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**An Investigation into Detecting Learners' Difficulties in Reading Comprehension in
English for Academic Purposes Context
The Case of Second Year Doctoral Students of Biology in the Natural and Life Sciences
Department at Biskra University**

Dissertation submitted in partial fulfillment of the requirements for a
Master Degree in Sciences of Language

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Declaration

I, Sabrina **LAMOURI**, do hereby declare that this dissertation is my own original work that has been compiled in my own words. This work has not been falsified or used for other courses and examinations. Nor has another person, university, or institution for another degree or diploma previously, or concurrently, published it, unless explicitly acknowledged (In-text citation and the list of references).

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Dedication

I dedicate my research work to my family and friends. A special feeling of gratitude to my beloved parents. Words can hardly describe my thanks and appreciation. I am truly grateful and honoured to have you as my parents.

To my brothers, sisters, and aunt thank you for your continued support and guidance.

To the memory of my beloved grandfather Zemouli, your presence in my life was a source of strength.

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Abstract

The current study aims to detect EAP learners' difficulties in reading comprehension. The study was conducted with second-year doctoral students of Biology in the Natural and Life Sciences department at Biskra University. Methodologically, in the present study, the interpretivist paradigm was associated with the qualitative approach. As for the research design, the researcher opted for a case study. To collect data, an unstructured questionnaire, and test were utilised. In order to analyse the collected data, descriptive methods were used. To carry out this research, a sample of 16 students was purposely selected to answer the questionnaire and proficiency test. It is worth mentioning that a needs analysis framework was applied to identify target group needs, lacks, and wants. Ultimately, the findings demonstrated that students struggle with poor comprehension of science texts written in English due to different factors. This study also revealed the students real need for improvement in specific English related to their field of study, biology studies. By the end of this investigation, the researcher provided some recommendations to meet target group expectations and to be a starter for future research to overcome the EAP difficulties of biology students.

Keywords: Biology, difficulties, ESP/ EAP learners', needs analysis, reading comprehension, poor comprehension, science texts.

List of Acronyms

NA	Needs Analysis
ESP	English for Specific Purposes
EAP	English for Academic Purposes
GE	General English
SE	Specific English
EOP	English for occupational purpose
EPP	English for Professional Purpose
EVP	English for Vocational Purpose
EBS	English for Biological Studies
RC	Reading comprehension
PSA	Present Situation Analysis
TSA	Target Situation Analysis
PNA	Pedagogical Needs Analysis
WW II	World War II
EFL	English as a Foreign Language
EGAP	English for General Academic Purposes
ESAP	English for Specific Academic Purposes
TALO	Text as Linguistic Object
TAVI	Text as a Vehicle of Information

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General Introduction

The global growth of English as a "Lingua Franca" inspires individuals all over the world to learn it. In the same vein, due to the obvious status of the English language, Ministers of Higher Education all over the world are strengthening it in practically all academic fields, and becoming increasingly conscious of its value. The necessity for a universal language and community linguistically mixed languages to communicate effectively with different groups is strongly appreciated by the international business communities.

The request for English courses tailored to specific requirements and addressed at a specific target group is increasing. In this respect, the use of English for specific purposes is largely concerned with learning. In precise terms, it focuses on how people learn the language and for what purpose they need English language. The present worldwide position of English has led to the creation of a language that is used as a means of study or work in practically all dimensions of life and academic disciplines such as science and technology, economics, and biological sciences.

More specifically, specific English (SE) is required in higher education, notably for those studying biological sciences. The latter demand linguistic knowledge for professional careers. In the same vein, reading comprehension is a vital component in developing proper linguistic knowledge, and it is ultimately related to their academic achievements. In point of fact, most science learners agree that science texts are challenging to read. This difficulty according to Hirvela(2012) "Reading texts and the treatment of vocabulary in ESP courses may in some ways be more challenging" p. 94. In the same line, Students' difficulties in understanding science texts may not be related to their reading skills, but rather to their incapacity to understand the nature of scientific discussion (Kurland, 1983).

1. Statement of the Problem

English for Specific Purposes (ESP) has been one of the most prominent disciplines in Applied Linguistics, in general, and in Teaching English as a Foreign Language (TEFL), specifically, since the 1960's. Regarding English for Specific Purposes, it emerged at the end of the Second World War, and it was not a planned and coherent movement, but rather a phenomenon that grew out of a number of converging trends (Hutchinson & Waters, 1987). ESP has functioned and operated in diverse ways around the world. Hutchinson and Waters identified three main reasons common to the emergence of all ESP. The demands of a brave new world, a revolution in linguistics, and a new focus on the learner of English for specialised purposes, which has various branches and requires a different form of English for each field in order to meet the demands of its students, differ from general English in many ways.

The concentration on the internalisation of structures and English usage is most noticeable in English contexts. According to Maley (2007), "ESP is the coal-face of international English: it is the practical application" (p.7). Keeping abreast of the latest scientific and technical breakthroughs, particularly for researchers, university lecturers, and students, necessitate increasingly specialised English knowledge of a more specialised nature. In other words, the popularity of the English language as a medium of worldwide communication is growing all the time. This is mirrored in a variety of disciplines, and sectors where English is used as a working tool. World countries, most notably Algeria, implemented English classes at all levels of the educational system to achieve clearly defined goals. Also, ESP and science are a unique mix because when we speak about science, we consider many of its subfields, involving their particular usage of English, such as the biological sciences.

The current level of English proficiency among university Biology students does not appear to meet international standards. Our view is based on preliminary discussion with the students. Despite the necessity of English for specific purposes in Algeria, particularly in Biology learners at Biskra University, and depending on the literature review phase, relatively, few research studies have been conducted to examine the learners' English language demands and deficiencies. The courses at Biskra University's Faculty of Biological Sciences, they said, had nothing to do with the demands of English usage and were more closely related to general English (GE) than English for Academic Purposes (EAP). They do not take into account their requirements and desires. Researchers claim that determining students' needs should come prior to designing an effective ESP syllabus (Hutchinson & Waters, 1987).

The present study is expected to both meet the needs of the target group and raise teachers' awareness of the importance of needs analysis. Also, it seeks to provide a product that can be of high importance gradually from general group (Course designers and ESP Practitioner's) to specific group (Students of Biology).

2. Research Questions

Based on the objectives of this study, this research seeks to answer the following research questions:

RQ1:What are the needs of Biological students?

RQ2: What are the main challenges faced by students of Biology while reading?

