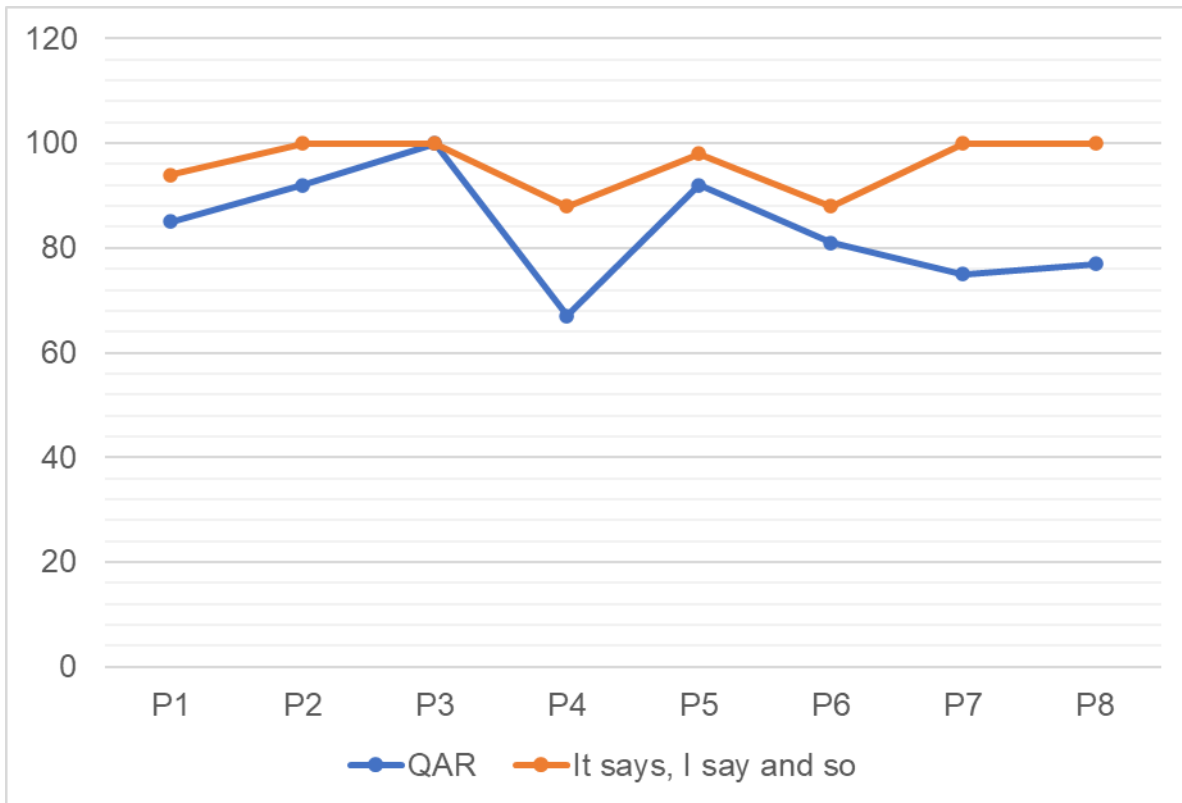
In the following four sessions (7<sup>th</sup> to 10<sup>th</sup>) the inference-making strategy (5) “It says, I say and so” was practiced as participants had to look for evidence in the text, connect the text with their background knowledge and make an inference. Levels of achievement of each participant in every quiz are noted in Figure 7.



**Figure 7: “It says, I say and so” Strategy Quizzes (7-10) Results by Participants.**

Participants were asked to read and identify clue words for their inferences (M=7.50, SD=1.41) in Quiz 7. Then in Quiz 8, they were asked to support their inferences (M=7.50, SD=0,93). In Quiz 9 students were asked to make inferences (M=7.63, SD=0.74) and in Quiz 10 learners read, made inferences, wrote clue words and the connection with their own knowledge (M=7.75, SD=0.71).

