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Investigating the Reading Difficulties of Magister Students of Physics vis-à-vis Their General English knowledge, University of Constantine

Abstract

This paper reports on a study which investigates the reading comprehension problems and difficulties of magister students of Physics while reading scientific texts and elicits their reading difficulties in English. The results were obtained from a students' questionnaire and a test. The analysis of the data proved that the students' difficulties are due to their linguistic handicap mainly in grammar and vocabulary. Furthermore, it confirms that these students' have a poor level in General English which compounds their reading comprehension difficulties. These results lead us to believe that the teaching/ learning situation of English at the Physics Department, at the University of Constantine should be re-considered. For that, we suggest to implement reading courses to reinforce the students' General English knowledge and promote their reading comprehension of scientific texts

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ملخص

تتناول هذه المقالة موضوع تدريس اللغة الإنجليزية لطلاب الماجستير في الفيزياء بجامعة قسنطينة. حيث تسلط الضوء على الأسباب الكامنة وراء الصعوبات التي تواجه هؤلاء الطلبة في قراءة وفهم النصوص العلمية. كما تهدف إلى البرهنة إلى إيجاد علاقة واضحة بين صعوبات الفهم و بين المستوى المنخفض للطلاب في عموميات اللغة الإنجليزية' بالإضافة إلى الإشارة إلى أهمية إعادة النظر في تدريس اللغة الإنجليزية لطلاب الماجستير في الفيزياء من أجل مساعدتهم في التغلب على صعوبات في القراءة وتحسين الفهم ومن اجل ذلك نقترح ادراج دروس القراءة الى المقررات لتعزيز معرفة الطلاب باللغة الانجليزية العامة وتعزيز فهمهم للنصوص العلمية.

Introduction

Reading is a vital fundamental skill in language learning as being a way of getting information, exploring knowledge and broadening the academic scopes. In fact, reading constitutes a significant source of linguistic input and texts are an important vehicle for information (Johns & Davies, 1983) for learners of English for Specific Purposes and English for Science and Technology. For that reason, there is a growing need to devote more emphasis to promote the student's proficiency in this essential skill. The overriding need for English as being the language of science and technology has resulted in integrating it in the Algerian educational system at all levels. At the tertiary level, English is taught as a compulsory [matter] module in the Science

Faculties. Without doubt, English is significant to the students' academic success, especially for graduate and post-graduate students as most of –if not all- the documentation related to their field of specialism is written in English. More accurately, these learners require English to comprehend texts written in English, which are related to their discipline.

The present article traces the contour of a research conducted for the purpose of exploring the teaching/ learning situation of English at the Department of Physics, at the University of Constantine. We tried to shed light on the students' attitudes towards reading and to investigate the students' reading comprehension difficulties.

Reading in a foreign language is believed to be both a reading problem and an FL problem. Research literature on reading showed that it is difficult to draw a clear distinction how the two factors interact in determining the reading (Alderson, 1984 and Aebersold & Field, 1997). According to Alderson (2000), the nature of reading in a FL is controlled by two variables: the reader and the text. Many aspects of the text can either facilitate or impede the reading process in the FL. More obviously, the reading ability is primarily determined by the learners' proficiency in that language (Anderson, 2000; Wallace, 2003; Hudson, 2007; Hedgcock & Ferris, 2009; Nation, 2009; Grabe, 2009; Lems, Miller & Soro, 2010; Bernhardt, 2011). However, it is claimed that readers are not able to read the FL effectively unless they reach a threshold of linguistic level before they engage in reading (Alderson, 2000).

The real challenge for our students is reading science in English. They constantly struggle with comprehension shortcomings. Our students are expected to read and learn, and as a matter of fact, this cannot be secured unless they comprehend what they read. A large proportion of the learners' reading comprehension difficulties are mainly caused by the language deficiencies they have. Linguistic knowledge is important in reading as it helps readers in the process of constructing their mental representation and the process of how to generate meaning from the text. This is visibly seen with scientific texts for, as it is widely assumed, science is completely different from the other genres of language, namely the language used in GP, as we will see presently.

