Secondary Education Scientific Texts' Reading Aspects: Challenges and Techniques

HANIFI Aissa
Hassiba benbouali university of chlef,
a.hanifi@univhb-chlef.dz,

Received date : 2019/04/09 Publication date: ***2021/09/30***

Abstract

Most secondary school EFL teachers in Algeria claim that their students encounter real difficulties to understand scientific texts inserted in their English textbook. This study has attempted to investigate the major factors that influence the scientific texts' reading task and hinder the third year secondary school students' ability to understand such type of texts. These factors incorporate mainly some English scientific text features and actual psychological handicaps that prevent students from having an easy access to scientific texts comprehension. To achieve these aims, The study used the data of gathered from students' questionnaires that revealed interesting findings .The study showed that most students did not show much motivation to study English let alone dealing with English text related to scientific topics. The students attributed part of their failure to deal with English scientific texts' reading to the technical vocabulary and the complex sentence structure that often characterise such type of texts.

***Key words**: EFL teachers English scientific text motivation scientific topics*

Résumé :

La majorité des enseignants d'anglais en enseignement secondaire en Algérie revendiquent que leurs élèves rencontrent de vraies difficultés pour comprendre les textes scientifiques insérés dans leur manuel scolaire d'anglais. Par conséquent, cette étude vise à étudier les facteurs principaux qui influencent l'activité de lecture des textes scientifiques, et entravent des étudiants de troisième année secondaire à les comprendre. Ces facteurs incorporent principalement des caractéristiques de textes scientifiques en anglais et des handicaps psychologiques réels qui empêchent les étudiants de comprendre facilement ces textes. Et pour atteindre ces objectifs, l'étude a utilisé les données recueillies à partir des questionnaires adressés aux étudiants qui ont révélé des résultats intéressants. Cette recherche a

démontré que la plupart des étudiants n'était pas seulement motivée pour étudier des textes scientifiques en anglais, mais même d'apprendre la langue anglaise elle-même. Les étudiants ont attribué une partie de leur échec à la lecture de textes scientifiques anglais au vocabulaire technique et à la structure complexe des phrases qui caractérisent souvent ce type de textes.

Mots clés : *enseignants d'anglais textes scientifiques handicaps facteurs*

ملخص

صرح معظم أساتذة اللغة الإنجليزية في المدارس الثانوية في الجزائر أن التلاميذ يواجهون صعوبات في فهم النصوص العلمية المدرجة في الكتاب المدرسي باللغة الإنجليزية. وعليه، تروم هذه الدراسة بحث العوامل الرئيسية التي تؤثر على نشاط قراءة هذه النصوص العلمية، مشكلة عائقا لتلاميذ السنة الثالثة لاستيعاب هذا النوع من النصوص .إذ تتضمن هذه العوامل بشكل رئيسي بعض سمات النصوص العلمية الإنجليزية والعوائق النفسية الفعلية التي تمنع التلاميذ من فهمها بسهولة. ولتحقيق هذه الأهداف، استعانت الدراسة بالبيانات التي تم جمعها من استبيانات وجهت للتلاميذ. وقد أبانت عن نتائج مثيرة للإهتمام ، تمثلت في أن معظم التلاميذ لم يبدوا تحمسا كبيرًا لدراسة اللغة الإنجليزية ، ناهيك عن التعامل مع النصوص الإنجليزية ذات الصبغة العلمية .حيث أرجع التلاميذ جزءًا من فشلهم هذا في التعامل مع النصوص العلمية الإنجليزية إلى المفردات التقنية وتركيبة الجملة المعقدة التي غالباً ما تميز هذا النوع من النصوص.