RQ3: How would students of Biology improve their English language?

3. Main Hypothesis of the Research

Based on the abovementioned research questions, we propose the following research hypotheses:

RH1: We hypothesise that since the students have most of their modules taught in French, their needs for English are not fully apparent, which lead us to assume that their needs are not taken into consideration. And there is a strong probability that French outweighs English in scientific domains of study in Algeria.

RH2: We hypothesise that the difficulties in reading skills are caused by different factors involving the following:

- some for having problems in language knowledge, which consist of grammar, vocabulary, and usage, and
- some due to difficulty of reading with comprehension.

RH3: If biology students specialised in English language through an appropriate and well-designed curriculum, they would get accurate results and be able to publish strong scientific articles and achieve global success. Therefore, reading comprehension that would assist them in comprehending the reading materials is needed.

4. Aim of the Research

The general aim of this investigation is to gain a better understanding of the trouble areas of second year Doctoral students of Biology at Mohamed Khider Biskra University in the academic year 2022-2023, regarding their reading comprehension difficulties, and to detect their exact needs regarding the purpose, especially when required to read materials in a foreign language when writing their dissertations.

More specifically, this research work seeks to:

- raise teachers' awareness of recognising their students' preferences and needs,
- design a suitable course,
- select activities and assignments when developing language courses and materials for students in order to motivate them because specialised English is highly needed in their professional career,
- examine the current ESP situation among doctoral students of biology, and
- help ESP practitioners to interpret these needs into language and pedagogic concepts of current significance to students and their future professional needs.

5. Research Methodology for this Study

Based on the nature of the research problem type, which is a description of a specific educational phenomenon, the raised questions, and the set out research aims of this study, it is ostensible that the nature of our research work is purely descriptive. Thus, because research is methodology, based on the available literature on the methodology selection for a research work, in the present investigation, we have opted for Creswell 's research methodology framework. Therefore, we will adopt a qualitative research approach and an interpretivitic paradigm for this research work since it provides a description of a specific educational phenomenon under investigation. Also, the researcher will opt for the Case Study design because it fits the researcher attempts to state an explanation of an existing issue.

Additionally, to gather the necessary data through a needs analysis questionnaire and proficiency testwere used. Our population consisted in the doctoral students at the Natural and Life Sciences Department. More specifically, the sample of the current study wascomposed of

Second-Year Students of Biology. Their number was 16. We selected the second-year students because they had already experienced reading scientific publications related to their field of study in English in their first year and are still facing difficulties in reading comprehension in their second year. As for the sampling technique we utilised the purposive sampling, which is a non-probability sampling method.

6. Choice of the Writing Style

In this research work we opted for the American Psychological Association 7th edition Writing Style because of its suitability to our field of study, that is Social Sciences. However, an exception has been made regarding the 'Justify' function. The latter was decided on after an agreement between the supervisee and supervisor.

7. Significance of the Research

The significance of this study is emphasised since it sheds light on both teachers' performance and students' wants and requirements. Students majoring in Biology, in particular, need to learn and enhance their English language skills in order to meet certain academic potential. As a consequence, they must be equipped with this challenging academic competence. English for Biology studies courses are restricted. Few works have addressed the issues encountered by Biology students, notably in Algeria, in general, and Biskra University, in particular. Accordingly, this study seeks to increase students' awareness of the value of the English language, and its official position, particularly English for Biology. This awareness primarily motivates students to participate powerfully in the learning process.

The present research may contribute to the developing issues in ESP and EAP by giving a clear description of the target situation under investigation. This study may also be valuable work for the Ministry of higher education and scientific research in establishing an

appropriate syllabus for PhD students of Biology by focusing on the main criteria addressed in an authentic manner all along the research, in order to enhance the scientific research rate and increase the number of scientific publications. Thus, this is one of our goals that we believe it converges with the Ministry of Higher Education and Scientific Research goalsexpectation in the present time.

8. Structure of the Dissertation

The current inquiry focuses on the study's context. It sheds light on the researchs' fundamental problem and determines the research's questions that this study attempts to answer, the main objective of performing this research, its hypothesis, significance, and the study's systematic organisation. The dissertation is made up of into four chapters.

Chapter One

Attempts to present theoretical accounts of English for Specific Purposes, review the major fundamentals and consideration in order to display the status of English for Biology. It also seeks to provide background issues in the area of ESP, its definitions and origins, the categorisation of the areas of ESP teaching, EAP, EOP, and its relationship to ESP. It provides a brief review of the literature relevant to English for Specific Purposes (ESP). In addition, it presents needs analysis, which is viewed as the core of the ESP area.

ChapterTwo

Strives to provide definitions of reading comprehension, and its cognitive processes, in addition to, different difficulties of ESP students regarding reading science texts in the academic setting, and some solutions to these obstacles.

Chapter Three

Seeks to clarify the research methodology selected for this research work. In addition, it provides a justification of the rationale behind choosing a specific paradigm, design, or approach, as it allows the readers of this study to understand the methodology selected for the present investigation.

Chapter Four

Is devoted to the discussions and interpretation of the data and the presentation of the findings, in addition to, the general conclusion, pedagogical implications, and the study limitations.

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Introduction

The present chapter provides a brief review of the literature relevant to English for Specific Purposes (ESP). It attempts to identify the origins and genesis of ESP and, introduces different definitions of 'ESP', as well as its distinctive features and areas. Additionally, an important aspect of ESP, and how it relates to language skills are going to be presented. In addition, linguistic needs analysis, which is thought of as the core of the ESP area, as well as its various forms and methodologies will also be discussed.

1.1 Origins and Genesis of English For Specific Purposes

The area of English for Specific Purposes was established in the 1960s. At the end of the decade, the study of language usage rather than language form grew stronger and materials development gained popularity. The emphasis on language proficiency and booming research were both consolidated during the 1970s and 1980s.

The foundations of English for specific Purposes (ESP) can be connected to the end of the World War II. Many perceived the necessity to study English, which was regarded as the accepted international language, in the new commerce-driven world. It was viewed by non-native speakers as the new universal language that met their needs for intercultural communication. Hutchinson and Waters (1987) identified three main reasons common to the emergence of all ESP. First, the demands of a brave new world, in which there were an increase in economic, scientific, and technological development on a global scale. The latter are dominant forces that created both, a unified world that needs English for business doing and international communication, and a new generation of learners who knew specifically why they need English.