In effect to address this EST/GE dilemma, and in terms of lexical and grammatical features especially, register analysis has revealed that there is no significant difference in the grammar of scientific English. Furthermore, all the items of scientific discourse do exist in General English (Trimble, 1985; Hutchinson and Waters, 1987), and the only difference that we could highlight is the frequency of occurrence (tendency to favour) of given language items in both GE and ESP/EST discourse. In scientific writing, there are some language aspects and grammatical patterns that are regularly used more than others as they are the best ways for carrying and representing the message. To illustrate these conventions we can take the use of *simple present* to express generalization, *simple past* to express specific experiments and *modality* to make a recommendation or give an instruction. For that, readers should be well equipped to rightly use these language aspects (and others) and be aware of their purpose in use for a better literacy achievement.

The data gathered from this study will be useful to provide EST teachers with a new perspective about teaching English. This is expected to urge them to try to consider G.E. and EST evenly rather than using exclusively EST in their classes in thinking to promote the students' reading proficiency.

2. Research Situation Analysis

This study was conducted at the Department of Physics, the University of Constantine. Among the students of the department, we have purposively chosen magister students to be our research population. From the population of sixty students, a sample of twenty students was randomly selected.

All students studied English at least for six years and they were in the seventh year at the time of the study. However, our sample's responses to the questionnaires revealed these students have different levels of proficiency ranging from average to poor. Yet, the (85%) (in table 01) of the total respondents expressed an intrinsic motivation to learn and read English. Yet, their motivation for learning English is affected by the strong conflict between their perceived language needs and their language wants, as (Boyle.1993) stated. In simpler terms, students' wants and needs are not analogous. What happens is that -as their immediate personal interest, that is their *wants* vary from listening to music, watching movies, chatting and surfing on the net reading short stories, and traveling abroad, -they remain unaware of their instrumental requirements or their *needs* which are basically restricted to using language to gain up-to-date information in their field of specialism. In fact, what they do really need is to have the adequate and the appropriate and necessary level in English that enables them understands what they read.

Table 01. *The Questionnaire Results*

	Your attitude towards learning English		You level of comprehension				Words that affect your comprehension		
Answers	Motivated	Not motivated	Reading the lines	Between the lines	Above the lines	none	General vocabular	Semi technical	Technical words
N. of students	17	03	10	01	00	09	13	02	05
Percentages	85%	15%	50%	05%	00%	45%	65%	10%	25%
Total	100%		100%				100%		

In general, magister students read for the purpose of having basic comprehension of the main ideas of a text, and finding and locating specific information as Grellet (1981) put it "understanding a written text means extracting the required information from it as efficiently as possible" (p.3). In other words, they read to achieve the global understanding of texts and deal with their literal meaning "reading the lines" (Alderson,

2000). Although, it is the least level of understanding they need to accomplish, only (35%, table 01,) of the total respondents (N=20) said they succeed in generating this type of comprehension because they faced different difficulties while reading science texts. For that, they acknowledged that the difficulty they do encounter is not due to the information - *the content* - but it rather results from the organization of the information in the text and from the language in which this information are embedded. They evenly emphasized that they suffer from a linguistic handicap which is the dominant reason for their reading comprehension problems.

To put it in different words, the students' reading comprehension difficulties are compounded by their linguistic shortcomings; namely, grammatical-rhetorical relationships (Trimble 1985), and the non-technical vocabulary both appear to be the major causes of their comprehension problems. Furthermore, many (75%, table 01) of our students believe that terminology is the least cause of their comprehension problems. This may be true for "technical terms are (…) likely to pose the least problems for learners: they are often internationally used or can be worked out from a knowledge of the subject and common word roots" (Hutchinson et al. 1987. p.166).

We will move on to look at other findings obtained from the test that confirm our hypothesis that magister students face many problems while reading scientific English and the low level of these students in GE covers a large proportion of these difficulties.