As represented in Figure 8 below, 100% of participants achieved the objectives for both strategies (QARs and “It says, I say and so”). The lowest score was 67% in the QAR strategy while 88% was scored in the “It says, I say and so” strategy. However, 100% participants improved their scores after the QAR strategy instruction.



**Figure 8: Achievement by Participants in Each Group Strategy.**

It is relevant to emphasize that, the explicit instruction of each strategy attempted to improve learners' inferential reading skills. In the first place, the QAR strategy allowed learners to know the relationships between questions and answers, to identify when an inference was needed and how to support it, as shown in Figure 8, all participants achieved favorable scores.

Consequently, the "It says, I say and so" strategy, trained learners to support their inferences with evidence from the texts and their background knowledge. One may conclude that the first QAR strategy training contributed to the second inference strategy since participants were used to discriminate between explicit and implicit information, as seen in Figure 8, most participants achieved higher scores in the "It says, I say and so" strategy.

As illustrated in Figure 8, the highest level of overall achievement was made by participant 2. Although participant 4 reached all the expected learning objectives, she had the lowest outcome.

### 4.3 SO3: To examine learners' perceptions of the inference-making strategies and web-based strategy training.

For the purpose of exploring learners' perceptions of the inference-making strategies and web-based strategy training, a Likert Scale was used, in which seven statements were included. The two dimensions were: (1) Strategies and (2) Web-based activities on Wix. The participants rated the levels of agreement they perceived with each statement in a scale of five points: (1) Strongly disagree; (2) Disagree; (3) Don't know; (4) Agree; (5) Strongly agree.

#### 4.3.1 Strategies dimension

In terms of strategies, as can be observed in Figure 9, 63% of the participants strongly agreed with using inference-making strategies in the future, while 25% agreed with that same statement and just 12% did not know, which is the equivalent of one participant. Then, 63% of them strongly agreed with having developed the ability to use the strategies to other readings, while 37% agreed with that same item. 100% of participants either strongly agreed or agreed that the strategies helped them to understand the texts. 88% strongly agreed and 12% agreed they learned what was to infer. Finally, 63% of participants strongly agreed and 25% agreed they practiced the strategies for understanding when reading and just 12% disagreed with that statement.

