



## Using Simple Vocabulary Strategies to Improve the Reading Comprehension of Scientific Articles

Angela Gamba Buitrago<sup>1</sup>

### Abstract

*The present article reports the results of a pedagogical experience in which the practice of vocabulary strategies helped a group of physiotherapy students at a higher education institution in Colombia improve their reading comprehension skills of scientific articles, regardless of their English level. Reading academic articles in English is an everyday issue for students in Colombia, and it is expected that they interpret and understand articles thoroughly and effectively in order to produce a relevant analysis of the information presented. However, not all the students have a level of English that allows them to complete the task successfully. Hence, it was necessary to design a series of “pre-teaching vocabulary worksheets” that served as a baseline to establish a glossary of technical vocabulary that would support students in further reading of scientific articles. These worksheets provided students with different vocabulary activities that helped them identify, recognize and understand new words proper of their field of study. Learning the words in an isolated way became meaningful when students found them in context in the articles they read for their classes. They were able not only to increase the speed when reading scientific articles but also to comprehend them more easily, which was evident through their discussions in class, participations in forums, reviews or articles, and good grades obtained in exams. Additionally, students gained more confidence in themselves, which benefited their academic and professional performance. Undoubtedly, these worksheets demand that teachers devote a considerable amount of time to their design; however, the effort is worthwhile once the positive results are seen.*

*Keywords: Worksheets, vocabulary, reading comprehension, scientific articles, physiotherapists.*

### Introduction

Being in contact with scientific articles in English is an everyday issue for students in Colombia nowadays. Regardless their level of comprehension in English, they must interpret and understand the content thoroughly and effectively in order to come up with relevant analysis of information and clear conclusions that lead them to the acquisition of new knowledge about specific topics. Sometimes and depending on the field of study, students might become frustrated when finding English as an obstacle to follow their learning process as a plus to the difficulty of the content itself. An American psychologist expert in human behavior, Vince Berger (2005) claims that “frustration is experienced whenever the results (goals) you are expecting do not seem to fit the effort and action you are applying.” Likewise, reading is a highly self-motivational activity and the inability to read well may lead to a loss of motivation and increased levels of frustration, which in turn, may also result in students reading less (Ahmad, 2011; Mokhtar et al., 2010; Rochecouste, Oliver, & Mulligan, 2012) [1][9]. Now, it is not a secret to say that Colombian people are not precisely known for their interest in reading, especially for academic purposes and additionally if it is in English. Despite of studying English for a long time, many ESL students continue to have a limited range of vocabulary which has an impact on both their reading comprehension and their education in general (Oliver, R., Young, S., 2016)[8]. There is an additional flow-on effect of poor reading skills for university-bound students, namely a reduced quality in their writing skills, which are also essential for university success (Mokhtar et al., 2010)[7].

Shelby (2017) states that learners can master the most important English vocabulary by reading thematic texts [11], supporting the idea that the more students read scientific articles in English, the more technical vocabulary they acquire. Nevertheless, reading in English implies lots of effort and time to understand content. Thus, students usually come up with different strategies like using online translators or even by searching the articles in Spanish that might be valid as a learning strategy, but not practical considering that most of the literature related to their field of study comes in English. This is the case of Physiotherapy students in Colombia, who need to deal with articles written in English most of the times, and whose English level is often lower to the standard level required in academic

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<sup>1</sup> Universidad de la Sabana (Colombia)



institutions. Hence, the need to design a suitable technique that allowed students to access articles in English and focused their attention on key words that would become later the technical vocabulary they would need in order to understand an article more easily from the very beginning. This technique included the design of pre-teaching vocabulary worksheets that led students to identify and use new words in specific contexts for a further comprehension of scientific and academic texts. Undoubtedly, these worksheets require extra time from teachers to design them, but they will serve as the basis to promote learning in a scaffolded way, develop problem solving abilities and critical thinking skills, which altogether will lead them to build meaningful and long life learning strategies. It is worthwhile to refer to Cottrell, (2005) who points out that critical thinking skills involve the “development of observation, reasoning, decision-making, analysis, judgment, and persuasion” which bring lots of professional and everyday life benefits since learners become more accurate and precise on the way the work and think [4].

The worksheets are aimed at making students feel they are able to comprehend content by going from the known to the unknown and from the simple to the complex, becoming aware at the same time of several long life learning vocabulary strategies.

