

Investigating the Reading Difficulties of Algerian EST Students with Regard to their General English Knowledge

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Abstract

This paper reports on a study which investigates the reading comprehension problems of master students of Physics while reading scientific texts in English as a foreign language. It aimed at testing a hypothesis of a causal relationship between two variables; students' GE knowledge and reading comprehension. 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 1 should be re-considered. In other words, the results proved that there exists a gap between GE and EST teaching. For that, we suggest to implement reading courses to reinforce the students' General English knowledge and promote their reading comprehension of scientific texts

Keywords: linguistic knowledge, GE/ EST dilemma, reading skill, reading comprehension difficulties.

Introduction

The overriding need for English as the language of science and technology has then resulted in its integration in the Algerian educational system at all levels. At the tertiary level, English is taught as a compulsory 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 the documentation related to their field of specialization is written in English. More accurately, these learners require English to comprehend texts written in English, which are related to their discipline. In other words, 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 / 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. This study is conducted for the purpose of exploring the teaching/ learning situation of English at Physics Department, University of Constantine 1, shedding light on the students' attitudes towards reading and investigating the students' reading comprehension difficulties.

Reading Science in English as Foreign Language

Research literature on reading showed that it is difficult to draw a clear distinction between SL and FL reading (Alderson 1984). In fact, reading in a Foreign Language (FL) is more or less the same process as in the first language or second language (Davies, 1995), except, texts are written in a FL. According to Alderson (2000), the nature of reading in a FL/SL 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 in a FL is primarily determined by the learners' proficiency in that language (Alderson, 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 effectively in a FL unless they reach a threshold of linguistic level before they engage in reading (Alderson, 2000).

Reading science in a FL is a real challenge for science learners who are in constant struggle with comprehension shortcomings. These readers are reading to learn and their learning cannot be ensured unless they comprehend the text they read. A large proportion of the reading comprehension difficulties are mainly caused by the language deficiencies students have. Linguistic knowledge is important while reading as it helps readers in the process of constructing the mental representation and the process of generating the meaning from the text. It is widely assumed that science is completely different from the other genres of language, namely the language used in GE.

To address this EST/GE dilemma, register analysis (in terms of lexical and grammatical features) 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), 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. Therefore, readers should be well equipped with such language aspects and be aware of their purpose in use for a better literacy achievement.

In this paper, we attempted to explore Algerian EST learners' difficulties in reading scientific texts and highlighting the causes behind such difficulties. In addition, the data gathered from this study will be useful to provide EST teachers with a new perspective about the teaching of English at EST institutions for the purpose of overcoming students' reading comprehension problems

Research Design

Participants

This study was conducted at the Department of Physics in the University of Constantine 1. Among the students of the department, we have chosen magister students to be our research population because of two main reasons. First, it is because I was a former student in the scientific stream, who knows such difficulties with the English language. Second, it is our permanent contact with our friends -magister students- who constantly talk about their problems with GE. From the present population, sixty students, we have randomly selected a sample of twenty students. All students studied English at least for six years, five in secondary school and one year in university and they were in the seventh year at the time of the study.

Data Collection Tools

Two research instruments are used in the present study to test the hypothesis: a questionnaire and a test.

The Questionnaire: Description and Administration

The students' questionnaire consists of nineteen closed items designed on the basis of the answers we got from the pilot study. This questionnaire is made up of short questions written in simple English to make them easy to understand. They are grouped in three sections: personal and academic information, students' needs and problems with English, especially with General English, and their reading difficulties.

Concerning the administration of the students' questionnaire, it was directly handed to respondents during their regular English session. The students' sample was given enough time to read and to answer each item carefully. We have given them the right to ask for further explanation about the meaning of any item or any word. These questionnaires were completed under our supervision and were collected right after they were completed. We have tried to be sure that every student completes his/ her questionnaire alone.

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 with regard to their level in GE. It consists of a text (reading passage) with different activities. The text is an authentic passage extracted from a book entitled "*General Physics*" and the questions are grouped into parts. The first part is meant to evaluate the students' comprehension of the text. It also 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 where students were given enough time (two hours) to read the passage and do the activities.