3. The Test: Description and Administration

The test is mainly used to (i) explore the students' reading comprehension problems and (ii) to assess the students' comprehension vis-à-vis their level in GE. It consists of a text (reading passage) with different activities. The text is an authentic passage extracted from "General Physics" (Landau & Kitaigorodsky, 1978) and the questions are grouped into parts. The first part is meant to evaluate the students' comprehension of the text. It aims at making students locate specific information in the text, find synonyms and antonyms in the text, and fill in the gaps. The second part consists of six questions which evaluate the students' knowledge in GE about grammar; sentence construction, tenses, verbs, adjectives and adverbs.

The test was administered during the regular English session. Students were given enough time (two hours) to read the passage and do the activities. The test results are summarized in Tables 02, 03, 04, and 05 which indicate the students' answers in detail: right, wrong, and blank answers (no answers), as well as the scores of each question.

A detailed look at table 02 shows that the percentages of the students' wrong answers (47.5% and 46.25%) are higher than the percentages of their right answers (40% and 43.12%). In addition, it reveals that the percentages of the 'no answers' are noticeable (12. 5% and 10.6%), and this can only mean that the students don't know how to answer which can be explained by the fact that they have no idea about how to answer the questions and ,thus, they gave no answers. Besides, just 30% (table 03) of the total respondents (N= 20) obtained average and above average scores and, as it was expected (following questionnaire's responses), none of the respondents obtained above the score 15 (Table 03). Based on these results, it seems that the subjects have a poor level in English. Comparing the results of part one to the ones of part two, we

notice that the findings are closely related which means that they do have a poor level in both English general knowledge and poor reading comprehension proficiency. These findings support the claim made above; the students' difficulties are due to their linguistic handicap mainly in grammar and vocabulary.

Table 02. *Students' Scores of Part one and*

Answers	Part One		Part Two	
	N. of students	percentage	N. of students	percentage
Right answers	96	40%	69	43.12%
Wrong answers	114	47.5%	74	46.25%
No anwsers	30	12.5%	17	10.6%
Total	240	100%	160	100%
	400			

Table 03. *Summary of the Students' Scores*

Scores	N. of students	Percentage
00 – 04	03	15%
05 –09	11	55%
10 - 14	05	25%
15	01	05%
16 - 20	00	00%
Total	20	100%

4. Discussion of the Results

Table 04 below summarizes the subjects' scores of reading comprehension activities'. A critical reading of these results reveals that magister students have many comprehension problems, the percentage of the wrong answers (47.5%) and the no answers (12.5%) is the best illustration. In other words, the most important findings to appear from the data (Table 04) is that the majority of the respondents failed in understanding the passage. The subjects' poor knowledge in General English creates a hurdle in comprehending what they read. Without doubt, it is impossible to read and understand without having a reasonable store of linguistic knowledge (Grabe 2009).

Table04 .*Students scores in Part One*

Questions		Right answers		Wrong answers		No answers	
		N.of students	%	N.of students	%	N.of students	%
General comprehension	Statement a	15	75%	05	25%	00	00%
	Statement b	12	60%	08	40%	00	00%
	Statement c	05	25%	15	70%	00	00%
Locating specific information	Question A	10	50%	09	45%	01	05%
	Question B	05	25%	11	55%	04	20%
Inference	Synonyms	04	29%	14	60%	02	10%
		05	25%	11	55%	04	20%
	Antonyms	16	80%	01	05%	03	15%
		08	40%	05	25%	07	35%
Filling the gaps	Statement a	06	30%	12	60%	02	10%
	Statement b	05	25%	10	50%	05	10%
	Statement c	04	20%	14	70%	02	10%
TOTAL (240)		96	40%	114	47.5%	30	12. 5%

Following the finding to activity one which aims at checking the students' general understanding of the text, many students succeeded achieving this level of comprehension as the average of the correct answers (53.3%) shows. On the contrary, the findings form activity two, reveals that the majority of the respondents have not comprehended the passage as the average of the right answers in only (37.5%) indicates. It is important to say that this result do not support the result of the previous activity. To explain this contradiction, we need to have a careful examination at the findings of both activities (statement a, statement b, statement c, for activity one, and question 01 and question 02, for activity two). In fact, the high percentages of activity one, they may have been affected by nature of task itself. Unlike the rest of the tasks, students did not refrain from answering even though they did not know the right answer, but rather subjects prefer to put random answers -rely on chance-.

