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READING STRATEGIES IN ENGLISH: FOCUS ON PHYSICS-RELATED ACADEMIC TEXTS

Estratégias de Leitura em Inglês: Foco em Textos Acadêmicos da Área de Física

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ABSTRACT: *The present study aims to verify whether the awareness of the use of reading strategies would contribute to the comprehension of academic texts in English of four undergraduate students. This is a qualitative and quantitative research. A questionnaire, a cloze test, and verbal reports were used for data collection. Students reported having more facility on reading the texts after being conscious of the reading strategies. There was a significant improvement on the reading comprehension of the students that participated in the study and these data will surely contribute to future research on reading in English for academic purposes.*

KEYWORDS: Reading comprehension; Reading strategies; Academic English; English in Physics; Cloze test

RESUMO: *O presente estudo tem como principal objetivo verificar se a consciência do uso das estratégias de leitura contribuiria para a compreensão de textos acadêmicos em inglês de quatro alunos de graduação. Trata-se de uma pesquisa qualitativa e interpretativa. Um questionário, um teste cloze e protocolos verbais de leitura foram utilizados para coletar os dados. Os alunos afirmaram perceber maior facilidade na leitura de textos após estarem conscientes das estratégias de leitura. Houve um aumento significativo na compreensão dos textos dos alunos que participaram do estudo e os dados coletados contribuirão para futuras pesquisas na área da leitura de textos em inglês para fins acadêmicos.*

PALAVRAS-CHAVE: Compreensão de texto; Estratégias de leitura; Inglês acadêmico; Inglês na Física; Teste Cloze

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1. Introduction

Effectively introduced in the reading area, especially among psychoanalysts as Goodman (1967) and Smith (1989), the term strategy "is being used to characterize several hypothetical behaviors of the reader during the reading process" (KATO, 2007, p. 64). The term strategy is also used by some Linguistics and Psycholinguistics theorists and it is related to the necessity of facing and solving problems when processing sentences (SILVEIRA, 2005).

For Silveira (2005), the notion of reading strategies is justified originally on psycholinguistic models of reading which considers reading as an active and interactive process, whose comprehension is given by the activation of mental schemes and pragmatic discursive abilities of the reader. Kleiman (2002, p. 49) defines reading strategies as "regular operations to approach the text". To her, teaching linguistic abilities must associate not only the study of reading strategies but also the study of linguistic abilities. In fact, if the student is able to decode the written text and benefit from the syntactical information presented in the text and still show comprehension difficulties, this means that he is making inappropriate use of the reading strategies.

Reading strategies have been classified into cognitive and metacognitive strategies (KATO, 2007; KLEIMAN, 2002). The strategies recognized as unconscious, automatic, effective, economic, and used in fluent reading are the cognitive strategies. These strategies embrace "the knowledge of the syntactical, lexical, and semantic components that interact with the visual information" (SILVEIRA, 2005, p. 76).

The metacognitive reading strategies are consciously performed operations when the reader has an objective in mind for determined text or when an uncertainty, mistake or failure is detected, forcing him to make the process less automatic. Therefore, the reader starts to have an active and conscious control of his reading process in order to solve his comprehension problem (KATO, 2007).

Considering the importance of the reading strategies in the literature, this paper brings the result of a research that aimed to verify whether the consciousness of the use of reading strategies contributes to the comprehension of academic texts in English of seven undergraduation students. The research was part of a project designed to assist physics and mechanical engineering undergraduate students to read in English for the

participation to the jury of the IYPT Brazil 2016 – International Young Physics Tournament[1].

2. Theoretical background

2.1. Previous knowledge in reading

The elements incorporated in the reading process are not different from the ones that determine our world comprehension in general. One of these elements is the previous knowledge, usually defined as a set of learnings, that the person brings as a contribution to her own reading. Thereby, the person can interact with the text in a way that she can merge the information built by the writer with her own world knowledge. Fávero (2009) brings out that the previous knowledge is responsible for the coherence the reader assigns to the text, being considered a base element, underlying to all others.