Results and Discussion

Apart from the sample subjects' responses to the questionnaires submitted, we can say that these students range from different levels of language proficiency on the one hand, and using Trimble (1985) words, different levels in subject knowledge on the other hand. Yet, the majority (85%) of the total respondents expressed an intrinsic motivation to learn English as a

foreign Language and to become skilled at reading. Still, their motivation for learning English is affected by a strong conflict between their perceived language needs and their language wants, as Boyle (1993) stated. Their wants were related to immediate personal interest, namely: listening to music, watching movies, chatting and surfing on the net reading short stories, and traveling abroad), whereas they expressed their unawareness of needs or their instrumental requirements which are basically restricted to using language to gain up-to-date information in their field of specialization.

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, p. 3). put it “understanding a written text means extracting the required information from it as efficiently as possible”. 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 that they need to accomplish, not all students, only (35%) of the respondents, succeed in generating this type of comprehension because they face different difficulties while reading science texts. Accordingly, they acknowledged that the difficulty they encounter does not result from the information (content) rather it results from the organization of the information in the text and from the language in which this information are embedded. Besides, they emphasized that they suffer from a linguistics handicap which is the dominant reason for their reading comprehension problems. Ultimately, we can say that students’ reading comprehension difficulties are compounded by their linguistic shortcomings; namely, grammatical-rhetorical relationships (Trimble 1985) and non-technical vocabulary appear to be the major causes of their comprehension problems not the technical terminology as 75% of the respondents stated. This may be true as Hutchinson and Waters (1987) say "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" (p.166).

We will move on to look at other findings obtained from the test that are going to confirm what we hypothesized above: that magister students face many problems while reading scientific texts and the low level of these students in GE covers a large proportion of these difficulties. The test results are summarized in Tables 01, 02 and 03 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 these tables shows that the subjects encountered problems and comprehension difficulties as their wrong answers (47%) are higher than their right answers (41.25%). It is important to say that the percentages of the ‘no answers’ are noticeable (11.75%), 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 35% 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 14.

Table 01
Students’ Scores

Answers	Part One		Part Two	
	Nbre of answers	Percentage	Nbre of answers	Percentage
Right answers	96	40%	69	43.12%
Wrong answers	114	47.5%	74	46.25%
No answers	30	12.5%	17	10.62%
Total	240	100%	160	100%

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Discussion of the Results

A critical reading of the subjects' answers summarized in table 02 proves that magister students have many comprehension problems and these are caused by their poor knowledge in General English (43.12%), in particular with the basic simple grammatical structures and vocabulary items as we will see in the discussion below.

Table 02
Students' scores in part one

Questions		Right answers		Wrong answers		No answers	
		N.students	%	N.students	%	N.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%

As an illustration, Table 02 shows that 47.5% of the students' answers of part one are wrong which means that many of the respondents failed in understanding the passage. Besides, it reveals the different comprehension problems that subject respondents have, that basically result from their General English (GE) linguistic shortcomings. Without doubt, it is impossible to read and understand without having a reasonable store of linguistic knowledge (Grabe, 2009).

In response to the comprehension questions, which aim at checking both the students' general and detailed understanding and assessing their ability in using language to answer, only 37.5% of the total respondents have answered both questions correctly which reveals that the majority of the respondents (62.5%) have not comprehended the passage. Interestingly, almost all the students who understand the text 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 abusing conjunctions to combine meaningful sentences. The rest of the students answered by copying sentences from the text word for word and most of their answers are irrelevant to the questions asked.

Strong evidence on the students' lack of competency in GE is also found in the students' answers to the question of inferring. Although students are asked to give synonyms and antonyms to general vocabulary words (non-technical terms), the average of the right answers is no more than 43.5%. Furthermore, in the last activity of filling the gaps, the number of respondents who answered correctly is only 25% which illustrates one more time that the subjects have not understood what the text is about. Similarly, subjects' answers to this question show the students' lack of linguistic knowledge mainly about parts of speech, gender, and number.

Comparing the results of Table 02, we notice that there is a variation in the scores obtained in the different activities; for instance, activity one unlike the rest of the tasks, students gave (00%) no answers. Having no blank answers in this task is explained by the fact that most of subjects prefer to put random answers -rely on chance- if they fail in understanding the statement or the text. Comparing students' scores in statement 'a', 'b' and 'c' can clearly

illustrate the point, only few students did understand the meaning of statement ‘c’ because they were unable to guess the meaning of the verb ‘built up’.

