

Reading Comprehension and Vocabulary Acquisition in the EFL Classroom

*Compiled by María Guadalupe García
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CHAPTER 1

What Reading Comprehension Strategies Do 6th Graders from a Bilingual Section of a School in Montelibano Use to Understand Science Texts?

María Paula Vélez Rodríguez

Resumen

El presente estudio se basa en la identificación de estrategias de lectura utilizadas por los estudiantes para comprender textos científicos. En algunas oportunidades las áreas trabajan de una forma aislada y manifiestan que los estudiantes no saben leer y de la baja comprensión de lectura que presentan frente a textos científicos. He aquí la importancia de saber e identificar las diferentes estrategias que utilizan y prefieren los estudiantes para entender lo que leen.

Alumnos de sexto grado presentan dificultades en la comprensión de lectura ya que no entienden algunos conceptos científicos, presentan carencia de estrategias de lectura que puede afectar varias áreas y procesos como la escritura y el lenguaje ya que pueden sentirse incómodos al momento de participar en clase y esto conllevaría un atraso en el proceso de aprendizaje.

Para encontrar una solución al problema presentado anteriormente es necesario conocer las estrategias de lectura usadas por los estudiantes para entender aquellos conceptos que no comprenden en los textos científicos.

El colegio escogido para la realización del presente estudio está ubicado en Montelibano, Córdoba. Es una institución privada que pertenece a

una compañía minera. El colegio es mixto, tiene una sección bilingüe y la población es multicultural.

El documento de investigación está organizado en nueve secciones que incluyen la descripción del problema, la pregunta de investigación, objetivos, marco teórico, metodología, resultados, discusión, conclusiones y apéndices.

Palabras clave

Estrategias de lectura, estrategias de comprensión, estrategias cognitivas, estrategias de compensación, estrategias afectivas, estrategias sociales, textos científicos.

Abstract

The present study focuses on identifying reading comprehension strategies that students use to understand scientific texts. Content areas sometimes work separately and complain about the way students read and the low level of comprehension they have of scientific texts. Hence the importance of knowing the way learners prefer to read and better understand what they read.

6th graders have problems in reading comprehension because they don't understand some scientific concepts. They lack different reading strategies and the problem might also affect other areas such as writing and speaking because they feel uncomfortable participating in class and therefore they will not understand future topics.

To find a solution to the problem stated above it's necessary to know the strategies the students use to understand concepts, the strategies they use when they read scientific literature and the strategies the teachers use to explain how to read.

The school chosen for this study is located in Montelíbano, Cordoba; the institution belongs to a Mining Company so it's a private school. The school has a Bilingual section, urban and co-educational. One important characteristic to be mentioned is that it has a multicultural population.

The research is organized in the following nine sections that include the description of the problem, research questions, objectives, theoretical framework, methodology, results, discussions, conclusions and appendices.

Key Words

Reading strategies, Comprehension strategies, Cognitive strategies, Compensation strategies, Metacognitive strategies, Affective strategies, Social strategies, Content area, and scientific text.

1. Introduction

The present study focuses on identifying reading comprehension strategies that students use to understand scientific texts. Content areas sometimes work separately and complain about the way students read and the low level of comprehension they have of scientific texts hence the importance of knowing the way learners prefer to read and better understand what they read.

6th graders have problems in reading comprehension because they don't understand some scientific concepts, they lack different reading strategies and the problem might also affect other areas and also their writing and speaking can be affected because they feel uncomfortable participating in class and therefore they will not understand future topics.

To find a solution to the problem stated above it's necessary to know the strategies the students use to understand concepts, the strategies they use when they read scientific literature and the strategies the teachers use to explain how to read.

The school chosen for this study is located in Montelibano, Cordoba; the institution belongs to a Mine Company so it's a private school. The school has a Bilingual section, urban and co-educational; one important characteristic to be mentioned is that it has a multicultural population.

The 6th graders classroom of the Bilingual section has 19 students, 8 boys and 11 girls between 11 and 12 years old. They have a high social and economic level. It's a multicultural classroom where the parents accompanied them in their learning process.

The research is organized in the following nine sections that include the description of the problem, research questions, objectives, theoretical framework, methodology, results, discussions, conclusions and appendices.

2. Research Problem

- › Students' don't understand science concepts easily.
- › Students have problems understanding science texts.
- › Both teachers and students are involved in the problem.
- › Most of the time, the students don't understand the concepts when they begin a new topic or lesson and they have to do a reading.

2.1 Research Questions

What reading comprehension strategies do 6th graders from a Bilingual Section of a School in Montelibano use to understand science texts?

- › Why do they use those specific strategies?
- › Which strategies do they prefer?

2.1.1. Objectives

2.1.2 General Objective

Identify what reading comprehension strategies do 6th graders from a Bilingual Section of a School in Montelibano use to understand science texts.

2.1.3 Specific Objectives

- › Explain why 6th graders from a Bilingual Section of a School in Montelibano use those specific strategies to understand science texts.
- › Identify the strategies that 6th graders from a Bilingual Section of a School in Montelibano prefer when they read science texts.

3. Theoretical Framework

Reading strategies are defined as learning techniques, behaviours, problem-solving or study skills which make learning more effective and efficient (Oxford and Crookall,1989). Singhal (2001) states that

comprehension or reading strategies on the other hand, indicate how readers conceive a task, how they make sense of what they read, and what they do when they do not understand. In other words, they are different methodologies used by students to understand better and solve difficulties during the reading in an effective way.