Based on the findings shown in Table 4, there is an obvious decrease in the percentages of the right answers; statement a (75%), statement b (60%), statement c (25%) and question 01(50%) and question 02 (25%). These variation across the findings was quite expected (questionnaire responses) by the researcher who intended to increase the complexity of the question asked in order to test out their knowledge their General English (GE) vis-à-vis their comprehension. This findings have proved the students' have linguistic shortcomings.

Almost all the students failed in expressing their understanding accurately as they have made a considerable number of mistakes; namely, confusing verbs and nouns, misusing tenses, ignoring the rules of singular and plural, overlooking punctuation, and abuse conjunctions to combine meaningful sentences. For the rest of the students, they answered by coping sentences from the text word for word and most of their answers *do not answer* and are completely irrelevant to the questions asked. These results are consistent with our hypothesis which states that the magister students of physics have deficiencies in the basic simple grammatical structures and vocabulary

items which appears to be the significant reason for their comprehension problems. Strong evidence on the students' lack of competency in GE is also found in the students' answers to the question of inferring. Although students were asked to give synonyms and antonyms to general vocabulary words (non-technical terms); yet, the average of the right answers (table 02) in no more than 43.5%. This result confirms what the respondents have said earlier, (table 01), that general vocabulary creates a hurdle for the respondents' comprehension.

The last activity (filling the gaps), only 25% of the total respondents (N=20) answered correctly, which illustrates one more time that the subjects have not understood what the text is about. Similarly, subjects' answers to this question show their lack of linguistic knowledge, mainly about part gender and number. To put these facts into perspective, we can say that the students have low comprehension achievements, and their poor GE knowledge appears to be the main cause which compounded their problems and difficulties of understanding.

Putting it differently, the data in Table 05 can be connected with the data in Table 04 in proving that magister students of physics have a low GE level. As it is indicated in Table 05, (60%) of the respondents failed in giving the right number of sentences in the last paragraph. Indeed, their answers reveal that these students have different wrong concepts about what a sentence is. For instance, they consider each line as a sentence, a series of words between two commas, or a series of words between any other punctuation marks as a sentence, too. Moreover, (75%) of the total respondents gave wrong answers when asked to count the number of passive sentences in the passage. The passive - which is widely used in the scientific discourse - is the other weakness magister students have.

Table 05. *Students' Scores in Part Two*

Questions	Right answers		Wrong answers		No answers	
	N. of students	%	N. of students	%	N. of students	%
Number of paragraphs	17	85%	03	15%	00	00%
Number of sentences	08	40%	12	60%	00	00%
Number of passive sentences	05	25%	15	75%	00	00%
Tense used in the passage	04	20%	10	50%	06	30%
Extracting adjectives	03	15%	14	70%	03	15%
Extracting adverbs	06	30%	07	35%	07	35%
Extracting present verbs	12	60%	08	40%	00	00%
Extracting past verbs	14	70%	05	25%	01	05%
Total (160)	69	43.12%	74	46.25%	17	10.62%

It is also noticeable that In fact, the students of our sample not only have problems with sentence structure but also with tenses; in particular the present and the past tenses which are frequently found in EST texts (Trimble 1985). In this respect, only (20%), in table 05, of the subjects gave right answers in identifying the tense used in the text; against, (75%), in table 05, of them who gave right answers in extracting verbs from the text (past and present). Having a scrutiny at the subjects' answers can wealthily explain the variations in these results, as (80%) table 05 of the right answers concerning extracting from the passage verbs conjugated in the present simple from passage our respondents sorted out the auxiliary 'to be' and 'to have' [is- are- has- have] against a small proportion (16.66%, in Table 06) who could find out verbs such as: "decreases"- "consist" "grows". Similarly, in extracting past tense verbs from the passage, students' right answers (07.14%, in Table 06) are restricted to the regular verbs with the final 'ed' [created, called, determined, etc] apart from two answers [built up-made].