الكلمات المفتاحية : اللغة الإنجليزية النصوص المفردات التقنية الجملة المعقدة

Introduction

Reading is an essential skill for learning English as a foreign language. For secondary school students, reading is an important skill that they need to master in order to understand the selected texts in their English textbooks. Secondary students have also to manage the reading comprehension skill in order to do well in their school

exams. Thus, reading is a very significant skill in the process of the foreign language learning in general. However, the teaching experience has shown that students in the Algerian secondary school still face some difficulties to gain full control over the reading comprehension skill. One can notice this fact through a simple look at the students 'reading assessment grades which are still low and unsatisfactory. This is the situation for reading texts that carry general aspects (non –specialised texts) .The situation would seem more serious if we want to talk about reading more specialised texts such as reading English scientific texts which will be our focus in this dissertation. In fact, secondary school students still find real difficulties to understand English scientific texts and to do reading comprehension activities and tasks related to that field of topics. They often also feel anxious while being confronted with scientific texts and claim to have a "mental block" against understanding texts written in scientific language. Moreover, teachers in the secondary school can plainly notice that although there is a clear difference between literary and scientific texts in terms of language usage (selected vocabulary, structure of sentences and style) and objectives of the discourse, the selected types of the different reading comprehension tasks and activities are much more similar (reference or inference questions, true or false statements, multiple choice questions, table completion, ect..).

Teaching and Learning Scientific texts in the EFL context

It is useful to proceed with a highlight of some major concept characterising the scientific discourse and the most prominent factors that are involved in the reading anxiety of English scientific text by EFL learners and that can influence their reading comprehension ability to such type of text. This will include the main purpose of teaching reading in general, some definitions and theories related to the different reading skills.

Definition of Reading

Reading is one of the four language skills that was for a long time of minor importance in comparison to speaking and writing. The latter have often been considered as active skills while reading and listening as passive. However, many linguists do not agree on the dichotomy of passive and active skill in the sense that reading is regarded as an active and creative mental activity. Goodman (1996: 90), for instance, argues that "Readers have an active brain that they actively use to make sense of written language".

The interactive model appeared to join both bottom –up and top-down models together for an active reading process that readers may find it useful to decode and understand any sort of written texts.

Interactive Model

As an aftermath of the assumption held by theorists who recognised the importance of both the reader and the text in the reading process, the interactive reading emerged. It simply denotes, as its name suggests, an interaction between the reader and the text. It is about using both top-down model and bottom-up skills. McCormick (1988) asserts this fact when he states that the interactive model attempts to amalgamate both features of top-down an bottom-up models by taking into account the strong points of both models, and tries to avoid the criticisms levelled against each , making it the most promising approaches to the theory of reading today. Moreover, a skilled reader must be able to make use of sensory, syntactic, semantic, and pragmatic information to accomplish the task. These various sources of information appear to interact in many complex ways during the process of reading.

As a matter of fact, our main concern in this study is focusing on a type of reading of much more specific type of texts which is the English scientific text. Hence, more focus will be specific type of texts whose register is far from general purpose English reading (GPE) and seems closer to English for specific purposes texts' reading (ESP) ;it is more precisely related to English for science and technology field (EST).

Definition of ESP

ESP is appropriately defined by clarifying its position towards the rest of ELT (English Language Teaching).Hutchinson and Waters ELT tree analogy provides a clear description for this purpose (see figure 1)