To put these facts into perspective, we conclude that students have low comprehension achievements and students’ poor GE knowledge is the main cause which compounded their problems and difficulties of understanding.

Table 03
Students’ scores in part two

Questions	Right answers		Wrong answers		No answers	
	N.students	%	N. students	%	N. 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%

Similarly, the data obtained from Table 03 can be connected with the data in Table 02 in proving that magister students of physics have a low level in GE. As Table 03 indicates, the majority of the respondents (60%) failed in giving the right number of sentences in the last paragraph. This result is well explained by examining their answers which reveal that these students have different wrong concepts about what a sentence means. 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. As a matter of fact, magister students have also problems in identifying the passive sentence which is widely used in scientific discourse. In fact, subjects 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% of the subjects gave right answers in identifying the tense used in the text which is the present. ∴ Having a scrutiny at the subjects’ answers when asked to extract verbs from the text in both past and present tenses reveals that all students’ answers, except three: decreases- consist-grows, range from the auxiliary ‘to be’ and ‘to have’ [is- are- has- have] Similarly, in extracting past tense verbs from the passage students’ right answers 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 thought, 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.

In short, these results have made it clear that the magister students- under investigation- have a poor knowledge of GE, to use (Steinhausen, 1993) words they are “false beginners” in English. In other words, the subjects are not equipped with the linguistic package needed to study English at the university level.

Comparing the findings of both Part One and Two, it is noticeable that students’ not only have poor knowledge of GE but also poor comprehension level. It appears from this that the lack of linguistic knowledge is most significant cause of their reading comprehension problems. Students proved to have problems at both word and sentence level.

The possible explanation for the students' linguistic handicap in grammar and vocabulary is they regarded English as a 'minor' subject compared to other subjects like math, physics and science. Hence, less attention is devoted to it and all what students care about is getting a pass mark. Consequently, the majority of the students end up each step of their learning at high school and even in early stages at university with a little schematic information a shortage in knowledge of GE. Most students are not aware of the importance of English as the international language of science and technology until they become post graduate students.

From the earlier discussion, we see that EST teachers are in a dire need for a new perspective in teaching English to magister students of physics through re-considering teaching GE and make learners skillful with the basics of the English language. In so doing, we suggest implementing GE reading courses as we very much expect will help learners build their vocabulary repertoire, reinforce their knowledge in grammar and promote their English literacy. Ultimately, 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 the students' knowledge of GE and their reading comprehension proficiency. The results obtained from both the questionnaire and the test support the belief that if the magister students have an adequate knowledge in GE (grammar and vocabulary), they will alleviate their reading difficulties and promote their reading proficiency. This study has been able to demonstrate that the inadequate level in GE is a prime obstacle that prevents magister students of physics from reaching comprehension in dealing with scientific texts. As a result, 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, which can lead to improvements in how students behave and react to any text presented to them, or any text they would read. Hence, we believe that in the Department of Physics, of the University of Constantine, and by extension in the other Algerian universities, the teaching of GE should urgently be reconsidered and reading course should be implemented as well. Finally, we deeply hope that these findings and suggestions will be taken into consideration while reconsidering teaching General English to Physics students.

For that, we recommend teachers to focus their attention on these points:

- Make students more eager to learn English by explaining the crucial importance of this language and raising their motivation to learn through choosing interesting texts. By interesting, we mean texts about their field of specialisation that meet their expectations and interests, suit their level in English, and satisfy both their needs and wants.
- Well consider the learners' needs and wants, their level in English, and the time and the number of sessions devoted to the English session.
- Integrate GE courses within EST courses. These GE courses serve as foundation courses that will create a real communication in the classroom using General English and Scientific English. Enriching the students' linguistic background and reinforcing their efficiency in reading and learning English.

- Focus on reading since it is the main skill needed for the EST learners by implementing reading courses.

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Appendix A : Students' Questionnaire

We would like to ask you to answer the following questions. Please put (x) in the appropriate corresponding box.
Thank you in advance.