Barnett (1988) calls reading strategies the mental operations involved when readers approach a text effectively and make sense of what they read. Pearson and Gallagher (1983) identify better readers as having better ability to summarize and make effective use of background knowledge. It is possible to say, that better readers take the text and cover it all using different ways or methodologies of reading and they are conscious of the way they are reading, evaluating their process This could make the difference between a good reader and another that has difficulties in that specific skill.

Hosenfield (1977) identifies a good reader as one who tries to keep the meaning of the passage in mind, reads in chunks, ignores less important words, tries to guess the meanings of unknown words using contextual clues, and has a good concept of himself/herself as a reader. Following these studies, there have been attempts to instruct learners in using these strategies to make them better readers (Carrell, 1989; Block, 1992; Victori & Lockhart, 1995). These studies show a positive correlation between reading strategy instruction and reading proficiency.

Although a number of studies have attempted to conceptualize the notion of strategies used by language learners, as stated, Oxford (1990) offers a useful and comprehensive classification scheme of the various strategies used by learners. Within the context of reading strategies, the following six strategies can more appropriately be referred to as sub-strategies in the article written by (Singhal, 2001).

Cognitive strategies are used by learners to transform or manipulate the language. In more specific terms, this includes note taking, formal practice with the specific aspects of the target language such as sounds and sentence structure, summarizing, paraphrasing, predicting, analyzing, and using context clues. Techniques that help the learner to remember and retrieve information are referred to as **memory strategies**. These include creating mental images through

grouping and associating, semantic mapping, using keywords, employing word associations, and placing new words into a context.

Compensation strategies include skills such as inferring, guessing while reading, or using reference materials such as dictionaries.

Metacognitive strategies are behaviors undertaken by the learners to plan, arrange, and evaluate their own learning. Such strategies include directed attention and self-evaluation, organization, setting goals and objectives, seeking practice opportunities, and so forth.

Affective strategies such as self-encouraging behavior, to lower anxiety, and encourage learning. Lastly, **social strategies** are those that involve other individuals in the learning process and refer to cooperation with peers, questioning, asking for correction, and feedback; for example, while reading, a student may ask another individual for feedback about his/her reading responses (Singhal, 2001, p. 2,3).

It is important to recognize that the above strategies can be used to facilitate learning, or can be used to facilitate comprehension.

According to the many strategies offered from different authors including the ones mentioned in this study, teachers have to provide these options to students. The idea is to let them know that there are many ways in which they can learn to read and more over to understand what they read; this is not a one day process it takes longer but the results would be seen. Content areas are very good option to integrate reading skills because reading is not only the concern of language areas.

Bowers (2000) expresses that reading scientific texts is sometimes difficult for students; the teaching of science concepts combined with communications skills is an approach whose time has come for two major reasons:

First, there is a general recognition of the need to make instruction meaningful and relevant to the real world of students. There is a fine array of children's literature available today that teachers can use to introduce their students to the world in which they live and, concom-

itantly, to teach reading skills in a meaningful context. The vicarious experiences children have through excellent literature not only can be used to teach reading and writing skills in context, but can also be used to help students see themselves in what they read—which is very motivating. This meaningfulness and real-world approach has been shown to significantly enhance students' comprehension of what they read. To increase their self-esteem and sense of self-worth, all students, regardless of gender or ethnicity, need to see themselves reflected in what they read and study in school. The wide variety of high quality literature available today helps to accommodate this need; careful selection of what is to be read helps to assure that students can relate to what they are reading and, therefore, make it meaningful to their own reality. (Bowers, P, 2000, p.1).

According to Anderson and Roth (1989) cited by Chan and Sachs (2001), “understanding science is difficult because new information often appears incompatible with what students know”. Students tend to let their prior knowledge override text information and assimilate new information to what they already knew, often resulting in alternative conceptions. The beliefs that learning involves thinking and that it is extendible seem particularly relevant for scientific understanding that involves sense-making constructive learning activities (Chan, C. & Sachs, J, 2001).

Because of this reason, teachers have an important mission that consists of explaining to learners what learning is about. The use of the same strategy makes the students limit their learning capacities and it will be harder for them to get really involved in the process of constructing knowledge and learning.

Sometimes teachers just begin presenting information to students without taking into account what they “think”. Knowledge is very complex and the way we present it is different from the way others receive it. For this reason, it's very important to know the students beliefs about the way they learn and that has to be also with understanding scientific text, especially because those readings use a different terminology and most of the time concepts that students don't use frequently. It will be a good idea to analyze the way our students learn to learn and then begin

guiding them through the constructivist methodology. By identifying their reading strategies and preferences in this topic, it will be easier for both teachers and students to develop the process and improve in reading skills, in this case scientific texts.

4. Methodology

The methodology chosen for the research project is Ethnography. Ethnography is literally the description of culture (or of group of people that are perceived as possessing some degree of cultural unity). Ethnographic research can be done in different ways and for different purposes. So long as the basic principles are not violated, a wide variety of tools and methods can be employed, in isolation or in combination. (Van Lier, 1988, p.8)

The purpose of the present study is to describe the behaviour of a group in relation with the reading strategies 6th graders use to understand scientific texts, identifying what the participants are doing according to a specific process (reading) in a current situation.

Using Ethnography, a qualitative or descriptive research, it's possible to observe the classroom as it is without a different intervention that might interfere in the research. It is also possible to interpret what the participants of the study do according to the research question.