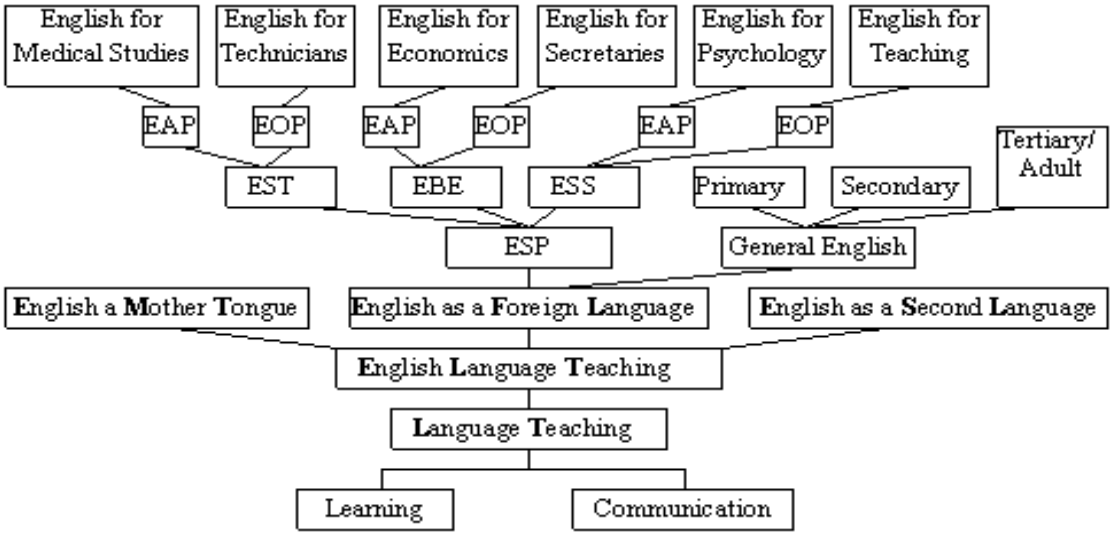

Figure 1: ELT Tree (adapted from Hutchinson and Waters, 1987, p.17)

The ELT tree diagram above shows clearly that ESP belongs to the English Language Teaching (ELT), so what makes it different from the other ELT subcategories?

The term ESP has been defined by many scholars. Robinson (1980, p. 98), for instance, cites fifteen scholars who have attempted to define ESP. This would suggest that there are many opinions and considerable debates seeking an accurate definition to the concept. Strevens (1980, p.109) observes that 'a definition of ESP that is both simple and watertight is not easy to produce'. However, the term has been defined by a number of scholars. Robinson (1980) has stated that ESP is the teaching of English to the students with specific objectives and purposes which might be professional, academic, scientific etc... .So it is this 'S' which differentiates the ESP concern of ESP from that of ELT by making it more focused on specific learner's needs and language purposes as stated by Hadley (2006 , p. 3) that "the key to teaching ESP is to focus on the "S" for specific. ESP can be differentiated from general ELT by its concern with specialized language and practice".

Because ESP teaching depends and varies according to the learners' needs and the context in which English is used, different types of ESP emerged to cover important disciplines that represented the different learners' needs.

English for Science and Technology (EST)

English for Science and Technology (EST) has been often considered as one of ESP major subdivisions. It is an approach to teach English scientific discourse. It has already been mentioned in the course of ESP development that there were an increasing number of scientists and technologists who needed to learn English for a number of purposes related with special technical field. Thus, EST emerged as an adequate branch of ESP with the aim to satisfy those learners' needs. In this regard, Kennedy & Bolitho (1990) again state that much of the demands for ESP have come from scientists and technologists who need to learn English for a number of purposes connected with their specialisms.With regard to the current study objective , EST learners have one major challenge which is the ability to understand scientific texts written in English.Similar to other ESP branches, the EST texts are characterised by compressed and condensed language , their complex grammar structures , inexplicit semantics and nominalised phrases. The current study will shed light on each of these scientific texts' discourse features and seek to find reading strategies that would help EST learners overcome the challenge of understanding scientific and technical written texts.

Procedures Analysis of the Findings

As already depicted in the introduction part of this research paper, the current study relied on two main tools to collect the necessary data; a questionnaire for secondary school class students and a class observation with the English class teacher. The students' questionnaire aims at detecting the main difficulties that the students face while reading English scientific texts and discover their attitude towards that type of text. The class observation has primarily the

purpose of getting closed to both the students and the teacher while being involved in an English scientific reading session to observe and identify the major aspects and the prominent teaching learning landmarks characterising the target reading session. The study envisaged the third year secondary science students mainly for two reasons:

1-They have encountered scientific passages in their English textbooks mainly for two years.
2- Being of scientific branch may motivate them more to take part of the current research and let them know about their real problems in reading science texts written in English.