Many authors, among them Kleiman (1989) and Leffa (1996), discuss the role of previous knowledge on the reading process. For Leffa (1996), reading implies an agreement between the reader's previous knowledge and the data given by the text. From this point of view, "reader and text behave like two gears running inside each other; whenever there is no fitting in the gears, reader and text separate and keep running unstuck" (LEFFA, 1996, p. 22).

Previous knowledge is described by Kleiman (1989) as the learnings acquired by the reader over his life, among them are the linguistic, textual, and the world knowledge. For the author, the interaction of these levels of knowledge enables the construction of the text meaning by the reader.

The linguistic knowledge plays a fundamental role on text processing and "includes the knowledge of a language pronunciation, going through vocabulary

[1]The IYPT is a scientific event based on the debate of experimental and theoretical opened physics-related problem solutions. The students that took part on the jury had to be able to use adequate reading strategies when facing difficulties on reading scientific texts for the event. Once it is about an international event and the scientific articles used to substantiate the problems are all written in English, it became essential to prepare these students to read texts in English.

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knowledge and language rules, reaching the knowledge about the language use" (KLEIMAN, 1989, p.13).

The textual knowledge comprehends all the set of notions and concepts about the text that are fundamental to the textual understanding. "The more textual knowledge the reader has and the more exposure to all kinds of texts he is used to, the easier it is his comprehension because the knowledge of textual structures and types of discourse will determine the reader's expectation about the text" (KLEIMAN, 1989, p.20). The knowledge the reader already has about the textual structure and the kind of text is also a key factor to the comprehension of the theme.

The world knowledge, that includes the encyclopedic knowledge, embraces the learnings acquired informally as much as those acquired formally, through experiences and society interaction. This learning involves experiences, beliefs and society values (KLEIMAN, 1989). It is a sort of cultural knowledge filed and organized in blocks inside the long-term memory, also called global cognitive models.

2.2. The bottom-up and top-down reading processes

Reading models assume both a bottom-up and/or a top-down orientation. The bottom-up processing defended by Gough (1972, apud SILVEIRA, 2005), favors text expressions and words and is based on a reading process more focused on the text itself. In the top-down model, supported by Goodman (1967) centered on the theoretical psycholinguistic contribution. The reader process the reading by hypothesizing, considering his previous knowledge.

According to Rumelhart (1977, apud SILVEIRA), the experienced reader, the two subprocesses, bottom-up and top-down, occur alternative and interactively. Therefore, the processes focused in the text (bottom-up) and those focused on the reader (top-down) must interact every time we read: sometimes one prevails, at other times the other, but both are necessary. That happens because reading is an interacting process between the reader and the text, and the complexity of this process "does not allow the fixation on only one of its poles, excluding the other" (LEFFA, 1996, p. 17).

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The bottom-up process (also known as "text-based" or "data driven processing") aims the text and prioritize the graphic processing, "recognizing letters and words, studying the phrasal structures" (NUTTAL, 1996, p. 17). Due to this process, the reader, when using this process, becomes slow and his participation limited because he tends to assign meanings just with the data presented in the text. Hence, the reading is not fluent because in this bottom-up process the reader makes no use of the context and his world knowledge, showing difficulties to synthesize the main ideas (KATO, 2007).

In contrast to the presented model, on the top-down process (also known as "knowledge based", "conceptually drive" or "information processing"), the text is no longer the focus and non-visual information becomes priority. The reader does not give his entire attention to all the information contained in the text, in consequence, he "gives up on his intelligence and experience" (NUTTAL, 1996, p. 16), making use of inferences. He is fluent, fast, makes use of predictions and supposedly learn faster the general ideas of the text (KATO 2007).