“Qualitative research is a useful approach wherever an investigator is concerned with discovering or describing second language acquisition”, in this case with one of the skills. Also a descriptive research in this case provides descriptions of naturally occurring phenomena connected with language development and processing. The procedures and methods associated with qualitative research have increasingly been incorporated into second language research in recent years because they give the possibility to explain different aspects of the research that are not possible through experimental research. (Selinger & Shohany, 1989, p.80)

According to the research question, the most appropriate techniques of data collection area survey (Appendix 1), an analysis of products

(Appendix 2) and an interview (Appendix 3). It's important to have the three sources of information so they will complement each other and follow the process of triangulation. The use of two or more methods of data collection in the study of some aspect of human behaviour may be defined as triangulation, it is also called the multi-method approach. (Cohen & Manion, 1994, p. 100).

Surveys and questionnaires are useful for collecting data from large groups of subjects. The items on surveys and questionnaires may vary in the degree of explicitness and specificity (Selinger & Shohany, 1989, p.10).

In the current research the survey was applied to 19 students (the whole class), while the interview and the analysis of product was applied only to 4 students, 2 boys and 2 girls, so it is possible to analyze the results in depth. The four students were chosen based on their scores in the science subject (2 with high level and 2 with low level).

The analysis used for this research was done following some steps. For the survey analysis, all the questions were tabulated and the information was organized in tables according to the categories mentioned in the theoretical framework considering the strategy and the frequency of use. Bar graphs for each table were constructed including the results of each category and the specific strategies of each one. To organize the results for question 7 where the participants had to choose their four favourite strategies inside the survey, the data was organized using another table and a graph showing the most relevant answers.

For the interview analysis, the interviews were transcribed and organized in separate tables, one for each student. The information from the interview was categorized according to the six categories mentioned in the theoretical framework. Only one emergent category for the present study appeared. This was rereading that refers to the return to the beginning of a sentence or paragraph and read it again (Rasinski & Padak, 1996, p. 67).

In this particular case, rereading appeared as an emergent category because it wasn't considered inside the theoretical framework.

The number of times a category appeared during the interview was counted for each student. Taking into account the frequency a strategy appeared during each interview, a bar graph was constructed to see the most frequent strategy the participant used.

5. Results

In the following section, the data evidenced in the survey is presented in tables according to the frequency of use of the strategies (Appendix 4) and a description of the results found in the interviews (Appendix 5).

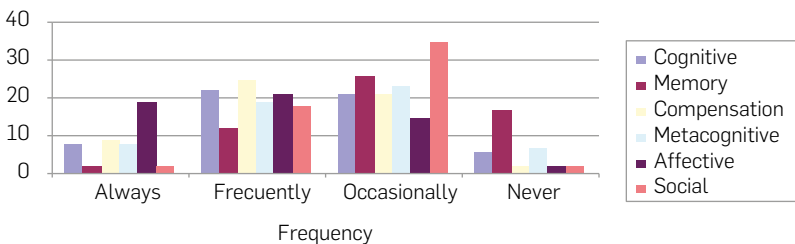
Survey

General Results:

Table 1 (General results)

Frequency Strategies	Always	Frequently	Occasionally	Never
Cognitive	8	22	21	6
Memory	2	12	26	17
Compensation	9	25	21	2
Metacognitive	8	19	23	7
Affective	19	21	15	2
Social	2	18	35	2

Figure 1 (General Results)



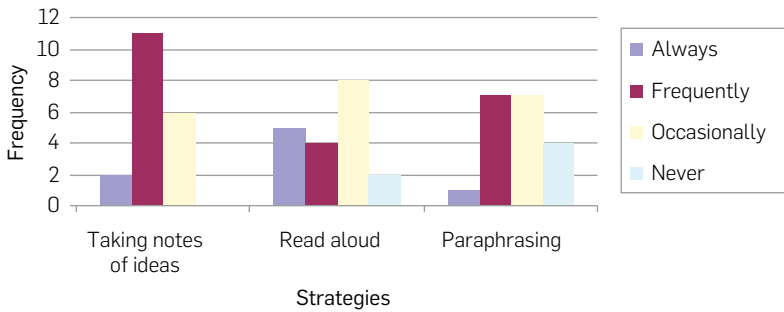
Most of the participants chose the affective strategy as one of their favourites and most used. The less used strategy by the participants was the memory strategy, only two of the students say that they use this strategy always and 12 said occasionally.

Cognitive Strategies:

Table 2 (Cognitive strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Taking notes of main ideas	2	11	6	0
Read aloud	5	4	8	2
Paraphrasing	1	7	7	4

Figure 2 (Cognitive Strategies)



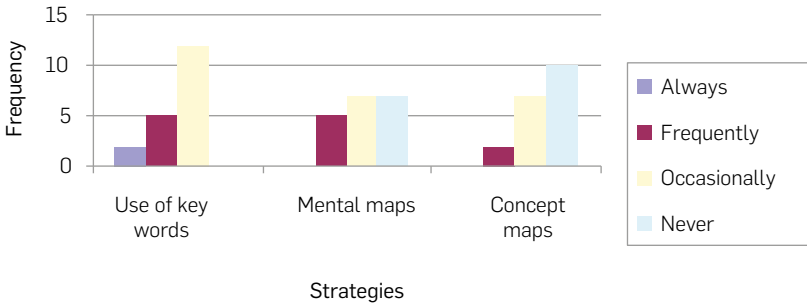
Inside the cognitive strategies, participants chose reading aloud as one of the most used; taking notes also apply, while paraphrasing is always used only by 1 participant.