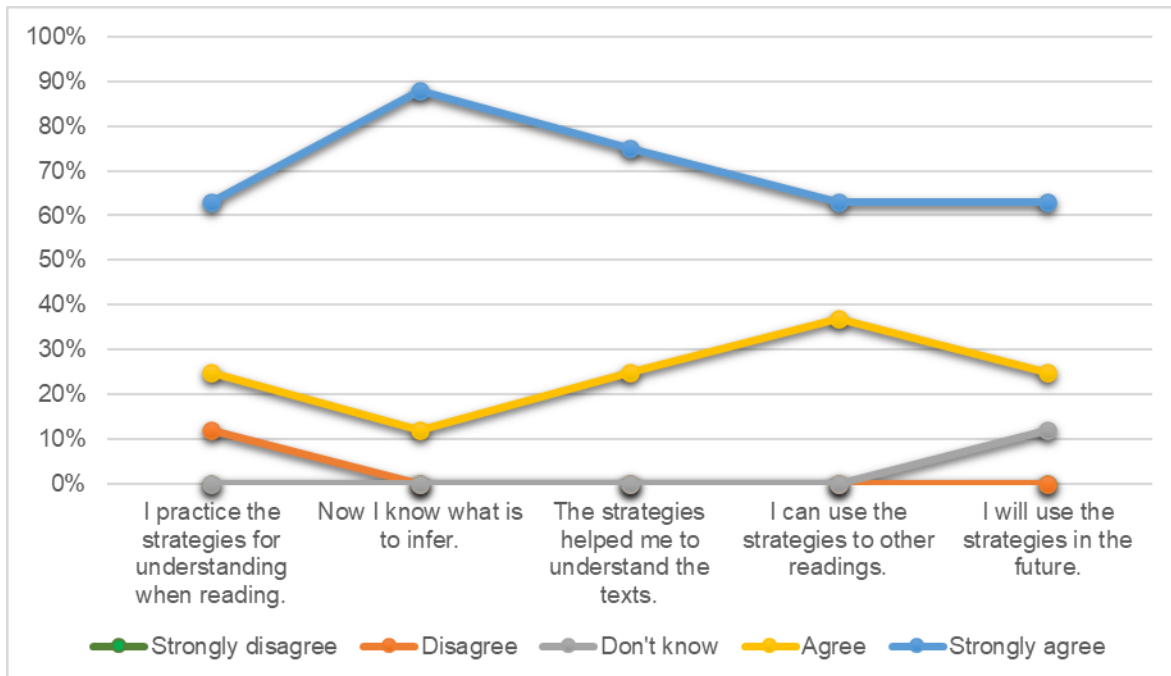


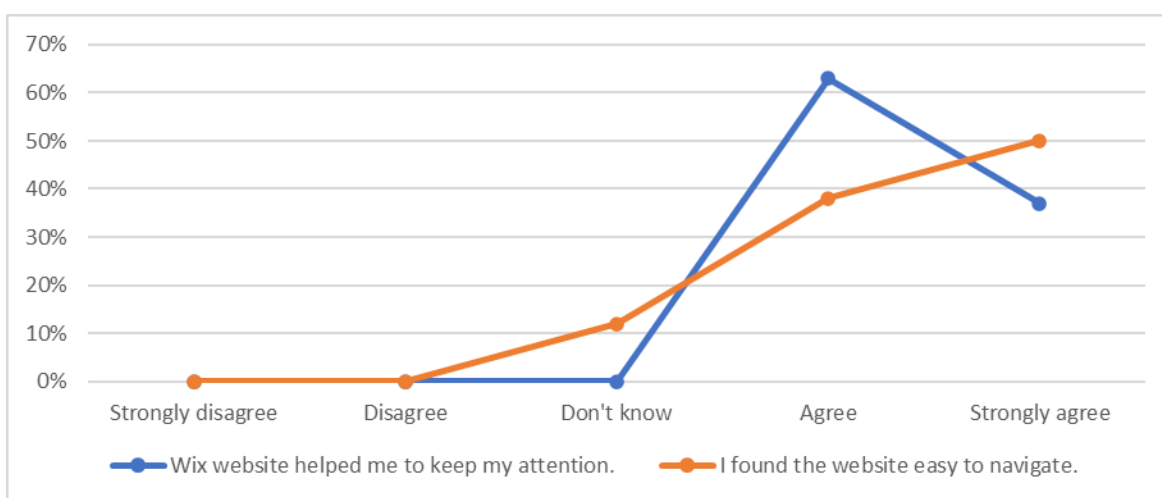
Figure 9: Participants' Perceptions About Strategy Dimension After the Intervention

As represented in Figure 9, the dimension had five statements in which there was no distinction between the groups of strategies training. Therefore, the term “strategies” refers to both “QARs” and “It says, I say and So”.

In view of the above, all participants learnt what was to infer, they believed the strategies helped them to understand the texts and they could use the strategies for other readings. In the same line, most of them practiced the strategies for understanding and would use them in the future.

### 4.3.2 Web-based activities on Wix” Dimension

Concerning the “Web-based activities on Wix” Dimension, 50% of the participants strongly agreed and 38% agreed they found the website Wix easy to navigate and just 12% disagreed with it. Secondly, 63% agreed and 37% strongly agreed the website helped them to keep their attention during the lessons.



**Figure 10: Participants’ Perceptions About Web-Based Activities on Wix After the Intervention**

It can be seen from the above that, all participants believed the Wix website created for this intervention helped them to keep their attention as most of them found the website easy to navigate. It can then be claimed that the web-based strategy training on Wix has contributed to learners’ inferential reading skills.