Goodman (1967) and Smith (1989) are theorists that support the top-down reading model. For Goodman (1967), reading is seen as a "psycholinguistic game of predictions" that, in a selective process, involves the partial use of minimal linguistic hints that are available. By the time this partial information is processed, temporary decisions are made to be confirmed, rejected or refined on the reading process. Reading involves the interaction between language and thought. For this author, efficient reading is not a result of precise perceptions and the identification of every textual element, but the selection of smaller and more productive hints.

Although the notion of a model is necessary for the study of reading as a cognitive process, it is important to note that no reading model can cope with the reading complexity and its processing. In the models shown, for example, we must admit some advantages and also some fragility. The models that prioritize the top-down process may favor a faster, not so careful and possibly falsifying reading, although the process is faster; now the models that support the bottom-up process favors a more careful and detailed reading, although It takes more time of the reader. Therefore, the interactive process seems more balanced; in other words, the proficient reader uses both types of processes, depending on the difficulties and easiness that he faces when running into a text.

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2.3. The cloze test and reading verbal reports

The cloze test is used to evaluate the reading comprehension on several educational levels and its acceptance has been demonstrated by many national (CASTRO, 2008; KLEIMAN, 1983; SANTOS et. al. 2002; SANTOS, 2004, SANTOS, 2005, SANTOS et. al, 2009. SILVA and WITTER, 2008) and international publications (ANGLAT, 2008; BRIÈRE, et. al, 1978; BROWN, 1980; 2002; MACLEAN, 1984; MACKAMEY, 2006), and can be used for reading evaluation in the mother and also for foreign languages (MACLEAN, 1984; OLLER, 1972; CARREL and CARSON, 1993). The required reading comprehension for the cloze test involves, among other variables, the reader's ability of establishing relations between text elements and his capacity to develop appropriate associations between previous knowledge and textual information (inferential and lexical comprehension).

Verbal reports can be used when the researcher is interested in determining aspects of the reader's behavior and the strategies he uses during a reading activity that can be done with: (a) pauses during the read, (b) the use of meaningless words, and (c) applying the cloze test. In this approach, reading out loud is no longer only about recitation but the externalization of a process, once the readers tell about their reading process and also about other main issues.

3. Materials and methods

Cognitive and metacognitive hypothesis of reading comprehension processing from many authors were used as theoretical and methodological basis for this research, i.e. Goodman (1967), Kato (1983, 1984, 2007), Kleiman (1983, 1989, 2002, 2994), Leffa (1996), Nuttal (1982), Silveira (2005) and others.

The research was conducted at the Federal Institute of Education, Science and Technology of São Paulo – Piracicaba Campus. The volunteers were four students selected to participate as juries on the International Young Physics Tournament - IYPT Brazil 2016.

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The study was divided into three phases. First, students responded to a questionnaire about how English was incorporated in their academic lives. Questions included the frequency students read scientific texts in English and how they use to face problems of reading comprehension while reading these texts.

Next, the English reading comprehension level of the subjects was assessed. They were evaluated by means of a cloze test (Figure 1). The selected text was one of the scientific articles in the area of physics, mentioned on the Reference Kit IYPT 2016. Every 10th word was removed from the text, totalizing 20 gaps. Students had to write a word that could best complete the meaning of the sentence.

The third phase was composed of the teaching and comprehension of the main reading strategies and its techniques used to read academic texts, in this case those in the area of physics. Meetings with the researcher professor, together with the volunteers were conducted, where text analysis and activities such as cloze tests were performed. Furthermore, verbal reports were collected during every focal group then translated to be analyzed, in order to get the results about students' reading comprehension progress.

4. Analysis and discussion of the results

In this section we will present the results collected from the questionnaire, cloze test, and the verbal reports. According to the questionnaire applied (APPENDIX 1), 50% of the students self-evaluate their familiarity with English language in general as good and the other half evaluate as regular. The figure below shows how the students classify their English scientific text reading ability.

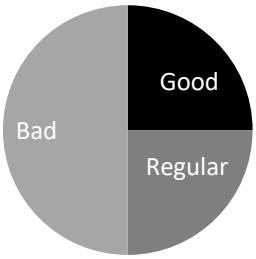

Figure 1. Answers given for the question "How do you evaluate your English scientific text reading ability?"