This development is due to oil crises of the early 1970s, which has given English language a high status as a lingua franca for international relations. The second reason that contributed significantly to the emergence of ESP was a revolution in linguistics. As the need for English classes that were specifically targeted to student needs increased, significant new ideas in language study also started to emerge. It shifted the focus away from grammar rules and other formal language aspects towards language use in particular contexts and fields.

The final reason mentioned by Hutchinson and waters (1987) is the focus on the learner. The evolution of ESP has also been aided by the new developments in Educational Psychology. Therefore, the basic principle in ESP is the focus on the learners' needs and hence designing specific courses that meet the targeted goals, in other word, the focus of teaching has shifted from language- centred approach to learner- centred approach to teaching.

1.2 Definitions to English for specific purposes

Nearly, as many academics have attempted to define ESP as there are definitions of the term. ESP is an acronym that stands for English for Specific Purposes. It is an approach to language teaching and learning. Robinson (1980) stated that " definitions of ESP are numerous" (p.3).According to Hutchinson and Waters (1987), ESP is "An approach to language teaching in which all decisions as to content and methods are based on the learner's reason for learning"(p. 19). This makes it clear that the "what" and "how" of the course will depend on the requirements and goals of the learner.

Mackay and Mountford (1978) added ESP as the teaching of English for a "clearly utilitarian purpose"(p.2). This means that English should indeed be taught so that learners can specialise in one specific language skill through the use of authentic scenarios, in a way that

will enable them to utilise English in their future careers or to understand English discourse relevant to their area of expertise.

According to Harmer (1983), " ESP is situations where the learner has some specific reasons to learn a language i.e. learners want to learn the target language to fulfill specific reasons which can be academic or occupational" (p.1). This implies that ESP courses are targeted at a particular group whose demands and goals are similar for employment and academic purposes. This author defined it in terms of "situations" because each learner's situation is unique in terms of their goals, needs, and reasons for joining in ESP courses. For Paltridge and Starfield (2013), "ESP refers to the teaching and learning of English as a second or foreign language where the goal of the learners is to use English in a particular domain" (p.2).

In short, referring to the set of definitions cited above, it is ostensible to draw the inference that the majority of academics share a point on the core principle of ESP, which is specific in nature and primarily concerned with understanding the needs, identifying the lacks, and defining the goals of a specific group.

1.3 Characteristics of ESP

Dudley-Evans and St. Johns (1998) defined ESP by suggesting two types of characteristics: Absolute characteristics, as well as Variable Characteristics. In the following, a short description of these characteristics is going to be presented:

1.3.1 *Absolute Characteristics*

- ESP is defined to meet specific needs of the learners;
 - ESP makes use of underlying methodology and activities of the discipline it serves;
- and

- ESP is centred on the language (grammar, lexis, register), skills, discourse and genre appropriate to these activities.

1.3.2 Variable Characteristics

- ESP may be related to or designed for specific disciplines;
- ESP may use, in specific teaching situations, a different methodology from that of General English;
- ESP is likely to be designed for adult learners, either at a tertiary level institution or in a professional work situation. It could, however, be for learners at secondary school level;
- ESP is generally designed for intermediate or advanced students. Most ESP courses assume some basic knowledge of the language systems, but it can be used with beginners. (Dudley-Evans & St. John, 1998. P.4)

The absolute characteristics are unique to ESP, since the needs of the learner are of primary significance when generating language excercises. On the other side, the variable features allow ESP courses to be tailored for a particular audience and allow all the learners' categories and fields to be benefited by ESP. Due of this explanation, Dudley-Evans and St. John considered ESP to be an "attitude of mind."

Based on these fixed and variable characteristics, students of Biology can study English in a version of language intended for particular purposes since they meet the requirements for the discipline's specialism.

1.4 Branches of ESP

ESP is divided into two main branches. English for academic purposes (EAP), the latter usually is associated with exploring and teaching the English usually needed by

individuals who use the language for educational reasons. EAP can be classified into two categories: English for Specific Academic Purposes (ESAP), and English for General Academic Purposes (EGAP). This field emerged from the broader field of English for specific purposes (ESP), and has managed to grow enormously in importance over the last two decades. It was driven by global growth in the use of English for employment and scientific research (Paltridge and Starfield, 2013). In the same vain, Anthony (2018) asserted that:

Perhaps the most influential branch of ESP is English for Academic Purposes (EAP), which focuses on ESP in academic settings. Many ESP journals, such as English for Specific Purposes, are heavily weighted in favor of EAP topics, and there is even a dedicated journal devoted to EAP work called the Journal of English for Academic Purposes. The huge attention that EAP receives in the field of ESP is not surprising when you consider that many ESP researchers are based in academic institutions and many second and foreign language learners have a strong need for EAP skills in order to complete their school and university studies. (p.13)

As for English for occupational purposes (EOP), which is necessary for individuals to carry out activities related to the English language in the real world of work, learners are expected to be prepared for professional situations in the classroom. Anthony (2018) demonstrated that the two categories of EOP are (1) English for Professional Purposes (EPP) and (2) English for Vocational Purposes (EVP). Of course, even more division of these sub-branches could result in a more concise set of sub-branches. Both major branches of ESP are represented in figure 1.