Other information concerning the target students' group of under the current study focus is summed up in the following table:

The Students' Class Level	*3rd year secondary school*
The Study Branch	*Scientific Stream*
The Number of Students	*27 students(17 girls and 10 boys)*
The Years of English Learning	*6 years*
The Number of English Teaching Hours per Week	*3 hours*
The Degree and Qualification of the teacher of English	*B.A Degree*
The Teacher 's Experience	*7 years of English Language Teaching*

Table 1 : The Students' Profile

Students' Questionnaire

The questionnaire consists mainly of a number of multiple choice questions. These questions are grouped into two main categories:

- ✓ *Students' attitudes to scientific texts' reading*
- ✓ *Reading scientific texts' strategies*

Data Analysis

1-Students' Attitudes to scientific texts' reading

A- Students' degree of attraction to English scientific texts :

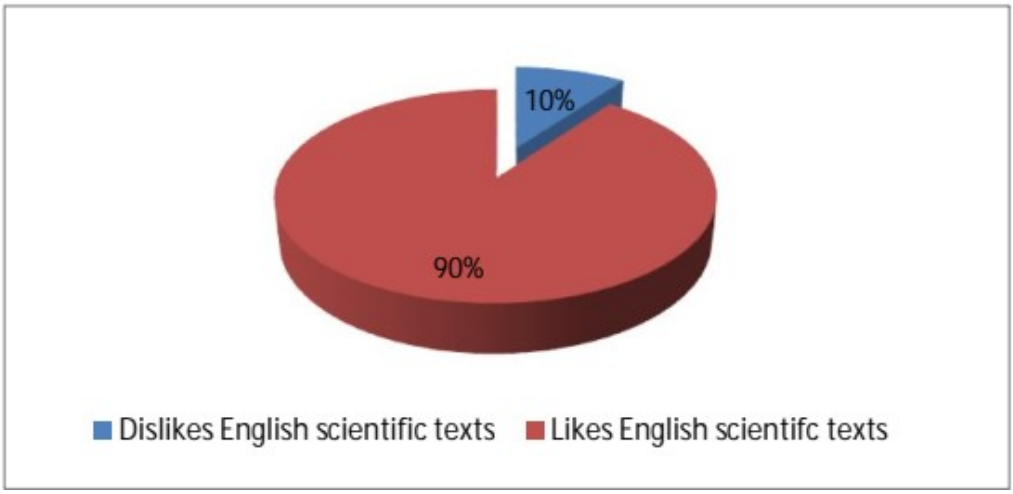

Figure 1: Students' Likes and Dislikes of Scientific Texts

It is apparent that a big number of students (90%) have got a positive attitude towards English scientific text's reading. This is due partly to its direct relation with their branch of study. This positive attitude should, normally, raise the students' motivation to study English in general. However, in our attendance with the class of the target group of students we noticed, as it will be depicted by the class observation tool later, that the majority of students did not show any motivation to study English, let alone reading English texts of scientific topics.

B- Favourite Science Study Branch

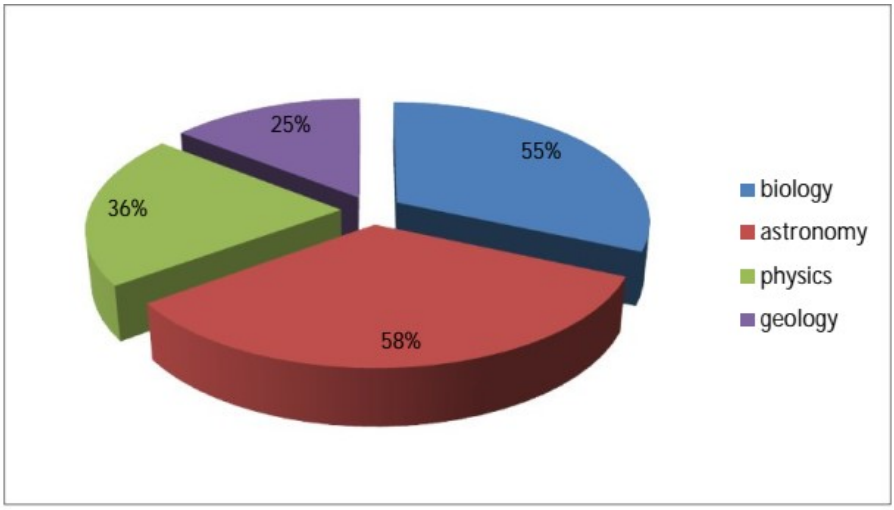

Figure 2 : Favourite Science Branch

First, with regard to the rates (%) mentioned in figure 2, it should be noted that some students have ticked more than one choice of branch of science. That is why one added to one another, the depicted rates give a result which is more than (100%).Next, the aim of this question is to know which branch of science makes the students more attracted to science and also raise their attention to some other existing branches of science .