Conversely, one question was about how important reading in English was during university and all of them described it as "very important". On top of that, only one of the students recognized reading scientific texts in English frequently, corroboration with the data about scientific text reading ability previously presented. In addition, most of the students affirmed having difficulty with technical vocabulary.

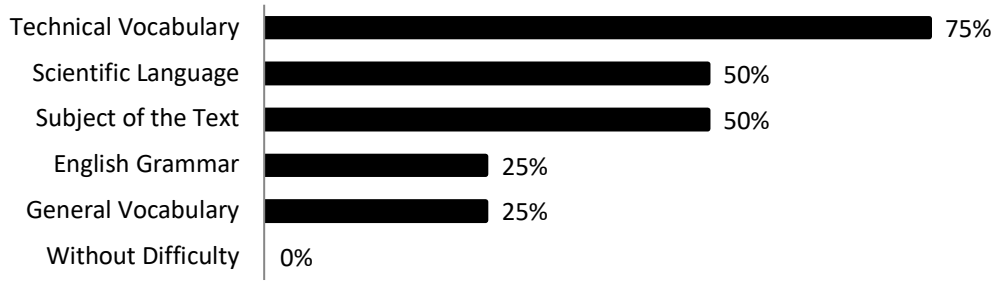

Figure 2. Main difficulties reported by the students while reading in English.

After the questionnaire, a first application of the cloze test was made in order to verify the students' reading level and their understanding about the text. The students were also questioned about the difficulty of the test in a scale from 0 to 10, where 0 is considered very easy and 10 very difficult. The test used is presented in Figure 3.

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THE DYNAMICS OF A BOUNCING SUPERBALL WITH SPIN

In this article, we consider another very simple toy, namely a superball. The interesting aspects of a superball are that (i) it is _____(1)_____ elastic with a coefficient of restitution close to 1, and so _____(2)_____ very high and (ii) at a bounce, it grips the surface _____(3)_____ well which can result in a significant change in spin _____(4)_____ the ball. These two aspects result in some interesting _____(5)_____ for a bouncing superball. It is assumed that during _____(6)_____ impulsive interaction of the ball with the surface on _____(7)_____ it is bouncing, the impulsive friction and normal reaction _____(8)_____ the laws of friction and Routh [7] cites experimental evidence to _____(9)_____ effect. However, whilst this approach can describe a single _____(10)_____ of direction of motion of the ball, it is _____(11)_____ to predict the rich spectrum of back and forward _____(12)_____ which the superball can exhibit. The modelling of the _____(13)_____ of a ball in the vertical direction consists of _____(14)_____ components, namely (i) a reversal of the vertical velocity and (ii) a _____(15)_____ in the vertical velocity after the bounce by a (constant) coefficient of restitution. _____(16)_____ model the bounce of a superball, the first of _____(17)_____ two concepts was extended by Garwin [8] who considered a _____(18)_____ model in the horizontal direction wherein the horizontal _____(19)_____ of the ball at the point of impact is reversed at the _____(20)_____. Cross [9] modified Garwin's model by introducing the second component of a horizontal coefficient of restitution that reduces the horizontal velocity of the ball after the bounce by a fixed amount. In both cases, this equation describing the change in the horizontal velocity at the bounce was combined with an equation representing the conservation of angular momentum. These two equations were solved to give the horizontal and angular velocities after the bounce in terms of these quantities before the bounce.

Figure 3. Cloze test used in the first and third phases of the study.

To better illustrate the performance of the students in the first application of the cloze test, the Table 1 shows the students' correct answers followed by the percentage of it and the time taken by each student to complete the test.

Table 01. Correlation between the correct answers, the time the students took to complete the test and the difficulty presented

	Correct answers	Correct answers (%)	Time (minutes)	Difficulty presented
Student 01	11	55%	20	8
Student 02	7	35%	30	9,5
Student 03	5	25%	30	9
Student 04	1	05%	30	10
Average	6	30%	27,5	9,125

The figure bellow shows the percentage of the correct answers both without considering the synonyms and considering them.