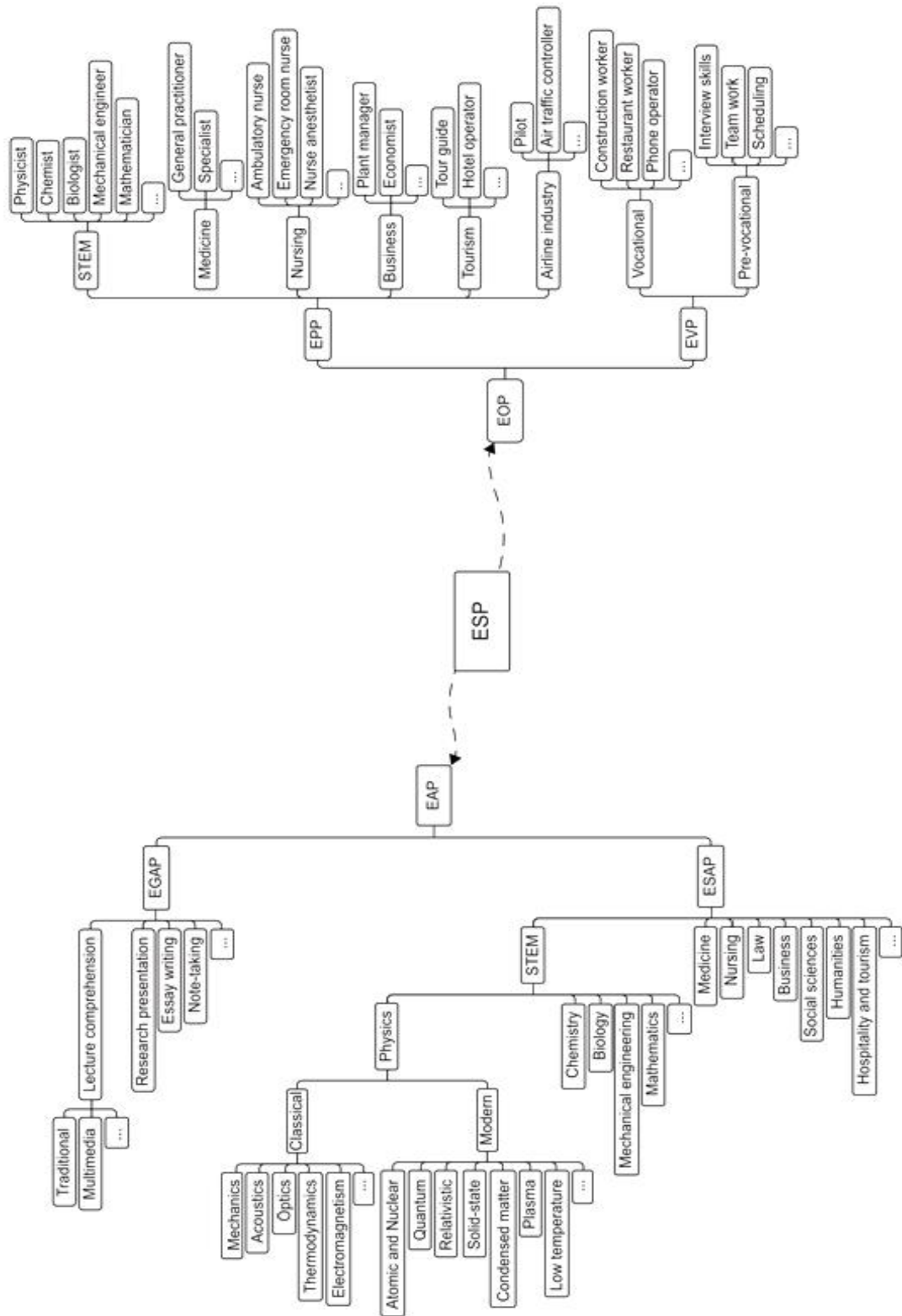


Figure 1: Some of branches and sub-branches of ESP (Anthony, 2018).

1.5 English for academic purposes

English for Academic Purposes (EAP) is a discipline of Applied Linguistics that includes a considerable amount of research into effective teaching and assessment, description of the linguistic and discursive structures of academic texts, and analysis of academic textual practices. EAP originated in the 1980s from the fringes of the English for Specific Purposes (ESP) movement to develop into a powerful factor in English language teaching and research. EAP has desired to demonstrate some of the limitations of academic contexts on language use and to develop ways for learners to gain control over these, drawing on broad core concepts, a commitment to research-based language education, and the subject-matter expertise of its students (Hyland & philip, 2016).

Furthermore, they are a diverse group that contains not only the traditional EAP constituency of undergraduates planning to study English as an additional language (EAL), but also secondary and primary students, as well as academics writing for publication or presenting papers at conferences (Hyland & philip, 2016). That being said, EAP is considered as a sub-division of ESP, that is concerned with developing academic courses to the target group with paying a great attention to their academic and professional needs. its interested with enhancing academics language skills regarding the purpose of building their careers.

Among the skills to be developed for university learners is reading with comprehension of scientific texts that are known by the difficulty of interpretation and discussion. Learner's difficulties in understanding science texts may not be related to their reading skills, but rather to their incapacity to understand the nature of scientific discussion (Kurland, 1983). As far as this inquiry is concerned, and based on the ESP teaching areas, English for Biological Studies (EBS) can be classified as a branch of English for Academic

Purposes (EAP), a sub branch of English for Specific Academic Purposes (ESAP). The table below illustrates this.

Table 1

Areas of ESP Teaching (Basturkmen, 2006)

Branch	Sub branches	Examples
English for Academic Purposes (EAP)	<ul style="list-style-type: none"> English for General Academic Purposes (EGAP) 	<ul style="list-style-type: none"> English for academic writing
	<ul style="list-style-type: none"> English for Specific Academic Purposes (ESAP) 	<ul style="list-style-type: none"> English for law studies English for Biology studies
English for Professional Purposes (EPP)	<ul style="list-style-type: none"> English for General Professional Purposes (EGPP) 	<ul style="list-style-type: none"> English for the health care sector
	<ul style="list-style-type: none"> English for Specific Professional Purposes (ESPP) 	<ul style="list-style-type: none"> English for nursing
English for Occupational Purposes (EOP)	<ul style="list-style-type: none"> English for General Occupational Purposes (EGOP) 	<ul style="list-style-type: none"> English for the hospitality Industry
	<ul style="list-style-type: none"> English for Specific Occupational Purposes (ESOP) 	<ul style="list-style-type: none"> English for hotel receptionists

1.6 Specific Vs General Academic Purposes (EGAP Vs ESAP)

Specificity, or the distinction between what has been referred to as English for General Academic Purposes (EGAP) and English for Specific Academic Purposes (ESAP), is a major concern with how we perceive and use EAP. Following an EGAP, teachers choose an EGAP method to determine the knowledge, capacities, and various techniques that are assumed to be shared by all disciplines. On the contrary side, ESAP reflects the notion that, while certain generalisations can be drawn, it is possible that the variances between these abilities and customs across other fields outweigh the similarities. ESAP thus focuses on the teaching of language and abilities appropriate to the requirements of a specific subject or department (Hyland, 2006). This implies that ESAP stresses on teaching a specific subject to its target audience while highlighting the technical vocabulary and abilities that must be learnt in order to use the language in a certain area. However, EGAP aims to teach semi-technical terminology and abilities that teachers believe are applicable across all fields.

6.1 Reasons for General EAP

It is claimed that language teachers are untrained, unqualified, and unconfident to teach in subject-specific conventions. EAP is also thought to be simply too challenging for learners with inadequate English competence. Language tailored to a certain field is not appropriate for weaker students. Additionally, teaching subject-specific skills reduces the position of EAP as a service by supporting academic departments only as opposed to building its own independent topic knowledge and competencies (Hyland, 2006).