## **CHAPTER V: DISCUSSION**

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Reading comprehension demands more complex strategies such as inference-making to achieve overall comprehension. English language national studies indicate that most of the Chilean secondary students achieved an insufficient level of reading (Agencia de Calidad de la Educación, 2012, 2015, 2018), placing them in a lower A1 level in the CEFR. -The question in this study sought to determine what is contribution of web-based strategy training for improving learners inferential reading skills. Hence, this intervention envisaged explicit teaching of combined strategies (Question-Answer Relationship: QAR and “It says, I say and So”) through web-based activities created on the Wix website.

Although some recent studies successfully note improvement of inferential reading skills through explicit instruction of strategies (Klinger, Boardman & Vaughn, 2007; Uribe, 2015) and others by web-based activities (Johnson-Glenberg, 2005), when reviewing the literature, no data was found on the association between these strategies and web-based activities. In this way, the results will be discussed and interpreted concerning the specific objectives.

### **5.1.1 SO1: To compare learners’ inferential reading skills before and after the web-based strategy training.**

Kispal (2008) compared different beliefs related to inferences, a key finding of her review is that the ability to draw inferences predetermines reading skills, which means that poor inference-making causes poor comprehension. In the current study, it was found that the results of the reading comprehension test before the intervention showed learners had a low level of comprehension as expected. In contrast, the post-test results evidenced participants improved their inferential reading skills meaningfully since 100% increased their scores, which agree with Sadeghi, Gilani & Niyazi (2018), who found out that explicit instruction and strategy practicing improved inference-making.

It was somewhat surprising that, while findings showed improvements in item 1 (multiple-choice inferential questions), the most meaningful differences were in item 2 (open inferential questions). -In this sense, it can be inferred learners mastered the skill after the intervention since in Item 2 they had to support their answers with clues from the text and their background knowledge. Therefore, the results of the first research aim mirror those of the previous studies that have examined the effect of explicit strategy instruction on inferential reading skills (Kopitski, 2007; Lopera, 2012; Mahdi, 2016; Tan, 2018; Uribe, 2015).

### **5.1.2 SO2: To assess the effectiveness of the web-based strategy training on learners’ inferential reading skills after every online session.**

The web-based strategy training was implemented in 10 sessions, whose methodology comprised the explicit teaching of QAR and “It says, I say and so” strategies through direct teacher instruction supplemented by web-based activities

designed on the Wix website. It included written texts, images and online mini-quizzes to be answered after each session.

In the first place, online quizzes results evidenced that after the QAR instruction participants successfully answered literal and inferential and evaluative questions, which is in line with Raphael's purpose (1986), who designed this method to help learners to visualize the relationships between questions and answers. Findings on the first QAR "Right there" evidenced participants were able to answer literal questions being the highest level of achievement. -On the contrary, in the "think and search" QAR, they wrote and answered questions with explicit information from the text, being the hardest task, which can be explained by the fact this task demanded to locate information in different parts of the text and put it together to answer the questions. -On the other hand, it is interesting to note that participants performed better when labelling, classifying and explaining the different types of QARs ("right there", "think and search", "author and me" and "own my own"), which involved literal, inferential and evaluative questions. -Under the present results, previous studies have demonstrated the positive effect of QAR instruction in reading comprehension (Anggun, 2017; Baqi, 2019; Rothonh 2013).

Consistent with the literature (Sari, 2012), this research found the effectiveness of "It says, I say and so" strategy since all participants successfully made inferences when using it. -This strategy worked by training participants to remember the two components that would help them to make inferences: (1) evidence from the text and (2) their knowledge through a graphic organizer. -This result corroborates the ideas of Kopitski's (2007) findings, which showed the students needed to support their answers by using clues from the text and their background knowledge. It is possible to argue, therefore, this strategy was beneficial since participants knew the relationships between questions and answers in the first sessions.

Hence, it could conceivably be hypothesized that the combination of both strategies (Question-answer relationship "QAR" and "It says, I say and so") was effective since knowledge of QAR helped participants to support inferences when being instructed with the second strategy. The findings observed in this study mirror those of the previous studies (Barth & Elleman, 2017) that have examined the effect of multi-strategy inference instruction with a similar sample and time of instruction but not to the same strategies.