Memory Strategies:

Table 3 (Memory strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Use of key words	2	5	12	0
Mental maps	0	5	7	7
Concept maps	0	2	7	10

Figure 3 (Memory strategies)



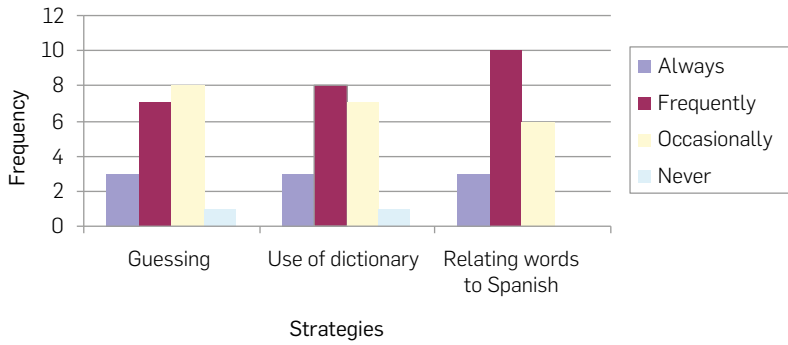
Memory strategies are not used very much by the participants, more than a half of the participants never use concept maps, and 11 occasionally use key words as a strategy.

Compensation Strategies:

Table 4 (Compensation Strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Guessing	3	7	8	1
Use of dictionary	3	8	7	1
Relating words to Spanish	3	10	6	0

Figure 4 (Compensation Strategies)



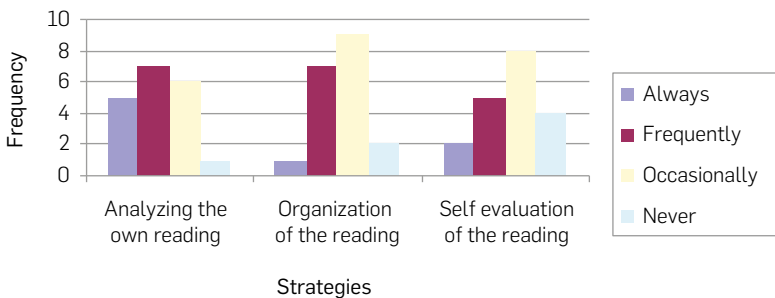
Compensation strategies appeared with a low frequency use, only 3 participants use at least one of the strategies always, the strategy most frequently used inside this category was relating words to Spanish.

Metacognitive Strategies:

Table 5 (Metacognitive strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Analyzing their own reading	5	7	6	1
Organization of the reading	1	7	9	2
Self-evaluation of the reading	2	5	8	4

Figure 5 (Metacognitive Strategies)



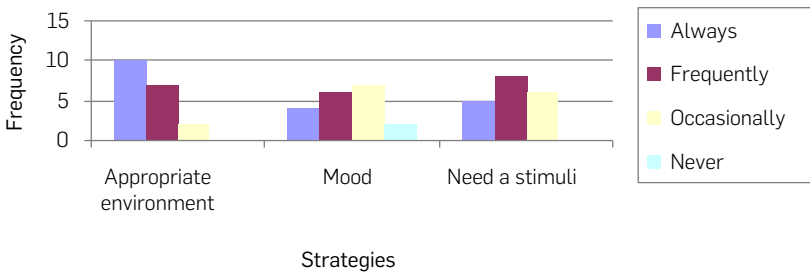
The category of metacognitive strategies is one of the less used with the memory category. Only 4 of the participants analyse their own reading, only one organizes the reading and 4 never evaluate themselves while reading.

Affective Strategies:

Table 6 (Affective strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Appropriate environment	10	7	2	0
Mood	4	6	7	2
Need a stimuli	5	8	6	0

Figure 6 (Affective strategies)



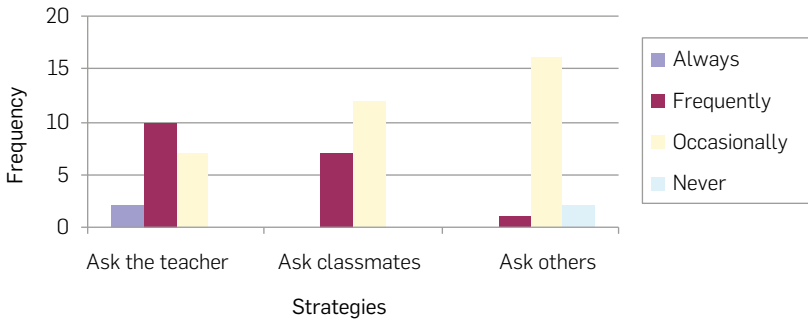
According to the affective category results, more than half of the participants need always an appropriate environment to read. 4 need to be always in a good mood and 5 need most of the time a positive stimuli.

Social Strategies:

Table 7 (Social strategies)

Frequency Strategies	Always	Frequently	Occasionally	Never
Ask the teacher	2	10	7	0
Ask classmates	0	7	12	0
Ask others	0	1	16	2

Figure 7 (Social strategies)



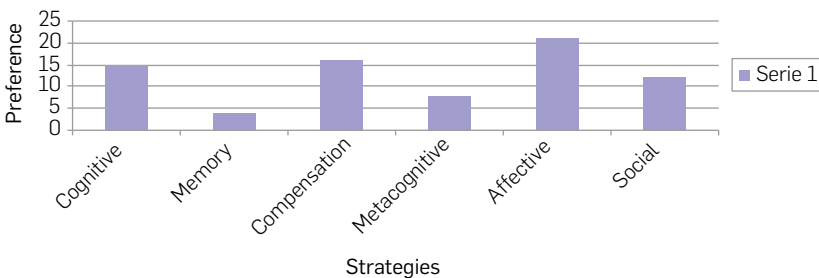
The social strategies category shows that almost all of the participants, (16 of them) occasionally ask others while more than half of the participants ask the teacher frequently to understand the text.