Additionally, there are generic skills that supposedly change relatively little across specialties. These include taking notes from lectures and printed texts, skimming and scanning documents for information, paraphrasing and summarising arguments, doing library and Internet searches for relevant books and ideas, giving oral presentations, participating in

seminars and tutorials, and so on (Hyland, 2006). This demonstrates that teachers may opt for English for general academic purposes due to certain reasons that they need to obtain successful and adequate training to learners.

6.2 Reasons for Specific EAP

What exactly learners are learning is a question that is raised by the discussion of general skills and language. Professionals in the EAP are concerned with more than just teaching individual words, structures, lexical phrases, and so forth. The verbal practices that, because of their reliability and significance to the communities in which they are used, convey obvious disciplinary values. Only by familiarity with the actual communicative procedures of specific fields can one become aware of such associations.

Additionally, EAP sessions offer a variety of subject-specific communicative skills in addition to concentrating on forms. Few EAP teachers would want to defer training in such concepts because participation in these activities rarely requires on learners' complete mastery of "Common Core" grammar elements (Hyland, 2006). This implies that English for specific academic purposes are chosen due to certain reasons that are supposed to be taken into account. In the mean time, teachers are expected focus on specific skills that target group needs in their specific domain.

1.7 English and Science

Science is a significant candidate to support the expansion of the English language. Therefore, it is essential to have a language universally accessible to communicate and develop science. This is the rationale for English's remarkable spread across all scientific disciplines; English today plays a comparable position what Latin did in the Middle Ages, a role that remained until the appearance of the modern period (Siguan, 2001). In the same

vein, it was claimed by Drubin and Kellogg (2012) that only English was currently regarded as the language of science. And given that English is used as the common scientific language, people who are not native speakers of English (NSE) face particular difficulties, thus native English speakers should be considerate and cooperative while evaluating or editing non-native speakers' work. Beyond grammatical, syntactic, and usage mistakes, editors should consider the science.

Additionally, it is improper to reject or strongly criticise the works of non-native speakers because of grammatical issues. It is crucial that non-native English speakers understand that their capacity to contribute to the global scientific effort is closely correlated with their capacity to produce works in English that are concise, clear, logical, and easy to understand, to eventually be approved for publishing. In this sense, Di Bitetti and Ferreras (2016) noted that the publications published in English had more citations than those published in other languages, indicating that the latter practice is for getting academic works generally known. Universities and scientific institutions should be aware of this situation, raise awareness of it, and improve the teaching of English, especially in the natural sciences.

This may be the result of English articles being more widely accessible. Thus, it appears that the only choice left to researchers who want to share their findings with the entire scientific community is to write and publish their works in English. That is to say, "publish in English or perish" would be a good option for non-native English speakers, particularly for doctoral students in which their main mission is to write works and articles for publication.

1.8 Difficulties in EAP

There is a plethora of issues that make it difficult for learners to acquire general and specific English in the academic context, especially in the scientific disciplines as Biology. This is mainly due to the fact that students in technical fields in higher education institutions

and universities do not view English as a means of communication and instruction, and individuals are unaware of its importance. Furthermore, Algerian students acquire general English that is unrelated to their field of study as a subject, which weakens their background in English.

Moreover, the French language dominates Algerian science domains. Since French language is the primary language used for instruction and learning during the license and master's degrees, our sample's biology students in particular struggle because they place a greater emphasis on French than English, which has caused them to lose interest in and underestimate the value of the English language. Learners get to the PhD level, where scientific publications that are written in English are widely read and communicated, learners start to second-guess it and search for specific biology expertise, or English for biology purposes, to get over the obstacles. In light of this, the issue of Biology PhD learners' needs is raised. According to Khan (2017), because of the specialised terminology used in the field of study, learners in the medical and biological sciences experience particular problems in English. Even though it is a foreign language, English is challenging. In the same vein, Iswati and Triastuti (2021) believed that with the rising practice of teaching English for Specific Purposes (ESP) in non-English higher education departments, exploring the difficulties faced by ESP teachers is extremely important. These challenges could be the result of ESP courses being taught by teachers who speak English well but complete absence knowledge about a specific subject of study.

More specifically, Lack of understanding of the learners' discipline reveals that their different academic backgrounds make it difficult for them to begin studying an unfamiliar subject of study, and though knowledge is mostly referred to as terminology or vocabulary of the given field. As a result, inadequate subject knowledge can also make teachers think

negatively, which eventually affects the environment of teaching and learning. Teachers' lack of confidence and anxiety will not be beneficial to effective teaching and exacerbated the students difficulties. Another difficulty can be results from ESP teachers that are frequently pick the curriculum and teach materials they want to use regardless of their institutions. Thus, without conducting a needs analysis, teachers create the content and teaching materials without taking into account information previously gathered that reflects the specific wants and needs of the university and its students (Iswati & Triastuti, 2021), which indicates that the lack of needs analysis leads to many challenges. Teachers should be aware of this process to make sense of learning and teach what students exactly needs for saving time, efforts, and enhancing students performance in their academic and professional careers. That is why training ESP teachers essential because they should with enough knowledge of the directly relevant subject matter as well as to improve their knowledge and awareness of instructional approach.

Iswati and Triastuti (2021) highlighted this difficulties and suggestions to overcome them in order to persuade ESP decision makers and ESP practitioners in higher education's non-English departments to give ESP practice more serious consideration and to improve it. The latter goal is similar to our objective.

When it comes to Biology, both science and English are equally crucial. At Biskra University, Biology PhD students are required to write works in English. The fundamental issue is the lack of necessary language skills that results from the absence of needs analysis process, and teachers educational background is different from the field of students, and this what pushes the researcher to inquire about the difficulties faced by Biological students and how Biology PhD students may enhance their background and improve their English language.

1.9 ESP and the language skills

In the ESP context, according to target group needs and interests, language skills are taught. The common ones are explained below.

1.9.1 The Listening Skill

In academic listening, where more studies have been done in recent years. ESL listening in general and listening for particular reasons share many basic features. While having specific subject- or domain-specific knowledge is helpful for ESP listening, a learner's overall ESP listening performance would be more affected by their general proficiency in listening in the target language (ESL listening competency). According to Goh (2013), learners who need ESP instruction already have a degree of language ability that enables them to communicate in English, which is one of the reasons for the observed differences between ESP and ESL listening.