Prior studies have noted the importance of explicit teaching of learning strategies (Lee, 2013; Uribe, 2015). In this sense, students succeed adopting both strategies, which confirms that explicit teaching helps learners to become conscious of the strategies and use them more effectively. -It can be inferred the results above might be related to lesson structure, since the sessions were delivered to small groups of students, which could have contributed to their self-confidence and willingness to work collaboratively. Another possible explanation for this is that participants were provided with feedback and formative assessment in every session. These findings corroborate the ideas of Hall & Barnes (2016) and Westwood (2003), who suggested that each lesson should have a review of the

previous one, modelling, guided, independent practice, feedback and application stages, which was the methodology this intervention followed.

In this study, it was found that the results of the online quizzes evidenced learners' inferential skills progress, which is in agreement with García-Herreros (2020) findings, that showed a successful use of web-based tools to foster inference to improve students' reading comprehension. –However, this finding differs from Dehghanpour & Hashemians (2015) since they stated inferring strategy was difficult for the participants in comparison to other strategies.

### **5.1.3 SO3: To examine learners' perceptions of the inference-making strategies and web-based strategy training.**

Another important finding is that learners' perceptions support the contribution of web-based strategy training to learners' inferential reading skills. Regarding the dimension of inference-making strategies, most of the participants, stated after the intervention, they knew the concept of inferring, they believed the strategies helped them to understand the texts, they realized that they could use them in other texts and considered to use inference-making strategies in the future. These results agree with the findings of other studies, in which strategy instruction was considered useful because it facilitated the understanding of the readings (Lopera, 2012) and helped to make inferences (Kopitski, 2007).

Regarding perceptions of the web-based activities dimension, findings evidenced that participants believed the site was easy to navigate and it kept their attention to the sessions. This also concurs with earlier studies, in which perceptions about web-based reading comprehension activities were examined (Gómez, Pineda & Marín, 2012; Dehghanpour & Hashemian, 2015). It seems possible that these results are due to the fact participants' interests, characteristics and topics preferences were taken into consideration when designing the web-based activities on Wix (Rativa, Pedreros & Nuñez, 2012). Therefore, those perceptions can be explained by participants' motivation, commitment, and active participation during the whole process.

## **5.2 Limitations and implications**

Given this study was action research aimed to solve a particular teaching-learning problem identified in a particular context, findings cannot be generalizable. Therefore, it would be a contribution for those teachers who want to innovate instruction towards the improvement of secondary students' inferential reading skills through explicit teaching of strategies and/or the incorporation of web-based activities for the strategy training.

This study provides new insights into the benefits of the explicit instruction of strategies that provide learners with knowledge of the relationships of questions and answers (QAR) as the foundation for “It says, I say and so” instruction to make

inferences and the incorporation of web-based strategy training to develop inferential skills.

Although this study was expected to be implemented on site lessons classes, it was carried out online through the platform Google Meet by the pandemic, though it did not mean a limitation for the research but rather it was an opportunity to deliver a better instruction to participants since they were taught in small groups in different sessions. The latter fostered intense feedback together with personalized support throughout the lessons.

Since this research was conducted with 8 participants, it would be highly beneficial to implement web-based strategy training in larger classes. Based on these findings, the following suggestions for ESL and EFL teachers are presented as follows.

1. This research indicated that learners should be instructed with explicit teaching of strategies since learning strategies allows students to take control of their learning. –Therefore, instruction should imply a lesson structure that includes teacher’s strategy modeling, guided, independent practice, application, feedback and formative assessment.
2. The analysis of results concluded that the combination of strategies contributes to the improvement of learners’ inferential reading skills since the first strategy training (QAR) helped learners to identify and answer inferential questions effectively as they gained knowledge of the relationships between questions and answers. This impacted positively when adopting the second strategy (It says, I say and so), which strengthened the inference skill as reflected at the end of the intervention.
3. Findings evidenced that teachers should innovate instruction through the incorporation of web-based activities. To effectively support teaching, the design of web-based strategy training activities implies knowing in advance learners’ characteristics and interests when selecting reading activities.