Question 7 from the survey refers to the four favourite strategies the participants prefer according to the survey. The data is presented in table.

Table 8 (The four favourite strategies chosen by students)

Question	1a	1b	1c	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	5c	6a	6b	6c
N° of ss.	6	6	3	4	?	?	5	2	9	4	2	2	11	4	6	8	2	2
Affective = 21, Compensation = 16, Cognitive = 15, Social = 12, Metacognitive = 8, Memory = 4																		

Figure 8 (Participant Preferences)



When the participants were asked for their favourite strategies, more than half chose the affective category as their favourite, specifically question N° 5a that refers to having an appropriate environment to read. Question 3b refers to the use of dictionary and it was chosen by 8 of the participants. Social strategies such as asking to the teacher and cognitive as taking notes and reading aloud were also marked as

preferred. The less used strategies were the memory ones, none of the students chose creating mental maps or designing concept maps as favourite.

Interview

- › Student A considers the compensation strategy useful for understanding scientific texts, specially the use of the dictionary. Memory and Cognitive strategies such as finding key words and paraphrasing are also used by the participant. The student also expresses that he didn't find any difficulties when he was reading the text provided before the interview.
- › Student B uses the cognitive strategy frequently emphasizing in reading aloud, he also considers it important and productive to ask the teacher to clarify his doubts. He mentions the use of the dictionary and searching for key words as an important tool during reading. Student B didn't find any difficulties while reading the text before the interview. Student C considers the use of dictionary and reading the text more than once relevant for her reading process. As student B she said that asking the teacher and reading out aloud are good and useful strategies. She had some vocabulary difficulties while reading the text before the interview.
- › During the interview, Student D mentioned many times that she uses the dictionary and that she finds it as an important tool to understand scientific texts. As Students B and C she uses the strategy of reading aloud and student C she reads the text as many times as necessary. Student D was the only one choosing the affective strategy telling that it's important to have an appropriate environment to read. During the reading she had difficulties with vocabulary.
- › Only Students C and D consider rereading, and both of them are girls.
- › All of the students mention that they use the dictionary while reading a text to solve difficulties.

Students A, B and C asked questions the teacher when they needed to clarify doubts.

Some examples of the participants mentioning the use of the dictionary (Appendix 5):

“¿Qué haces cuando encuentras alguna dificultad para leer un texto de ciencias?”

Student A: “Busco las fuentes necesarias para poder entender la dificultad”.

Student D: “Lo leo hasta que lo entienda y busco las palabras que no entienda”.

“¿Qué tipo de fuentes?”

Student A: “Pueden ser fuentes de Internet, libros, diccionarios, guías”.

Some examples of the rereading category (emergent from this study) expressed by students C and D (Appendix 5):

¿Cómo leíste el texto, qué metodología usaste?

Student C: “Leí varias veces porque al comienzo no lo entendía y busqué una palabra que no entendía”.

Student D: “Leer en voz alta y leerlo varias veces”.

6. Discussion

The current study is based on the reading strategies 6th graders use to understand scientific literature. Through the different analysis done it's possible to observe that the majority of the participants use the affective strategy to understand better science texts; in the interview some of the participants such as Student A and D mentioned this strategy, an example is when they said they like to read alone or in an appropriate environment.

When the participants were asked if they prefer to read using their own methodology rather than the teacher's all of them said that they prefer theirs. This answer can let us think that sometimes we as teachers are deciding over something that in most cases is a personal decision, taking into consideration that everybody has a different learning style. It does not mean that we have to let students do whatever they want, it is just that we have to give them the tools for them to choose over the wide variety of strategies so they can decide which one helps them more.

All the participants that were interviewed and many of the participants that answered the survey chose the dictionary as an instrument to solve difficulties; this is an easy way to find solutions but they must consider other alternatives such as internet, books or inferring meanings in the reading. Only participant A mentioned other sources different from a dictionary.

One of the most used strategy according to the survey and the interview was the social strategy. Many of the participants (survey and interview) think that it is useful to ask the teacher, this strategy is positive if the student is in the class but when they are reading at home or in a place where there are no teachers, they need to have an autonomous reading. It's important to emphasize and promote individual reading, teaching them or guiding them to find solutions to their needs.

Both, the survey and the interview coincide in that memory strategies are not frequently used. It's interesting to see how students are now trying to analyze, comprehend and not memorize. Even though the memory category offers different alternatives or strategies that could be useful for students but if they don't know how to make a summary, write main ideas or construct mental or concept maps, they won't do it.

All the participants from the interview think that the best strategies are the ones that they use because these are the ones that let them understand better. For a further study it would be interesting to ask them for the ones that they don't know or the ones that they haven't used so that teachers can work on those giving them more possibilities to choose.

In the interview it was observed that only students C and D, both girls, chose rereading as a strategy. Both consider that reading more than twice help them understand scientific texts. A different study could use this point to analyse a gender perspective and reading strategies, differences probably will appear.

The research paper also shows that there is no a representative difference between the strategies used by the students who are considered proficient in science according to scores and class development.

The research paper goals were reached and it was possible to identify some of the reading strategies 6th graders use, which strategies they prefer to use to understand science texts and the reason why. The suggestion is to continue searching and identifying learning strategies that help students develop and improve their reading.

7. Conclusions

Why is it important to know about student's preferences and strategies used? The idea is that teachers from different academic areas become interested in developing reading skills strategies that motivate students to read and understand, in this particular case, scientific texts.