As a result, Learning materials for these learners therefore tend to focus on developing the specific vocabulary of the field of work or study. In higher institutions, academic listening training often aims to assist students build abilities like lecture comprehension that will enable them to participate and participate in academic or academic-related discourse. Therefore, it is crucial that EAP students possess high listening comprehension and retention in order to both hear lectures and engage in face-to-face contact with others. Learners of second/ foreign languages can improve their listening comprehension and memory by using their understanding of genre structure, understanding how tense and element are expressed in the English language will also enable listeners in developing their syntactic understanding Goh (2013).

Also, vocabulary, known as lexical knowledge, is another source of information for comprehension and it entails understanding not only the words' literal meanings but also various semantic references of the same words when they are used in various contexts. Even among advanced students, vocabulary has been demonstrated to have a significant impact on the results of L2 comprehension. For ESP listeners, vocabulary remains a difficulty because each subject has a unique set of technical and specialised terminology that must be learnt in addition, even when a student has met certain words and is familiar with their meanings, they could still struggle to pick them out in a stream of speech. This implies that the listening skill is integrated with the other language skills and language levels.

1.9.2 The Speaking Skill

In some ESP situations, particularly English for Academic Purposes (EAP), written genres have been seen as more crucial to career success than oral ones. However, given the current ESP research landscape, information can be gathered with a handheld audio/video recorder or even an off-the-shelf smartphone in practically any speaking situation. Conference presentations (CP) are unquestionably necessary for academics to actively engage in the continuing work of their specialties. Early ESP speaking research mostly focused on conference papers and posters (Feak, 2013.p.46-55). Supraba et al (2020) stated that reading can be a great technique for learners to increase their speaking skill and their oral English.

Reading aloud enables students to actively practice their pronunciation while also developing their speaking skills. This makes the connection between the two skills clear. There is no denying, according to Mart (2012), learners who enhance their reading vocabularies also tend to broaden their speaking vocabularies. Indeed, vocabulary knowledge, which facilitates communication, is a crucial component of reading comprehension. Additionally, well-spoken students are more likely to read a lot. Students in

technical disciplines where English is taught would have to be aware of the benefits of reading and how it relates to other skills, including speaking skills. According to Mart (2012), reading helps students strengthen their speaking fluency and expressions accuracy. Being able to speak, express, or exchange ideas through language is what is meant by having speaking skill. According to Nunan (2003), " speaking is a productive aural/oral skill and it consists of producing systematic verbal utterances to convey meaning" (p. 48).

1.9.3The Reading Skill

Reading stands in what may be described as a distinct position in English for specific purposes (ESP). Most of what ESP students do relies around reading, both to learn about the discourse of the target community, and in conjunction with the use of another skill, as writing. It will therefore come as no surprise to most individuals in higher institutions and universities to understand that in terms of ESP reading is the most important skill according to McDonough (1984, p. 70). Thus, the growth of reading in ESP is related to significant changes in ESP.

According to Hutchinson and Waters (1987), whereas the first phase of ESP's development concentrated on language at the sentence level, the second phase saw ESP strongly associated with the newly emerging field of discourse or rhetorical analysis, shifting focus to the level above the sentence. This shift in emphasis made space for alternative and new reading strategies. Dudley-Evans and St. John (1998) highlighted this changing position in their remark that reading was increasingly being taught from the perspective of texts as transmitting content rather than having simply linguistic features. As a result, the ESP readers have to develop their ability to recognize and extract essential information from the text (text as a vehicle).

Reading then, was regarded as a situated activity in ESP, which placed an emphasis on authentic texts taken from different academic or professional communities and examined their features as forms of discourse. While learners in ESP courses may still learn a set of fundamental reading comprehension skills that are useful in a variety of reading contexts, there is a growing focus on connecting reading instruction to particular rhetorical and communicative contexts, with different reading requirements in each. ESP reading specialists place a high priority on what students have to read and comprehend in addition to how they should read. Since reading begins with the words on the page, vocabulary plays a significant role in both native language and second/foreign language reading study.

However, the treatment of vocabulary in ESP classes may present some challenges beyond those presented in general purpose English courses due to the nature of reading specialised materials, particularly their technical vocabulary. Reading is viewed as a complement to other language skills as writing. While there has been significant progress in the area of reading as a stand-alone skill, many ESP specialists have shown a great deal of interest in an integrated skills approach where reading is considered as a stepping stone to other skills or as a complement to them Hirvela (2012). A vivid example of the integration of reading and writing skills can be seen in our study, where PhD Biology students are required to read English-language publications relevant to their field of study before writing and producing their own academic works to further their careers.

1.9.4 The Writing Skill

Due to the remarkable development of the English language that the world is witnessing, this language has become the most widely used language. This development has also reached the scientific side, as writing in English has become a need for university learners in particular, to publish their work on a large scale. In the same vein, the success of

this learners in higher institutions depends primarily on their ability to write in English and follow the correct writing conventions.

Hyland (2013) stated that the most important activity in institutions is writing. Writing in English is of highest concern to students in higher education and on professional training courses because it continues to rule as the worldwide language of enterprise and scholarship. Many learners now need to become accurate in English writing conventions in order to comprehend their fields of study, start their jobs, or effectively complete their education. ESP framework of writing places a strong emphasis on helping students become proficient in specific target genres. Teachers do not just "teach writing," but rather specific types of writing that are seen closely and required in some academic or professional settings.

According to our sample, PhD Biology students at Biskra university focus on and require specific writing genres, such as articles and abstracts, that are practical in both their academic and professional contexts.

In ESP writing research, although there are several strategies for studying texts, genre analysis has emerged as the most popular and fruitful approach. In order to understand how writing truly functions as communication, a genre approach to writing looks just below the surface structures of texts as products and looks beyond the struggles of writers to create meanings. This approach considers that texts are always a reaction to a certain communicative situation and seeks to understand the linguistic forms used in writings for specific purposes and functions. The patterns a text takes are regarded as resources used to fulfill the writer's objectives, relationships with his or her readers, and information that needs to be conveyed (Hyland, 2016).

According to Hyland, the term "genres" serves as a reminder that when individuals write, typically organise their messages according to norms in order for the readers to

understand the goals and because we all have a range of linguistic options at our storage to communicate in different contexts. Texts and assignments are thus genres are clearly modeled and chosen according on the goals of the learners to give them something to aim towards and that is relevant to their disciplines.