1. Age: Gender: Female Male

2. Is your option of speciality:
 Matériau.
 Energétique
 Théorique
 Rayonnement
 Astrophysique

- Energierenouvelle
- Cristallogaphie.
3. Do you like studying English?
yes no
4. Did you consider English as important as the other matters you studied?
important ; important as re important not portant
5. Do you like the time (the timetable) of the English session?
acceptable suitable not suitable
6. What do you think of one session of English per week?
enough not enough
7. What do you think of the courses given by the teachers?
just good good boring
8. Do you do classwork (exercice d' application)?
yes no
9. Do you think it is important to study English this year especially that next year you are going to prepare your dissertation?
yes no
10. What do you need English for?
Answer exam questions write scientific reports listen and understand read documents
11. What type of English do you need (want) to learn?
terminology t study grammar and vocabulary translatio
12. Do you read in English?
yes no
13. If yes, how often do you read in English?
always often metimes rarely never
14. If you read, what do you read in English?
newspapers short stories tex doc ent in your field of interest
15. If you read, do you have difficulty?
yes no
16. If yes, how often do you have difficulty in reading?
rarely sometimes en always
17. In reading you understand:
only words g eral idea gen l idea with details all the text
18. Your problems of understanding are due to:
vocabulary grammar scientific knowledge

Appendix B: Test

Structure of Matter

Matter is anything that has both mass and. It is made up of molecules. Molecules consist of atoms. Atoms are bound in molecules by forces which are called chemical forces. There exist molecules consisting of two, three, four atoms. The largest molecules, protein molecules, consist of tens and even hundreds of thousands of atoms.

The molecule kingdom is exceptionally varied. By now, millions of substances built up out of various molecules have already been isolated by chemists from natural materials and created in their laboratories.

Properties of molecules are determined not only by how many atoms of one or another sort participate in their construction but also by the order and configuration in which they are bound. A molecule is not a heap of bricks, but a complicated architectural structure, where each brick has its place and its completely determined neighbors. The atomic structure forming a molecule can be rigid to a greater or lesser degree. In any case, each of the atoms carries out an oscillation about its equilibrium position. In certain cases, some parts of a molecule can even revolve around other parts giving different and the most fantastic configurations to a free molecule in its process of its thermal motion.

The interaction between atoms has a characteristic form, it first goes down, then turns up forming a "well", and afterwards rises more slowly towards the horizontal axis on which the distance between the atoms is marked. The distance from the vertical axis to the bottom of the well can be called the equilibrium distance.

When atoms are at a great distance from each other, they are attracted; this force decreases rather rapidly with an increase in the distance between them. As they approach each other, the force of attraction grows and reaches its maximum value when the atoms come very close to each other. As they come even closer, the attraction weakens and, finally, at the equilibrium distance the force of the interaction vanishes. When the atoms become closer than the equilibrium distance, forces of repulsion arise which sharply increase and quickly make a further decrease in the distance between the atoms practically impossible.

(Adapted from *Molecules* by Landau & Kitaigorodsky, pp. 29-31)

Difficult vocabulary items:

- | | |
|------------------------|---------------------------|
| Molecule: particle. | Brick: element |
| Equilibrium: balance. | Rigid: inflexible |
| Oscillation: wavering. | Revolve: circle. |
| Interaction: contact. | Heap: pile. |
| Axis: alignment. | Thermal: containing heat. |

Questions

Part one:

1. Say true or false.
 - a. Properties of molecules are determined only by how many atoms participate in their construction.
 - b. Variant molecules build millions of substances.
 - c. Each brick is randomly placed in the structure of the molecule.
2. How is matter structured?
3. Does the distance between the atoms affect the attraction force?

4. a. Find in the text synonyms for the following:

Made up = matter =.....

b. Find in the text antonyms for the following:

Slowly ≠ backward ≠.....

5. Complete the following sentences :

- a..... are the smallest particles of pure chemical substances .
- b..... is a basic unit of matter.
- c.....are those links between the atoms.

Part Two:

1. How many paragraphs are there in the text?
.....
2. How many sentences are there in the last paragraph?
.....
3. How many passive sentences are there in the first paragraph?
.....
4. What is the tense used in the text?
.....
5. Find in the text two adjectives and two adverbs.
.....
6. Find two verbs in the past and two in the present in the text.
.....