Although the generalizability of the current results must be established by future research, the present study has provided clear indications for the improvement of learners’ inferential reading skills through web-based strategy training.

## **CHAPTER VI: CONCLUSION**

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### **6.1 Summary of the main findings**

The present study was designed to explore the contribution of web-based strategy training on learners' inferential reading skills. In relation to the first research objective, findings evidenced participants improved their inferential reading skills after the intervention. Regarding the second objective, findings demonstrated that the web-based strategy training on learners' inferential reading skills was effective. In connection with the third objective, students' perceptions indicated a positive attitude to the web-based activities and valued the contribution of the strategy training to achieve an overall comprehension of the texts.

In the first place, although inferring could be a difficult task, learners are still able to develop it effectively, if the instruction and materials are appropriate to their characteristics regardless of their level of English. The instruction of QAR helped learners to understand they were expected to answer different types of questions and identified when an inference was needed and the "It says, I say and so" strategy helped to understand they needed to support their inferences by using clues from the text and to connect the text to their background knowledge.

In the second place, the explicit teaching of strategies impacts positively on learners' attitudes towards reading, if the instruction devoted includes a clear modeling from the teacher, guided and independent practice, formative assessment and feedback. Students' perceptions indicated they became aware and active of their learning throughout the study.

In the third place, technology offers us a wide range of opportunities to innovate our teaching, to design attractive materials and to consider learners' interests and characteristics is suggested, therefore. Participants had positive perceptions of the website as a means of strategy training with the written texts.

This study makes a valuable contribution towards the combination of explicit teaching of strategies with the support of web-based activities, which may be a helpful methodology for ESL/EFL teachers. -Therefore, it can be suggested that the integration of explicit teaching of strategies complemented with web-based training activities may lead struggling readers to develop inference making skills and, as a result, to achieve overall reading comprehension.

## **6.2 Personal Reflection**

Conducting this action research has increased the level of my professional competency in different ways. In this sense, I have developed a critical mindset towards the improvement of instruction, learner capacities and innovation for teaching. On the other hand, this study has been a valuable way to extend my teaching skills and gain more understanding as a teacher and of my students.

In the language teaching field, there is a tendency to mainly focus on the development of lower cognitive skills when teaching low-proficiency learners. However, through action research teaching it can be done better by developing new ideas and alternatives to challenging students.

The components of this methodology, namely, explicit strategy instruction, Inference, QAR, “It says, I say and so”, and web-based activities have been supported by previous research on the field of reading comprehension. Nevertheless, no data was found on the association between them. As a result, this study suggests that the combination of strategies with the incorporation of web-based activities improved learners’ inferential reading skills.

Secondly, to know in advance participants’ interests to keep their attention during the whole process and to fit lessons contents into participants’ characteristics were beneficial since they seemed motivated with the topics chosen for the written texts.

## **6.3 Recommendations**

The web-based strategy training on inferential reading skills was applied to secondary students with a low proficiency level of English language effectively. Given long-term improvement and significant learning, it would be advisable to replicate this study with a bigger sample and for a longer period to confirm the effectiveness of web-based strategy training on learners’ inferential reading skills in large classes. Although it was found that participants in this study were willing to use the strategies in the future, it would be relevant to find out if they continue using the strategies autonomously.

Besides, it would be interesting to study the effectiveness of this methodology with longer pieces of reading materials, since short texts were used in the strategy training. Furthermore, teachers should take into consideration learners’ topics of interest when reading in advance to assure motivation and willingness to participate.

Further research is needed to establish the effects of this methodology with students with learning special needs since the findings evidenced web-based activities helped learners to keep their attention during the lessons and previous QAR strategy studies indicate their effectiveness with SEN students to improve reading comprehension.