1.9.5 Vocabulary

Reading for academic purposes during university study can expose readers to millions of running words per year. The nature of words encountered while reading is a central focus of academic and disciplinary language research. Reading for gaining more new vocabulary is important for writing for EAP, especially since writing is the most common form of assessment at the higher institutions. Vocabulary in English for Academic Purposes (EAP) is a rich and rapidly expanding field that is rapidly expanding beyond the historical areas of English as a first language contexts and English as a second or foreign language settings (Coxhead, 2016).

Acquiring academic and disciplinary vocabulary is an important task for EAP learners of both first and second language. Krashen (1981) confirmed that those who read more, have larger vocabularies, do better on test of grammar and write better. This task entails learning to recognise and apply vocabulary that is closely related to the content of a specific field of study (Coxhead, 2016. p.177). In the last few decades, academic vocabulary has been classified in a variety of ways in the literature. It is divided into two sections: English for general academic purposes (EGAP) and English for specific academic purposes (ESAP). Academic vocabulary can be thought of as a component of vocabulary that appears in a variety of academic subject areas, such as biology. Disciplinary vocabulary is often referred to as specialised, technical, semi-technical, or sub-technical. Thus, in EAP studies, disciplinary vocabulary relates to specific areas of study within a university.

1.10 Needs Analysis

Needs analysis, or needs assessment, is a crucial step in developing and implementing any language course. For Basturkman (2010), ESP courses aim to teach specific groups of language learners the language and communication skills they will need to function effectively in their fields of study, professions, or workplaces. Because ESP concentrates on learning specific communication and language skills, the course developers of an ESP course usually include a stage in which they identify what specific language and skills the group of language learners will needs. The identification of language and skills is used in developing and refining the ESP course content. It can also be used to evaluate students and their learning at the end of a course. This is known as a 'needs analysis' process. The latter shows that needs analysis is an initial step in designing any ESP syllabus in which it reveals the needs of the specific group in language skills to enhance and raise their performance, and to make the target group capable of carrying out their careers and academic interests successfully. This enable teachers to evaluate their learners language level.

In parallel to Hutchinson and Waters (1987) definition, which demonstrated that the ability to recognise a need rather than simply having a need differentiates ESP from general English. Learners and teachers should be aware of the reasons why students need English, this will affect what will be considered appropriate as reasonable content in the language course and, on the bright side, what potential can be utilised. As a result, despite the fact that the content of the ESP course such as courses on biology, medicine, and science might at first view seem to define it, this is actually simply a result of the core objective of being capable to clearly define why the students need English.

In a simply put, the awareness of a need is what separates the ESP from the general English, not the nature of the need. This being said, they certainly continue to support the idea

that any course should be developed using an analysis of learner needs. They clearly stated that needs analysis is a cyclical process that can be started before the course is planned and it provides insights into the ongoing assessment and evaluation of the needs of the students. In the same vein, Hyland (2006) asserted that

" Needs analysis refers to the techniques for collecting and assessing information relevant to course design: it is the means of establishing the how and what of a course. It is a continuous process, since we modify our teaching as we come to learn more about our students, and in this way it actually shades into evaluation the means of establishing the effectiveness of a course" (p. 73)

This signifies that NA is a powerful strategy for language teachers to implement in order to assess the special needs, interests, and priorities of the learners when it comes to language learning. Additionally, it helps the course designers detect the students' weaknesses in the areas of reading, speaking, listening, and writing that need to be strengthened. This process is continuous because teachers adapt their instruction in response to it and become more conscious of the specific needs of their students. NA is conducted in this research among Biology PhD students in their second year, mainly on the language skills to detect their lacks, wants and necessities and to see what is the needed skill to be improved, and they put among top priorities. This is primarily what leads the researcher to question about the needs of this specific group of students.

1.11 Types of Needs

Needs analysis is regarded as the cornerstone of ESP in which researchers, and ESP practitioners are expected to obtain and analyse data of a particular group using different tools in order to detect their priorities, interests, potential for the future, and prior experiences to be taken into account to shape a more accurate list of needs to focus on when choosing materials,

and evaluating language. Hutchinson and waters (1987) proposed a classification of needs that contains two types of needs: target needs and learning needs, as illustrated in the diagramme below.

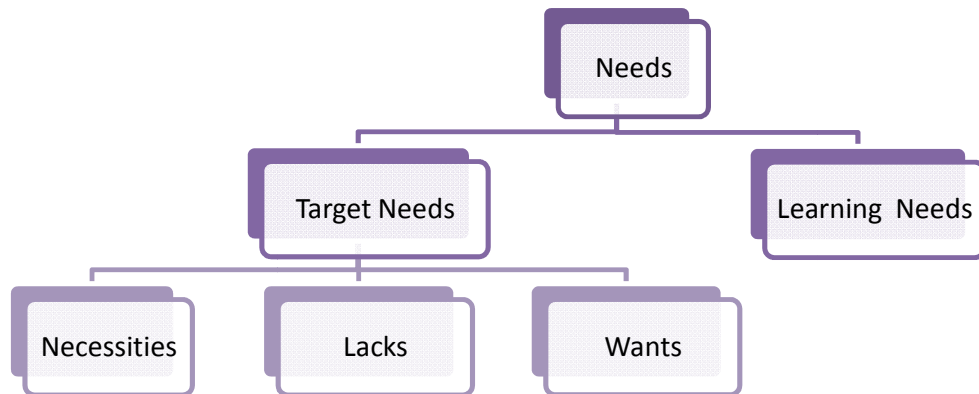


Figure 2. Hutchinson and waters' classification of needs (1987)

1. 11. 1 Target needs

What the learner is required to perform in the target situation is referred to as the target need. Bloor (1986) defined target needs as:

a need analysis which may be target-centred, that it looks at the learners' future role(s) and attempts to specify what language skills or linguistic knowledge the learner needs in order to perform the role(s) adequately (p.16).

According to Hutchinson and Waters (1987), "target needs" seemed like an umbrella term that, in practice, hides a number of key distinctions. It is more crucial to consider the target situation in terms of necessities, lacks, and wants.

1. 11. 1. 1 NecessitiesThe requirements of the target setting determines what the learner must know in order to perform well in that target environment. Necessities are a specific type of need identified by certain demands. Hutchinson and Waters (1987) confirmed

that, there are some linguistic aspects that he or she needs to be aware with, such as discorsal, functional, structural, and lexical, that are commonly required in the context in order to perform effectively in it. In EAP context like that in the Natural and Life sciences Department, students need to understand and be proficient at reading publications written in English.