Creating new strategies is important to know what they like to do or to apply exercises that promote their methodologies according to their learning styles. Sometimes we, as teachers, forget about the things that our students like, and most of the time those are the things that motivate their learning.

With this study doors are open to continue investigating, now that we have taken the first step that is identifying the strategies that students use to read and the ones they prefer. Further studies can be done with a bigger population to have more information. And other studies to see how students might improve reading skills through science texts using the strategies they prefer.

The invitation is for teachers, to analyse the interests of students and to take into account those aspects that help them improve their learning.

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Appendix

Appendix 1

Survey

1. Cognitive Strategies

- 1a. When you are reading a science text you take notes of the main ideas
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 1b. When you are reading a science text you read aloud to understand better
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 1c. When you are reading a science text you transfer the idea of the author into your own words (paraphrase)
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___

2. Memory Strategies

- 2a. When you are reading a science text you use key words as an important tool to understand
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 2b. When you are reading a science text you create mental maps
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___

2c. When you are reading a science text you construct concept maps to help you remember concepts or ideas

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

3. Compensation Strategies

3a. When you are reading a science text you try to guess what is going to happen next

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

3b. When you are reading a science text you use the dictionary to look for important concepts

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

3c. When you are reading a science text you relate the vocabulary with some words in Spanish

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

4. Metacognitive Strategies

4a. When you are reading a science text you analyze the way you are reading

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

4b. When you are reading a science text you organize the reading in an specific way

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

4c. When you are reading a science text you try to find errors you made while you read

a. always ___ b. frequently ___ c. occasionally ___ d. never ___

5. Affective Strategies

- 5a. When you are reading a science text you try to find the appropriate environment where you feel comfortable
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 5b. When you are reading a science text you decide to stop reading because your not in a good mood
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 5c. When you are reading a science text you need a stimuli such as an interesting topic
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___

6. Social Strategies

- 6a. When you are reading a science text you ask the teacher for explanation
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 6b. When you are reading a science text you ask your classmates for an explanation
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
- 6c. When you are reading a science text you need others to help you understand concepts
- a. always ___ b. frequently ___ c. occasionally ___ d. never ___
7. From the questionnaire above, select the 4 strategies that you prefer to use when your reading science text. Write the number and the letter of your choices.

Appendix 2

Analysis of Products

Reading: Types of Machines

<h3>Types of Machines</h3>	SECTION 2
<p>The logs for your new home have been prepared. You used an ax to chop notches close to the ends. The notches will hold the logs to each other when they are fitted together to form the sides of the cabin. The sides of the log cabin will be about 2.4 meters high. You cannot lift the heavy logs without help, so you've gathered your neighbors together for a house-raising. However, neither the force you can apply with your muscles nor that of your neighbors will be enough to accomplish your goals. What is the solution?</p> <p>One of your neighbors who has assisted at many house-raising takes charge. He and your other neighbors use long pieces of wood to roll a log into place at the bottom of the cabin. Then they use poles and rope to roll the log up to the top of the cabin. Construction takes place before your eyes! What did your neighbors know that you didn't? They knew how to use the resources around them as machines. The machines they used are simple machines, machines that have only one or two parts. There are six simple machines: the lever, the wheel and axle, the pulley, the inclined plane, the wedge, and the screw. Which of these machines might be used at a house-raising?</p>	<p>Objectives</p> <p>Name and describe the six types of simple machines.</p> <p>Evaluate the mechanical advantage of simple machines.</p> <p>Design and construct a compound machine.</p>
	<p>Section 2 Types of Machines 109</p>

Text Book: HOLT, Physical Science, Page 109.

Methodology:

- Read the text
- Use the strategies that you consider necessary to understand the text.
- Answer some questions during the personal interview.

Answers				
Question	Student A	Student B	Student C	Student D
1. ¿Cómo leíste el texto?				
2. ¿Encontraste alguna dificultad cuando leíste el texto?				
3. ¿Cómo resolviste esa dificultad?				

Appendix 3

Semi-Structured Interview

Question	Answers			
	Student A	Student B	Student C	Student D
1. Describe lo que haces cuando estás leyendo un texto de ciencias para entenderlo.				
2. ¿Entiendes más cuando lees por tu cuenta que cuando el profesor te da una metodología específica para leer? ¿Por qué?				
3. ¿Por qué crees que la estrategia o metodología que usas para leer textos de ciencias es la apropiada?				
4. ¿Qué haces cuando encuentras dificultades para leer un texto de ciencias?				
5. Si tuvieras que recomendar a alguien la forma más efectiva para entender una lectura de ciencias ¿cómo le sugerirías que leyera? Y ¿por qué?				

Appendix 4

Survey Analysis

1. Cognitive Strategies

- 1a. When you are reading a science text you take notes of the main ideas
- a. always __2__ b. frequently __11__ c. occasionally __6__
d. never __0__
- 1b. When you are reading a science text you read aloud to understand better
- a. always __5__ b. frequently __4__ c. occasionally __8__
d. never __2__
- 1c. When you are reading a science text you transfer the idea of the author into your own words (paraphrase)
- a. always __1__ b. frequently __7__ c. occasionally __7__
d. never __4__

2. Memory Strategies

- 2a. When you are reading a science text you use key words as an important tool to understand
- a. always __2__ b. frequently __5__ c. occasionally __12__
d. never _____
- 2b. When you are reading a science text you create mental maps
- a. always __ b. frequently __5__ c. occasionally __7__
d. never __7__

2c. When you are reading a science text you construct concept maps to help you remember concepts or ideas