## **CHAPTER VII: REFERENCES**

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# **APPENDICES**

**APPENDIX A.1**

**READING COMPREHENSION TEST**



READING COMPREHENSION TEST  
INFERENCE SKILLS

Student's name: .....		
Date: .....	Class: .....	Score:..... / _____
Objective: To identify the level of inferential comprehension of the following inference items: Location, time, action, instrument, category, object, cause-effect, problem-solution - feelings and attitude		

- I. MULTIPLE CHOICE ITEM: Read the paragraphs and choose the best alternative for each question.  
(1 point each).

I.1 Read the paragraph and infer how the character is feeling.

Pablo went camping for the first time. There was a very loud sound in the woods.

- a) mad                      b) scared                      c) happy                      d) sad

I.2 Read the paragraph, Where is the narrator in the story?

I sat in my seat excitedly watching the man swing from pole to pole. Far under him 2 elephants carried ladies with feathers in their hair. I ate my popcorn as I watched 8 clowns pile out of a tiny car.

- a) At the dentist      b) at the circus      c) at the bowling alley      d) at the beach

I.3 Read the passage below. Who is the narrator in the story?

I begin the day with my small tools to clean my patient's teeth. I placed the paper bib on her and shined a light down so I could see. I found one cavity! After all the teeth were cleaned, I gave her a toothbrush.

- a) A cashier      b) a clown      c) a teacher      d) a dentist

I.4 Read the paragraphs below. What time does the story take place?

My mother told me that I had to take out the trash. I put on my coat and mittens and grabbed a flashlight. I flipped on the porch light and headed out to put the trash bags at the curb.

- a) Daytime/summer      c) Daytime/winter  
b) Night-time/summer      d) Night-time/winter

I.5 Read the sentence and choose the inference that would be best.

He cooks food all day long.

- a) He works in a clothing store.  
b) He works in a restaurant.  
c) He works at the zoo.

II. OPEN QUESTIONS: Read the following paragraphs. Answer the questions. (2 points each).

II.1 Read the paragraph. How was the character feeling?. Answer the question.

Nancy jumped out of bed. She was ready to start the day. "Today is," she shouted, "my birthday". When she entered the kitchen, she saw the table decorated with balloons and streamers.

How was Nancy feeling?

.....

II.2 Read the paragraph, think what place the narrator is in the story.

As I walked in the door, I was amazed at the beautiful colors and smells. I knew it would be hard to decide what I would buy with my \$3. The chocolate truffles looked delicious, but they were expensive. The jelly beans were not only cheaper, but so colorful! With so much to choose from, I knew I would be here a long time.

Where is the narrator?

.....

2.3 Read the following paragraph and answer the questions below.

Cristina woke up early and ran down the stairs with a huge smile on her face. She had been waiting all night for Saturday to arrive. She ran into the kitchen. On the table was a large pile of hot, steaming flapjacks with a candle in them. Dante, Cristina's brother, walked in holding a large box wrapped in pretty pink paper and tied with a shiny, purple bow. Cristina beamed and quickly tore off the paper to reveal a box with a beautiful doll on the side. She hugged and kissed her brother and ran to call her best

a) What do you think Cristina was waiting for all night?

.....

b) How do you think Cristina felt when she woke up?

.....

c) Why do you think Cristina's brother gave her the gift?

.....

2.4 Read the paragraph and answer the questions below.

Every day after work Ignacio took off his muddy boots on the steps of the front porch. Lorena would have a fit if the boots made it so far as the welcome mat. He then removed his dusty overalls and threw them into a plastic garbage bag. Lorena left a new garbage bag tied to the porch railing for him every morning. On his way in the house, he left the garbage bag by the washing machine and took a shower as instructed. Ignacio would eat dinner with Lorena after he was "presentable," as she often said.

2.4.5 Where does Ignacio work?

- a) In an office building
- b) In a grocery store
- c) In a car dealership
- d) In a cemetery

2.4.6 Why do you believe this? Refer to the text in your answer.

.....  
.....

2.4.7 Which most likely describes Ignacio and Lorena's relationship?

- a) They are best friends.
- b) They are brother and sister.
- c) They are husband and wife.
- d) They are mother and son.