According to the results in figure 2, an important number of students (58%) showed a more apparent interest to study astronomy. This can be explained by the fact that astronomy is the current encountered subject in the students' English textbook and hence they are predisposed to study it .

Biology ranked secondly after astronomy with regard to students' most favourite science branches when 55% of them showed their interest to

study it. This can be explained by the fact that biology is a dynamic subject which most students like to study and encountering it in English sessions will make it more motivating.

Compared to biology, more number of students (55%) showed a common interest to study astronomy while dealt with in English. Compared to astronomy and biology, less number of students (36%) does not seem to have interest to read English texts that deal With physics .This is also due to their basic weakness in physics .This is also due to their basic weakness in physics while dealt with as an independent subject. Thus , they have a psychological anxiety towards it. Just like physics, geology has not received great level of interest from the part of students(25%).This can be attributed to their lack of motivation towards geology while studied in science sessions.

In short, the students seem to hold a positive attitude towards reading English scientific texts in general especially when they cover topics which are closely related to their area of study which is science.

2- Reading scientific texts' strategies

A- Scientific Texts' Tough Features

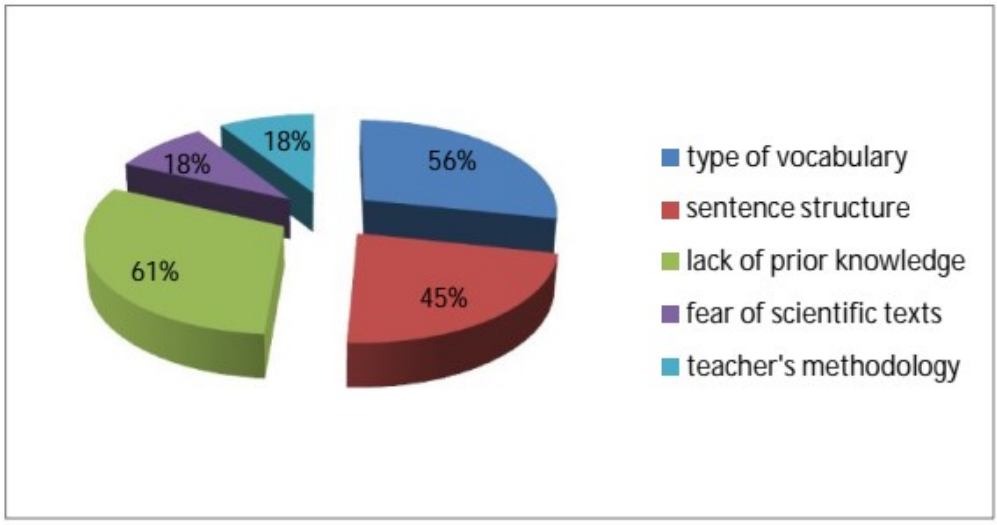

Figure 3: English Scientific Text Tough Features

As shown in figure3, the students' responses were distributed among three large slices that are attributed respectively to three types of difficulties that encounter students while reading English scientific texts. These are as follows: the lack of prior knowledge (61%), the type of vocabulary (56%) and the sentence structure (45%).With regard to the lack of prior knowledge, the students confirmed that having no prior information about the content of the text let alone its structure leads them to be caught in a state of ambiguity and confusion. Concerning the type of vocabulary, the students stated that the technical vocabulary encountered in English science texts presents one of the major difficulties that hinder their ability to understand such type of texts. This includes their weakness to identify both technical and the sub-technical vocabulary.

Besides, the students stated that one of their major problems to decode English scientific texts' meaning is owed to the sentence structure that characterises this type of texts. This includes mainly heavy loaded subjects and objects. With regard to the other two suggested obstacles which are the fear of scientific texts and the teacher's methodology, small number of students (18% for each suggested difficulty) said they these two difficulties create actual problems for them to read English scientific texts. The state of having no fear among a large body of students towards scientific texts is partly attributed to the fact that they have been already accustomed to such type of information in the other scientific disciplines related to their school subjects. With regard to the teacher's methodology, students at such a level and situation cannot really evaluate their teacher's methodology since they have not really trained on another alternative and a more effective reading method which can help them to judge the current teaching method.