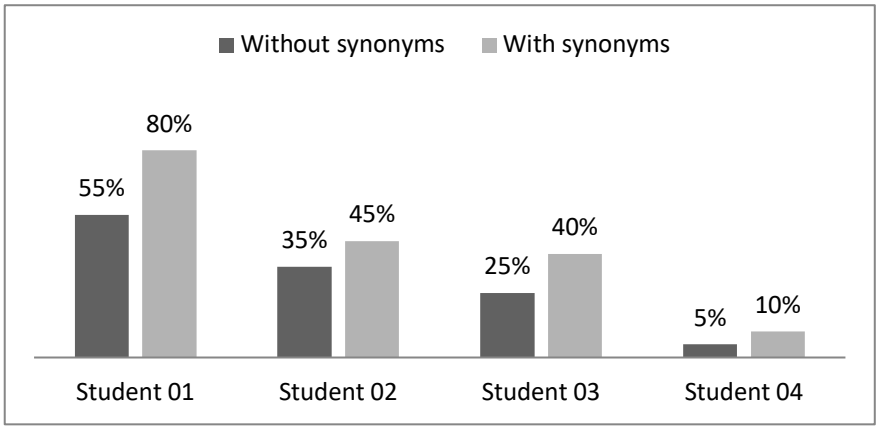

Figure 4. Percentage of right answers considering and not considering synonyms.

As seen in Table 1, the students' difficulties were elevated and the time they needed to complete the test was also above the expected. Conversely, as seen in Figure 4, the percentage of correct answers increased when considering synonyms, that is, the students had the appropriate logic, however, their vocabulary was limited, leading to the use of more common words. Some examples are shown below:

> *(1) "It is hard to do this because it looks like your vocabulary fades away and you get stuck to some things you have already seen in the text. Then it looks like some words you read come back for you to complete your vocabulary" (student 02)*
>
> *(2) "This exercises are very difficult because you don't have any clear tips to complete the gap, you have to see all the context the word is set and still pay attention to the whole text" (student 01)*

By demonstrating a higher comprehension and control of the strategies, the most proficient students frequently used metacognitive strategies, showing a wider look upon the text. Examples of metacognitive strategies are reviewing the answers chosen and taking corrective actions when perceiving mistakes.

A good strategy used by these students was reading and skimming through the whole paragraph, or in some cases the whole text, before starting the test. This strategy can, for example, help the students by providing the information needed to complete the gaps that were located in the end of the text. Some examples of this strategy are listed below.

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> *(3) "Actually I read the whole text without completing any blank space and here in the end he points out that (...)" (student 01)*
>
> *(4) "I thought in what was written ahead" (student 02)*
>
> *(5) "Consists of 'two' components. I chose 'two' because right after this he describes two components, namely a reversal of the velocity and a gain in the vertical velocity" (student 02)*
>
> *(6) "In the horizontal direction wherein the horizontal 'velocity' of the ball at the point of impact is reversed ate the 'bounce'. This 'velocity' and this 'bounce' I put due to the continuation of the text" (student 02)*
>
> *(7) "Because I finished reading and I saw that to not occur the phenomenon you must have rounded shapes (...)" (student 01)*

Although very helpful, metacognitive strategies are useless if applied alone and it is unlike that the student will find the correct answers. One example of an improper use of it is shown below, where the student based his answer only on information obtained in the text.

> *(8) "I put dynamics, because of the title and then he says 'for a bouncing superball'"(Student 04)*

The most proficient students, when translating part of the text used the same logic as presented above. They read the complete sentence before starting to translate and re-read the text to verify if the translation was accurate; on the other hand, less proficient students started translating each word from the beginning without even paying attention to nominal groups and other grammatical classifications.