- a. always ___10___ b. frequently ___2___ c. occasionally ___7___
d. never ___10___

3. Compensation Strategies

3a. When you are reading a science text you try to guess what is going to happen next

- a. always ___3___ b. frequently ___7___ c. occasionally ___8___
d. never ___1___

3b. When you are reading a science text you use the dictionary to look for important concepts

- a. always ___3___ b. frequently ___8___ c. occasionally ___7___
d. never ___1___

3c. When you are reading a science text you relate the vocabulary with some words in Spanish

- a. always ___3___ b. frequently ___10___ c. occasionally ___6___
d. never _____

4. Metacognitive Strategies

4a. When you are reading a science text you analyze the way you are reading

- a. always ___5___ b. frequently ___7___ c. occasionally ___6___
d. never ___1___

4b. When you are reading a science text you organize the reading in an specific way

- a. always ___1___ b. frequently ___7___ c. occasionally ___9___
d. never ___2___

4c. When you are reading a science text you try to find errors you made while you read

- a. always __2__ b. frequently __5__ c. occasionally __8__
d. never __4__

5. Affective Strategies

5a. When you are reading a science text you try to find the appropriate environment where you feel comfortable

- a. always __10__ b. frequently __7__ c. occasionally __2__
d. never _____

5b. When you are reading a science text you decide to stop reading because you're not in a good mood

- a. always __4__ b. frequently __6__ c. occasionally __7__
d. never __2__

5c. When you are reading a science text you need a stimulus such as an interesting topic

- a. always __5__ b. frequently __8__ c. occasionally __6__
d. never _____

6. Social Strategies

6a. When you are reading a science text you ask the teacher for explanation

- a. always __2__ b. frequently __10__ c. occasionally __7__
d. never _____

6b. When you are reading a science text you ask your classmates for an explanation

- a. always _____ b. frequently __7__ c. occasionally __12__
d. never _____

6c. When you are reading a science text you need others to help you understand concepts

- a. always ____ b. frequently __1__ c. occasionally __16__
d. never __2__

7. From the questionnaire above, select the 4 strategies that you prefer to use when your reading science text. Write the number and the letter of your choices.

1 ^a	1b	1c	2a	2b	2c	3a	3b	3c	4a	4b	4c	5a	5b	5c	6a	6b	6c
6	6	3	4			5	2	9	4	2	2	11	4	6	8	2	2

Appendix 5

Interview Analysis

Interviewer: María Paula Vélez (**MPV**) Participant: Student A (**SA**)

	Interview	Categories
MPV	¿Cómo leíste el texto? ¿Qué metodología usaste?	
SA	Pues la verdad prácticamente no usé una estrategia muy conocida o simplemente leí de una forma normal y fue fácil entender	
MPV	¿Encontraste alguna dificultad al leer el texto?	
SA	No, dificultades, ninguna.	
MPV	Algo que no entenderas...	
SA	Partes del vocabulario del texto.	Memory
MPV	¿Cómo resolviste esa dificultad?	
SA	Pues traté de leer lo que seguía del texto lo que seguía de las oraciones para poder entender.	
MPV	Para ti ¿qué es leer en una forma normal?	
SA	Leer en una forma normal es rápida y un forma en la que se pueda entender bien lo que se está leyendo.	
MPV	Yo te vi haciendo algo	
SA	Pues subrayando las palabras desconocidas.	Cognitive
MPV	Describe lo que haces cuando estás leyendo un texto de ciencias para entenderlo.	
SA	El texto me lo pongo en mi mente y trato de explicarlo con las ideas que yo tengo.	Memory Cognitive
MPV	¿Entiendes más cuando lees por tu cuenta que cuando el profesor te da una metodología específica para leer? ¿Por qué?	
SA	La verdad siempre entiendo yo cuando estoy leyendo solo, cuando estoy estudiando solo se me hace más fácil entender los temas.	Affective
MPV	¿Por qué crees que la estrategia o metodología que usas para leer textos de ciencias es la apropiada?	
SA	Por qué es la que se acomoda a la forma en la que a mí me gusta leer, me gusta escribir, la que a mí me gusta estudiar y entender las cosas del tema.	

	Interview	Categories
MPV	¿Qué haces cuando encuentras dificultades para leer un texto de ciencias?	
SA	Busco las fuentes necesarias para poder entender esa dificultad que tengo.	
MPV	¿Qué tipo de fuentes?	
SA	Pueden ser fuentes de Internet, libros, diccionarios, guías.	Compensation
MPV	Si tuvieras que recomendar a alguien la forma más efectiva para entender una lectura de ciencias ¿cómo le sugerirías que leyera? Y ¿por qué?	
SA	Que leyera de una forma sola, con calma y tratara de entender bien el tema que está tratando.	Compensation
MPV	Cuando dices con calma te refieres a qué	
SA	Con calma, a leerlo varias veces, entender lo que se está leyendo porque un tema que no queda bien prácticamente es un tema que no sirve.	Compensation
MPV	Nada de hacer resúmenes	
SA	Jamás hago un resumen, jamás hago un mapa conceptual a menos que el profesor lo ordene porque cada persona tiene su forma de entender	

Memory = 2, Cognitive = 2, Affective = 1, Compensation = 3

Interviewer: María Paula Vélez (MPV) Participant: Student B (SB)