### **Theoretical framework**

Learning to read challenging texts is similar to undergoing physical therapy; painful and exhausting at the beginning but in need of being focused on motivation and persistence to reach the goal (Shanahan, T., Fisher, D., & Frey, N., 2016) [10]. Creating the discipline to read is one of the main challenges students have; therefore, it is important to bear in mind that students are the ones responsible for implementing the techniques suggested by the teacher. This way, they can become autonomous and enlarge their vocabulary range to the extent they need it.

The relationship between vocabulary and reading is reciprocal (Chou, 2011) [3]. That is, the wider range of vocabulary students have, the faster they can read and comprehend a text. However, it is not necessary to know the meaning of every single word in order to understand a text as many students think; reading strategies are the ones that will help to deal with that lack of vocabulary that is not always essential to get the main idea of a text. Jackson & Ash (2012) [5] suggest that students have a deeper understanding of content and better vocabulary skills when they are provided with opportunities to have inquiry-based instruction and multisensory explorations.

Students need meaningful experiences and engagement when learning new words (Wilcox & Morrison, 2013) [12]. Recent reviews of the best practices emphasize the importance of incorporating discussions into content teaching as a means to provide reading comprehension (Lawrence, J. F., Crosson, A. C., Paré-Blagoev, E. J., & Snow, 2015) [6] and content learning. Indeed, Bowman, S., 2014 suggests periodically ask students to discuss the terms with one another [2].

### **Sample and description**

The participants of the study were students from the physical therapy school at a university in Colombia. Their ages ranged between 18 and 20, and they usually found reading scientific articles a difficult skill to be developed due to their lack of vocabulary, reluctance to reading, and lack of practice inside and outside the classroom. Students have taken five previous English levels and currently they are placed at a B1 level according to the Common European Framework of Reference for Languages (CEFR). The sample included 36 students, 18 in the experimental group – students taking English Level 3 as part of their syllabus, and 18 in the control group – students taking a subject proper of the physiotherapy program as part of their syllabus.

The materials in this study were taken from the resources they have in their course syllabus and on actual class texts. The worksheets designed in this project are aimed at assessing students' ongoing performance in reading taking into account their continuous contact with scientific and academic reading of articles in English in their professional life. The study was conducted within the framework of Educational Design Research (EDR). This approach includes the design, development and evaluation of educational interventions as a solution to particular educational problems.

### **Method**

Eight interventions were applied during 16 weeks, two face-to-face hour classes per week. There was a pre-reading test, six interventions using the vocabulary worksheets proposed as the basis of this project and a post-reading test. Students were asked to develop different reading tasks every two weeks. The pre-reading test included a non-academic reading whose main objective was to identify the students' comprehension level when reading a text not related to their field of study. The intention was also to create a comfortable and enjoyable environment for them. During the first intervention



students worked in pairs, promoting collaborative work, broke down a text with no help different from the content itself, and reported what they had read in front of the class. Then, there was whole-class feedback to check understanding and compare versions with the original text. The other five interventions included specific scientific articles that made part of their syllabus together with their corresponding worksheets, which included several vocabulary strategies such as puzzles; unscrambling words; labeling images; vocabulary finders; matching columns, filling gaps in context, cloze questions, and open questions. The Figure 1 shows a sample of the worksheets designed.