> *(9) "Since the new region of conduction [the correct would be 'the new conductive region'] is less sharp, the ionization (...)" (student 03)*
>
> *(10) "Because first he talks about the direction and then about the velocity, like he did before (...)" (student 01)*

Like the metacognitive strategies, the top-down reading processes showed to be an essential tool during reading. The use of the context and the world knowledge to justify the answers given was undoubtedly the most used strategy. Although this strategy fits without bigger problems in some cases, in most situations it must be combined with other strategies. The following excerpt shows the use of the top-down process without combining it with another strategy, which led to an incorrect answer.

> *(11) "I put possible. I thought the experiment itself had this goal, not that it was necessarily possible, but the experiment looked to describe that" (student 04)*

On the other hand, examples of top-down processing being used together with other strategies were common during the activities, as shown below.

> *(12) "I was thinking in the physics itself, because I translated the whole text in my mind and I was fitting it in the theory…" (Student 01)*
>
> *(13) "I thought in what was written ahead, in the vertical direction and its components, then I thought about the movement itself" (student 02)*
>
> *(14) "I put 'perfectly elastic' because a coefficient I think it is perfect is with restitution close to one… the physics knowledge, that there is the inelastic, elastic and perfectly elastic" (student 03)*
>
> *(15) "I put possible. I thought the experiment itself had this goal, not that it was necessarily possible, but the experiment looked to describe that" (student 04)*
>
> *(16) "Didn't the teacher mention about the use of a needle to obtain the phenomenon?"(student 03)*

In some cases it is clear that the students read the whole text before completing the gaps using their world knowledge, as demonstrated in excerpts numbers 12 and 13. Conversely, we can also see the analysis of the microstructure by the use of the syntactic awareness, combined with the application of the student's knowledge, as in the excerpt14. In addition, the top-down process, more precisely the use of the world knowledge, can also be used alone, as used in excerpts 15, 16 and 17.

Regarding the bottom-up process, the analysis of the microstructure that form the text, also called as "lexical inference", was the main method used, characterized by the study of the grammatical classification of nearby words and the use of the reader's world knowledge to guess the unknown word. However, in the activities performed, this strategy was not always allied to the world knowledge, which ensures a low flexibility during the students' analysis. Some examples of this type of study made are listed.

> *(17) "This forms a free stable jet that accelerates, stretches and 'is thrown by the influence of gravity… looks like 'arrow'" (Student 04)*
>
> *(18) "I put 'most' because he says 'duration'" (student 04)*

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> *(19) "'It is assumed that during the impulsive interaction of the ball with the surface on 'where' it is bouncing(...)'. I put 'Where' because the phrase was referring to a place" (student 02)*
>
> *(20) "I chose 'movement' because we see this 'of a ball' and 'the modeling' after"(student 02)*
>
> *(21) "Because he talks about a characteristic of the ball ((referring to an adjective))" (student 01)*
>
> *(22) "These two aspects result in some interesting 'movement' for a bouncing superball. I put 'movement' because bouncing means the jump of the ball, that is a movement" (student 02)*
>
> *(23) "I thought in 'movement', 'direction', because of the spin, the 'shape' of the movement" (Student 04)*
>
> *(24) "I think it is surface, but here we have surfaces, so I didn't put it" (student 03)*

All these examples shown above refer to situations that the explanation was only the use of words around the gap, without the student using his world knowledge. Examples such as 21 and 22 show the complete use of the lexical inference, demonstrating a higher proficiency.

> *(25) "The interesting aspect of a superball is that it is 'high' elastic. I put high because it is a characteristic that was related to the elastic and because the restitution coefficient is close to one, so it is high, then I put high" (student 02)*
>
> *(26) "I don't know the exact word, but it is that thing that hits the water to create the waves. Look 'the flux is strong enough to move objects that are floating far away from the…'.It is a noun" (Student 01)*
>
> *(27) "Here before he says that a kind of propagation can 'push'... is it a false cognate? So towards would be the opposite? Bring? Because he says that waves with low amplitude can 'push', can bring the particles in the direction. Here we show that waves bring the particles to the wave source. Would it be 'to bring it closer'?" (Student 04)*

The readers frequently assigned multiple results to a single gap, which can lead to a big uncertainty if the student did not use the appropriate strategies. This situation is explained by the lack of the syntactic awareness, taking the reader to comprehend the sentences by its words organization. The next excerpt illustrates this situation.