	Interview	Categories
MPV	¿Cómo leíste el texto? ¿Qué metodología usaste?	
SB	Leí en voz alta varias veces.	Cognitive
MPV	¿Encontraste alguna dificultad al leer el texto?	
SB	No, ninguna.	
MPV	Describe lo que haces cuando estás leyendo un texto de ciencias para entenderlo.	
SB	Bueno el principal método que yo uso para entender un texto de ciencias es leerlo en voz alta también sacar el vocabulario y buscarlo en el diccionario las palabras que no entienda en el texto.	Cognitive Memory Compensation
MPV	¿Entiendes más cuando lees por tu cuenta que cuando el profesor te da una metodología específica para leer? ¿Por qué?	
SB	De las dos formas es muy fácil entender pero la que más me parece cómoda es cuando se lee en grupos o en parejas porque uno puede escuchar el texto no viéndolo ni leyéndolo uno sino escuchando y pensando con otros.	Social
MPV	¿Por qué crees que la estrategia o metodología que usas para leer textos de ciencias es la apropiada?	
SB	Correcta de cierta manera porque cada quien tiene su metodología y cada quien la escoge porque sabe usarla y la entiende así, por ejemplo a mí me parece que la mía está correcta porque por lo menos yo entiendo más cuando escucho lo que estoy leyendo porque cuando leo el texto y no escucho me pierdo en los textos y no los leo bien.	Cognitive
MPV	¿Qué haces cuando encuentras dificultades para leer un texto de ciencias?	
SB	Cuando lo estoy leyendo si estoy en grupo y encuentro alguna dificultad le pregunto al compañero del grupo que esté conmigo o al grupo con el que estoy trabajando y si estoy solo le pregunto a la profesora o a un compañero cercano.	Social
MPV	Si tuvieras que recomendar a alguien la forma más efectiva para entender una lectura de ciencias ¿cómo le sugerirías que leyera? Y ¿por qué?	
SB	Le sugiero la que yo uso, o sea cada quien tiene su forma de aprender y cada quien tiene sus diferentes análisis pero yo les recomendaría la de leer en voz alta y cuando no entienda preguntarle a la profesora o algún compañero porque uno queda sin dudas en el texto y lo puede entender.	Cognitive Social

Memory = 1, Cognitive = 4, Social = 3, Compensation = 1

Interviewer: María Paula Vélez (**MPV**) Participant: Student C (**SC**)

	Interview	Categories
MPV	¿Cómo leíste el texto? ¿Qué metodología usaste?	
SC	Leí varias veces porque al comienzo no lo entendía y busqué una palabra que tampoco entendía.	Rereading Compensation
MPV	¿Encontraste alguna dificultad al leer el texto?	
SC	La palabra que no entendí.	
MPV	¿Cómo resolviste esa dificultad?	
SC	Buscando en el diccionario	Compensation
MPV	Describe lo que haces cuando estás leyendo un texto de ciencias para entenderlo.	
SC	Leo en voz alta y lo leo cuantas veces lo necesite para poder entenderlo mejor.	Cognitive Rereading
MPV	¿Entiendes más cuando lees por tu cuenta que cuando el profesor te da una metodología específica para leer? ¿Por qué?	
SC	Con mi propia estrategia porque yo la manejo.	
MPV	¿Por qué crees que la estrategia o metodología que usas para leer textos de ciencias es la apropiada?	
SB	Porque es fácil y entendible	
MPV	¿Qué haces cuando encuentras dificultades para leer un texto de ciencias?	
SC	Trato de leerlo otra vez y si no lo entiendo voy donde la profesora y pregunto.	Rereading Social
MPV	Si tuvieras que recomendar a alguien la forma más efectiva para entender una lectura de ciencias ¿cómo le sugerirías que leyera? Y ¿por qué?	
SC	Leer en voz alta y cuando no entienda una palabra buscarla en el diccionario. Porque puede leer la palabra varias veces pero si no la entiende tiene que buscarla en un diccionario.	Cognitive Compensation

Cognitive = 2 , Social = 1 , Compensation = 3 , Rereading = 3

Interviewer: María Paula Vélez (MPV) Participant: Student D (SD)

	Interview	Categories
MPV	¿Cómo leíste el texto? ¿Qué metodología usaste?	
SD	Leer en voz alta y leerlo otra vez	Cognitive Rereading
MPV	¿Encontraste alguna dificultad al leer el texto?	
SD	La palabra que no entendí.	
MPV	¿Cómo resolviste esa dificultad?	
SD	Buscando en el diccionario	Compensation
MPV	Describe lo que haces cuando estás leyendo un texto de ciencias para entenderlo.	
SD	Leo en voz alta y me gusta estar en un lugar donde no haya tanta bulla para concentrarme más y buscar las palabras en el diccionario.	Cognitive Affective Compensation
MPV	¿Entiendes más cuando lees por tu cuenta que cuando el profesor te da una metodología específica para leer? ¿Por qué?	
SD	Cuando leo por mi cuenta, porque me concentro más.	
MPV	¿Por qué crees que la estrategia o metodología que usas para leer textos de ciencias es la apropiada?	
SD	Porque yo entiendo más y a veces aprendo más.	
MPV	¿Qué haces cuando encuentras dificultades para leer un texto de ciencias?	
SD	Lo leo hasta que lo entienda y busco las palabras que no entiendo.	Rereading Compensation
MPV	¿En dónde las buscas?	
SD	En el diccionario.	Compensation
MPV	Si tuvieras que recomendar a alguien la forma más efectiva para entender una lectura de ciencias ¿cómo le sugerirías que leyera? Y ¿por qué?	
SD	Que estuviera en un lugar callado para que se concentrara más y que leyera en voz alta y que buscara en el diccionario las palabras que no entendiera.	Affective Cognitive Compensation

Cognitive = 3, Affective = 2, Compensation = 5, Rereading = 2