B-Reading Strategies

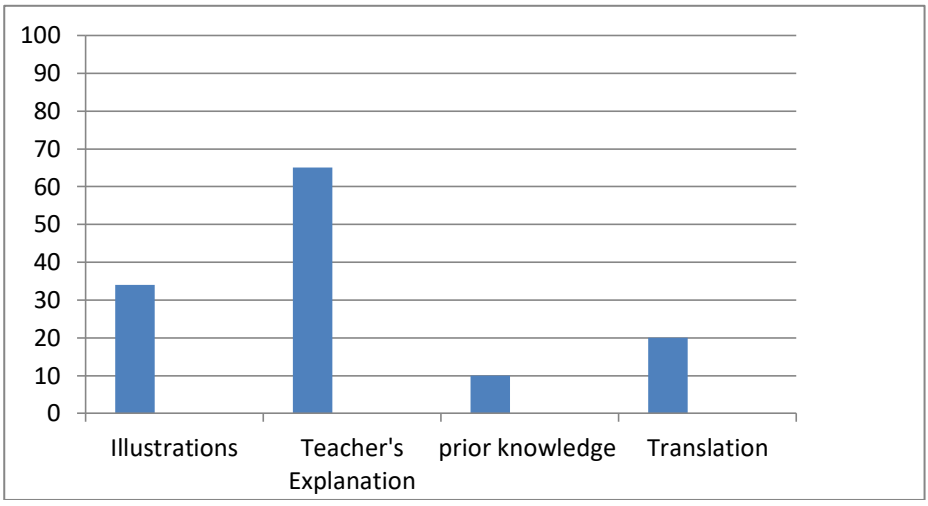

Figure 4 : Reading Strategies

It should be noted that some students crossed more than one option with regard to the reading strategies they often use in the process of scientific texts' reading. As depicted in figure 4, students rely much on the teacher's explanation to understand scientific texts being presented in class. Hence, it is the role of the teacher to seek other strategies to train students to be more autonomous learners. With regard to such reading autonomous learning strategies, students admit, though with less extent compared to their need to the teacher's support to understand the English scientific texts, that the incorporated illustrations would facilitate the task of approaching the ideas of the target scientific text. As expected, some students resort to translation as a strategy that would help them decode difficult scientific terms and vocabulary. Surprisingly, Few students state that they can make link with the presented texts and their prior knowledge in the reading process of the target scientific texts' analysis.

Conclusion

The results reveal that the students' attitude towards reading English scientific is positive and encouraging. As it has been depicted, a great deal of this positive admiration and acceptance to deal with such type of texts is related to varied factors. Among these factors we can state, for instance, the English language itself. That is to say, the students are very motivated to read scientific information whenever being encountered written in English. However, there are other obstacles that prevent students from having an easy access to understanding English scientific texts such as the lack of prior knowledge to scientific texts' content, their ignorance to the different scientific texts' structures and the difficult scientific lexis which incorporates technical and sub-technical vocabulary , the nominalisation process and the heavy loaded objects and subjects .It is the teacher's role to o attract the students' interests at a high degree to the English scientific texts' reading comprehension task through the use of authentic materials all in working in corporation with the teachers of scientific disciplines.

Hadley, J. (2006). Needs Analysis in ESP. in: English for specific Purposes in the Arab World (Lahlou, M S; Richardson, A), eds; TESOL Arabia. Dubai. 3-6.

Kennedy, Ch and Bolitho, R. (1990) English for Specific Purposes. Modern English Publications, McMillan Publishers Ltd.

McCormick, Thomas W. (1988): Theories of Reading in Dialogue: An Interdisciplinary Study. New York: University Press of America. P. 399. 0819171689. Location: Dallas SIL Library 372.4 M131

Robinson, P. (1980) ESP (English for Specific Purposes): The Present Position. Oxford: Pergamon Press

Strevens, P. (1980) Teaching English as an International Language: From Practice to Principle. Oxford: Pergamon Press.