> *(28) "The text language, the words, I did not find it hard. The words were easy and were easily understandable, even with the gaps we know the meaning of the text. The problem is that there are many similar things, so what could fit here with one expression could fit with another and still make sense" (student 02)*

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Not only is the syntactic awareness is important to text comprehension, but the pragmatic awareness also plays a crucial role in it. It is responsible for the relation between the author and the reader, that is, the communicative purpose of the text. Examples were withdrawn from the verbal reports.

> *(29) "'Fetch' I translated as 'throw'... The phrase 'from a distance' after gave the idea" (student 04)*
>
> *(30) "He says 'find a broad range of applications', 'find applications'. Broad is far, external. I made a connection with abroad... like external applications, different" (Student 04)*
>
> *(31) "I put 'to' because it was starting a phrase and then was 'model the bounce' and there was a need for something to be like 'in order to model the movement' (which is the bounce)" (student 02)*
>
> *(32) "It is hard to do this because it looks like your vocabulary fades away and you get stuck to some things you have already seen in the text. Then it looks like some words you read come back for you to complete your vocabulary" (student 02).*

About the second application of the cloze test, the main goal was to compare and analyze if the students did better than in the first application, considering their answers, the time they took to complete the test and especially the strategies used. The following table expresses some of the main points studied to see if there was any improvement.

Table 02. Correlation between the correct answers, the time the students took to complete the test and the difficulty presented in the second application of the test

	Correct answers	Correct answers (%)	Time (minutes)	Difficulty presented
Student 01	18	90%	15	4
Student 02	09	45%	20	6
Student 03	08	40%	20	7
Student 04	04	20%	25	9
Average	9,75	48,75%	20	6,5

Regarding the answers of the students, as seen in the first application of the test, there were a considerable number of answers that were not the exact words expected, however, the logical thinking used to complete the gaps was correct. Therefore, the correct answers using synonyms were also important to the analysis as a whole.

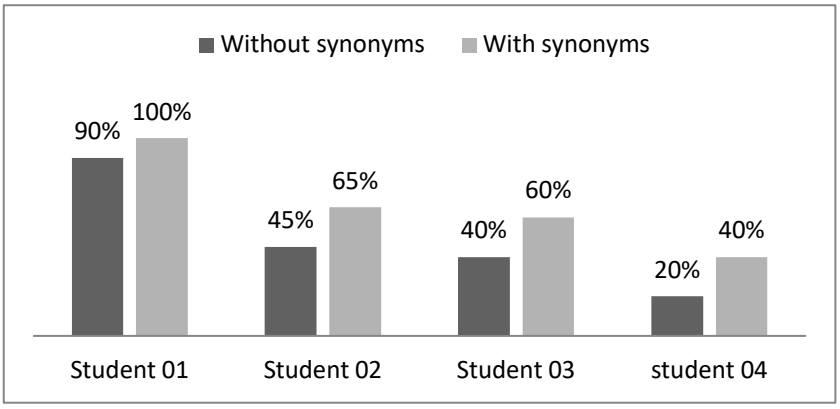

Figure 5. Percentage of right answers considering and not considering synonyms.