2.4.8 Why do you believe this? Refer to the text in your answer.

.....  
.....

**APPENDIX A.2**  
**MINI ONLINE QUIZ SAMPLE**

ONLINE QUIZ SAMPLE  
(QAR Strategy practice on Wix)

Objective : To make inferences when reading.  
Instructions : Read the text and submit your answers.

1. Why does Colin need that job?

The answer to this question is “right there” in the text.

2. What does Colin’s expression mean?

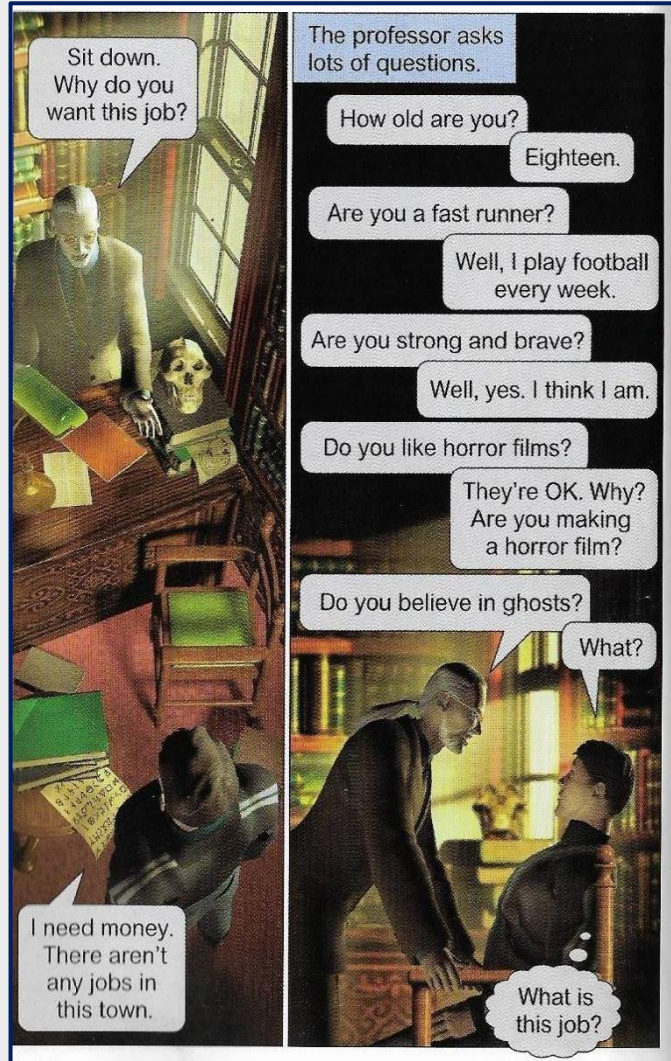
To answer this question, you must think about what you know, what the author says, and how they fit together.

3. How did Colin feel about the conversation? Why do you think that way?

“Think and search” about this question and you’ll find the answer. It is there in the text, but you may have to search for it.

4. What is the job about? What makes you think that way?

The text can’t help you answer this one. You must use your experience and opinions and answer this question “on your own”.



*Shipton, P. (2008). Vampire killer. Oxford: Oxford University Press.*






**APPENDIX A.3**  
**LIKERT SCALE**



### LIKERT SCALE

Objective: To examine participants' perceptions of inference-making strategies as well as, the use of web-based strategy training.

Instruction: Read the following statements. Place an X in the appropriate option to indicate your opinion about the explicit instruction of strategies for inference-making and the use of web-based strategy training.

	Student perceptions	Strongly agree 	Agree 	Don't know 	Disagree 	Strongly disagree 
Inference-making strategies	1. I practice in the strategies for understanding when reading.					
	2. Now I know what is to infer.					
	3. The strategies helped me to understand the texts.					
	4. I used and applied the strategies to other readings.					
	5. I will use the strategies in the future.					
Wix Website strategy training	6. Wix website helped me to keep my attention.					
	7. I found the website easy to navigate.					

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