In the same line of thoughts, subjects don't only have limited knowledge of past verbs (only regular verbs) but they also confuse between adjectives and past verbs; i.e., they considered all the words ending in 'ed' as past verbs; namely, the adjectives 'complicated' and ' involved' were frequently repeated in their answers. Further examination showed that they also confuse between what the adjectives and the adverbs. Many of the respondents put adverbs when they are asked to find adjectives, and vice versa.

Table 06. Verbs Extracted

Answers	Present verbs		Past verbs	
	Auxi. (have /be)	Other verbs	Auxi. (have /be)	Other verbs
N. of students	10	02	13	01
Percentage	83.33%	16.66%	92.85%	7.14%
Total	12 (100%)		14 (100%)	

In short, these results have made it clear that magister students- of our interest- have a poor knowledge in GE, and can be considered as "false beginners" in English (Steinhausen. 1993). In other words, the subjects are not equipped with the linguistic package needed to study English at the university level.

In evaluating the two findings of (Part One and Two), it can be understood that the students' poor knowledge of GE is the most significant factor that seems to have dominated the causes of their reading comprehension problems. A possible explanation for such a linguistic handicap in grammar and vocabulary might be that they regard English as a 'minor' subject, and hence devote less attention to it as a foreign language, but tighten their interest in just getting a pass mark. Consequently, the majority of the students end up each step of their learning with a little knowledge of GE, the result of which is a gap in their proficiency -which in its turn poses a real crucible to teachers in choosing a text, activities, and tasks that suit all the disciplines and in satisfying the students' needs and wants. From our early discussion, we see that teachers are in dire need for a new perspective in teaching English to magister students of physics through re-considering the teaching of GE and make learners skillful with the basics of the English language. Implementing GE reading courses as we very much expect will help

learners build their vocabulary repertoire and reinforce their knowledge in grammar and promote their English literacy. This would then lead to a sound improvement in their reading comprehension proficiency.

Conclusion

This study has been concerned with investigating the reading problems and difficulties faced by magister students by examining the relationship between their knowledge of G.E and their reading comprehension proficiency. The results obtained from both the questionnaire and the test support the belief that if magister students of physics have an adequate knowledge in G.E (grammar and vocabulary), they are expected to alleviate their reading difficulties and promote their reading proficiency.

This study has been able to demonstrate that Magister students of physics require a re-teaching of English. Apart from this, GE cannot and should not be separated from EST teaching as it is the only way that we expect, in the long run, to lead to improvements in how students behave and react to any text they would read. Hence, we believe that in the Department of Physics, at the University of Constantine, and by extension in the other similar departments of our universities, the teaching of GE should urgently be reconsidered, and reading course should be implemented as well.

In short, for that, we recommend that teachers as well as decision-makers to

- Make students more eager to learn English by explaining the crucial importance of this language and raising their motivation to learn through reading any texts about their field of specialism that meet their expectations and interests.
- Well consider the learners' needs and wants, their level in English, and the time and the number of sessions devoted for the English session.
- Integrate G.E courses within E.S.T courses. Such courses will serve –it is hoped- as foundation courses that will create a real communication in the classroom. By enriching the students' linguistic background and reinforcing their efficiency in reading and learning English.
- Focus on reading since it is the main needed skill~~s~~ for the E.S.T learners by implementing reading courses.

As our bottom line, we deeply hope that these findings and suggestions will be taken into consideration while reconsidering teaching General English to Physics students. We evenly hope that the teaching of EST. will be considered with enough care and affection by future teacher in the departments of physics across the country.

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