In comparison with the first application of the cloze test, it is clearly perceived the improvement on the students' performance, not only comparing the correct answers, but also the time taken to complete it. To better illustrate this situation, the following charts are presented:

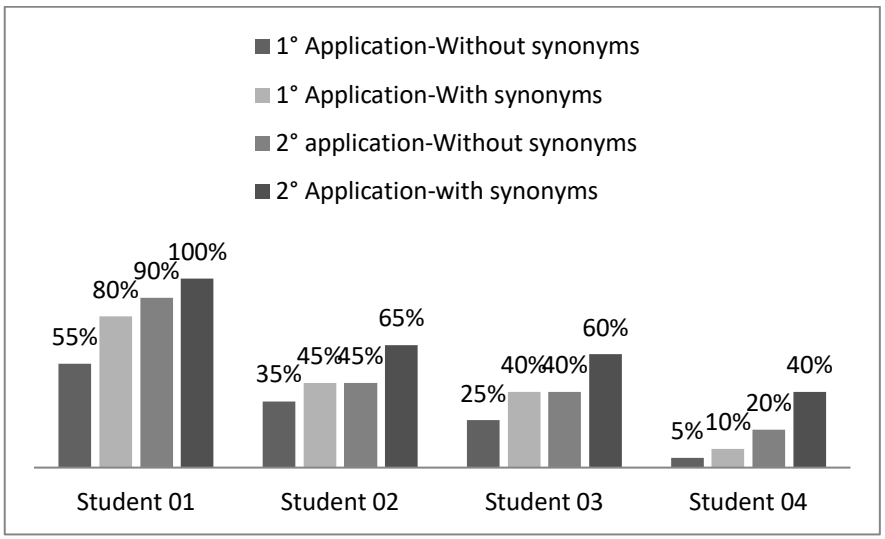

Figure 6. Percentage of right answers considering and not considering synonyms from the first and second application of the cloze test.

As seen in figure 6, the results from the first application and from the second application were contrasting. This situation is easily explained by the fact that all of the students that did the test used the strategies studied during the whole experiment. The major grade improvement seen in the chart, considering the exact answers, is student's 01 grades, where the raise was of approximately 35%. Considering the answers with synonyms, student 04 had an increment in his grade of 30%. Table 03 shows the relation

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between the average correct answers, time and difficulty of the first and second applications.

Table 03. Average values of the first and second applications.

	Correct answers	Correct answers (%)	Time (minutes)	Difficulty presented
First Application	6	30%	27,5	9,125
Second Application	9,75	48,75%	20	6,5
Improvement	62,5%	18,75%	27,28%	28,78%

In face of the data given in the table above, it is clear that the general improvement was given in all forms, not only in the amount of correct answers, although this point had the higher improvement.

5. Final considerations

As an initial analysis, we can conclude that in some situations in this research, even without knowing, the most proficient students used metacognitive strategies very accurately. In contrast, the considered less proficient students have not demonstrated this ability. Other important data provided by the verbal reports confirm that the most proficient students who participated in the project frequently used the ascendant processing, or bottom-up processing, that is, grammatical and lexical hints, combined with the descendant processing, or top-down processing, for example, their world knowledge.

Despite the magnitude of reading strategies for text comprehension, we should not put aside the weight of the syntactic, pragmatic, and metatextual awareness, that when properly applied, benefit the whole reading experience. Reading is profoundly related to the situation where the text was written, in other words, evidences such as to whom the text was meant to, who wrote it and the intention of the message itself compound a set of crucial information. These elements guide an initial comprehension of the content. Therefore, as the comprehension is superficial, they must be followed by other logical reasoning and reading strategies. Taking this into consideration, to combine and fully take

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advantage of the previously explained strategy, the students should be more familiarized with English reading.

Considering the study and awareness of the reading strategies, the subjects started to have a more active role on building meaning to the text or to an unknown word. Accordingly, we can conclude that by having a wider look upon what is possible to do, that is, which ways the reader can take to build up meanings to words and sentences, he becomes secure to go forward and backward on the text to complete its meanings, to combine strategies and thoughts, contributing to his knowledge of the text.

Taking this into consideration, the results of the study indicate that having an awareness of reading strategies helps greatly to a complete comprehension of the text. Notwithstanding the small number of subjects in this study and given the individual nature of each subject involved, it is not possible to generalize the results. We can ensure, however, that these data can contribute to future research on academic reading in English.

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