### POSTURAL ORIENTATION AND EQUILIBRIUM: what do we need to know about neural control of balance to prevent falls?

**ACTIVITY 1**  
Fill the puzzle with the concepts of the definitions below.

#### PERSPECTIVES ON POSTURAL CONTROL SHAPE

**ACROSS**

4 It is to bring to a successful finish.

6 It is the same as to have as a purpose.

7 States caused by imposed restriction or limitation.

9 When something is shot or prevooged.

10 It determines the dimensions, extent, or amount of something.

11 It is to determine the importance, size or value of something.

15 It is a synonym of "prefer."

16 It is the same as "due to."

17 It refers to a covering of a vast area.

**DOWN**

1 It is a synonym of "increase."

2 It is to guide on the way or to serve as a route.

3 It is the opposite of "gain."

4 Surgeries must be performed \_\_\_\_\_ or free of mistakes.

5 It is to increase in value or quality.

8 Pieces of work imposed by one in authority or by circumstances.

12 Circles have a rounded \_\_\_\_\_.

13 It is the act of filling by the force of gravity.

14 It is the end toward which effort is directed.

**ACTIVITY 2**  
Scramble the words to complete the sentences and definitions below.

**ACTIVITY 4**  
Find the meaning in SPANISH of the words below.

**MOVEMENT STRATEGIES**

C	F	A	W	N	T	T	I	O	Y	
S	O	E	B	F	S	N	O	O	J	X
E	X	J	D	A	O	L	R	T	A	O
V	Q	E	U	C	K	I	C	S	B	W
A	T	R	M	Z	I	E	E	O	F	P
R	P	C	I	H	W	L	D	G	Z	F
T	Z	E	E	J	T	E	U	N	R	G
A	G	R	D	R	Y	A	R	A	G	O
O	R	B	O	O	V	H	A	S	G	Y
B	A	L	A	N	C	E	A	R	S	E
E	Q	R	Q	M	M	X	Y	O	A	E

Through

Sway

Exert

Torque

Narrow

Low

Fear

### THE POSTURAL SYSTEM CONSISTS OF MANY SUBCOMPONENTS

- He walks \_\_\_\_\_ (DPTEISIE) his injury.
- An \_\_\_\_\_ (APARCPDH) is to focus on something.
- A friendly \_\_\_\_\_ (ENTOMNEVRNT) helps people's health recovery.
- \_\_\_\_\_ (ALDLW) is a synonym of "let".
- \_\_\_\_\_ (SUAFRC) is the superficial aspect of something.
- While and \_\_\_\_\_ (WAERHES) have the same meaning.
- \_\_\_\_\_ (SPNITEPG) refers to step which is a combination of foot or foot and body movements in a repeated pattern.
- There are many \_\_\_\_\_ (RSUCEDRES) in Virtual Sappa.
- Mental \_\_\_\_\_ (SGTTRNEH) is essential for physical recovery.
- \_\_\_\_\_ (GIAT) is the same as "walk."
- \_\_\_\_\_ (RIWEGTIHENG) is when people gain weight again.
- \_\_\_\_\_ (EDLLERY) refers to not being young anymore.
- A basic structure is called \_\_\_\_\_ (FMEORWRAK).
- The process of becoming old is called \_\_\_\_\_ (AEINGG).
- \_\_\_\_\_ (LHOIOKLEID) is the same as "probability."

**ACTIVITY 3**  
Label the following images with a word from the box.

**BIOMECHANICAL CONSTRAINTS**  
Picture retrieved from image Google.

STRIKE	PROBE	FORWARD	LEAN	ARROW	BACKWARDS
SIZE	JOINT	PAIN	DOT	FLEX AT THE HIP	JOIN

**ACTIVITY 5**  
Match the concept in column A with its synonym or definition in column B.

**SENSORY STRATEGIES & ORIENTATION IN SPACE**

COLUMN A	COLUMN B
1. _____ lit	a. Perpendicular
2. _____ on	b. Diminish
3. _____	c. Come into line
4. _____	d. Weakly illuminated
5. _____	e. Encircle
6. _____ Support	f. _____ walk for pedestrians
7. _____ Surround	g. Depend on
8. _____ Tilt	h. Incline, lean
9. _____ Upright	i. Injection of information or energy
10. _____ Align	j. Defend as valid

**ACTIVITY 6**  
Complete the sentences with an appropriate word from the box.

**CONTROL OF DYNAMICS, COGNITIVE PROCESSING, POSTURAL CONTROL**

AVAILABLE	WITHIN	PERFORMANCE	CUSTOMISE	SHARE	SKILLED	SET
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- A patient's \_\_\_\_\_ of a task \_\_\_\_\_ a certain period of time may help to \_\_\_\_\_ some balance rehabilitation.
- A \_\_\_\_\_ of strategies should be provided by a \_\_\_\_\_ professional who should also be \_\_\_\_\_ at any time.

Fig 1. Sample of a vocabulary worksheet – second intervention



## Results

Students were assessed during the sixteen weeks through reading summaries, discussions, analyses of content through mind maps and oral presentations showing an improved ability to report on their readings much more confidently and deeply with the plus that they started including new vocabulary when speaking. To sum up, vocabulary plays a very important role not only for improving reading comprehension but also for language proficiency at a whole since it makes the skills of listening, speaking, reading, and writing easier to perform as stated by Paul Nation a linguistic researcher. Furthermore, the acquisition of a wider range of vocabulary has a direct positive effect on reading comprehension, which definitely benefits students' self-confidence and motivation to making reading part of their professional daily work.

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