1.11.1.2 Lacks The learner's lacks are defined as the gap between the desired competency and the learners' current proficiency. Since the focus of ESP is on the needs of specific students, Hutchinson and Waters (1979) claimed that simply recognising necessities is insufficient. The researcher must also be aware of what the learner already understands in order to determine which needs are still lacking.

1.11.1.3 Wants Wants are the learners' awareness of their specific needs, or more particularly, what the learners personally want the course to offer them. As a consequence, in the needs analysis process, taking into account the learners' expectations from the course is extremely important and cannot be neglected in the development of ESP courses.

1.11.2 Learning Needs ESP course is seen as a journey. By considering the starting point (lacks) and the distination (necessities), and what that distination should be (wants), what is still not considered in this journey is the route to get from the starting point to the distination, which indicates another type of needs, namely learning needs. It is what learners need to do in order to perform well in the academic or occupational context. Hutchinson and Waters (1987) stated that:

"The whole ESP process is concerned not with knowing or doing, but with learning. It is naive to think that a journey can be planned solely in terms of the starting point and the distination. The needs, potential and constraints of the route (i.e.

the learning situation) must also be taken into account, if we are going to have any useful analysis of learner needs"(p. 60).

That being said that in the learning needs, background, and learning environment should all be considered in order to produce an analysis that is both accurate and thorough for the learner. Some of the questions in the framework that need to be addressed for a proper analysis of learning needs are about, who are the learners, their learning backgrounds, what they already know about English, what teaching methods are likely to bore or alienate them, whether or not there is an apparent need, and what subject knowledge they have.

1. 12 Approaches to Needs Analysis

The most important criterion in the field of study of English for specific purpose is needs analysis. The accurate needs analysis that is held for various purposes is conducted using a variety of approaches, including present-situation analysis, means analysis, and target-situation analysis.

1.12.1 Present-Situation Analysis

The term Present Situation Analysis (PSA) was first used by Richterich and Chancerel (1980).The phrase "starting where the students are" refers to a present situation analysis that considers the learners' current proficiencies and goals, as well as their abilities and perspectives, familiarity with the specialty subject, and knowledge of its requirements and genres. It also refers to what they can do and what they want at the beginning of the course (Busturkmen, 2010). In other terms, PSA refers to specific group of learners current level in language skills throught collecting and analysing information about them in order to determine from where to begin overcoming challengies.

1.12.2 Target-situation Analysis

Analysis of the target situation (TSA) focuses on the learners' future roles and the linguistic abilities and knowledge required for them to succeed in their fields (Busturkmen, 2010). That being said that, it places attention on students' goals and potential for progress in the course in order for them to succeed in their domains and have a solid knowledge of their desired objectives.

1.12.3. Pedagogical Needs Analysis

When conducting needs analysis technique, a researcher should not only rely on PSA and TSA, but s/he should also take into account the pedagogical needs analysis in order to accomplish the intended objectives. West (1998) proposed the phrase "Pedagogic Needs Analysis" as a broad term to cover deficiency analysis, strategy analysis or learning needs analysis, and means analysis. In deficiency analysis, the emphasis is on both the beginning situation of the learners, along with the target situation. West (1994) said that the strategies of needs analysis that have been founded to integrate both the demands of the target situation, and the learners' current desires and needs may be referred to as analyses of learners' deficiencies or lacks.

In strategy analysis, west (1994) noted that language instructors specifically, need to be aware of the preferred approaches and strategies to learning and expectations for subject matter that their students have when learning a language. Thus, to make sense of learning, and means analysis, this approach proposed by Halliday and Cook (1982), it refers to the external elements that have an effect on the learning process. This means that what functions well in one circumstance could not function in another.

Conclusion

This chapter gave an overview to English for specific purpose. Due to its main assumptions, such as the significance of taking into account learners' needs in addition to a learner-centred approach, this field of study has flourished and is still growing. In the current chapter, the researcher put an attempt to provide some information about the historical development of the field of English for specific purpose, as well as information about its characteristics, branches, and special connection to science. ESP in relation to language skills had been noteworthy. Also, the researcher highlighted the EAP context, in particular, and covered the idea of language needs analysis, which is regarded as the backbone of the ESP field, as well as its different types and approaches. In the next chapter, the reading comprehension in EAP context aspect will be presented and discussed.

Chapter Two: Reading Comprehension in EAP Context

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Introduction

The current chapter aims at defining the concept of reading, the purpose of reading, its types, and the reading skill in ESP. The researcher attempts to discuss the authenticity of materials, definitions of reading comprehension, the cognitive processes of reading comprehension, the factors affecting reading comprehension of scientific texts in English for academic purposes context, and its difficulties in EAP. The researcher also strives to discuss the translation process of science texts, in addition to some solutions to enhance learners' reading comprehension in EAP context.

2.1 Definition of Reading

Even though reading is a popular activity, and several studies in Applied Linguistics have covered this skill, the meaning of the word "Reading" has not been fixed to this day. Reading, generally, implies interacting with the written or printed language messages. This requires that the processing language messages which requires also an understanding of language (Liu,2010). It simply means that reading includes interpreting written language.

According to Urquhart and Weir (1998), reading is the process of receiving and interpreting information transmitted via the medium of print. This leads us to believe that reading includes decoding any language-encoded information found in written forms. Thus, it is not limited to linguistic knowledge. For Nunan (2003), reading is a fluent process of readers combining information from a text and their own background knowledge to build meaning. This indicates that by connecting the information in the text with the existing understanding, readers might guess meaning effectively. In this regard Grabe (2009) stated, "Reading is centrally a comprehending process. We read to understand what the writer intended to convey in writing, though we also do more (p. 14)." That is, the cornerstone of reading is understanding what the writer wants to express.

2.2 The Purposes for Reading

As readers, we read a diverse variety of texts, some of which we purposefully choose to read and others of which we seem to randomly pick up or come across. For instance, people read forms to complete them, read emails to send and receive, and read everything they write several times. In a more formal context, people regard reading in academic settings or in the workplace as a necessary component of learning or participation in daily tasks. In educational, professional, and occupational settings, numerous individuals also read material that can be rather demanding. Several learning activities take place in these latter contexts, and one of those operations involves reading and interpreting informational materials in accordance with the objectives (Grabe, 2009).

Many people read for a variety of motives. When reading, readers engage with the text, mentally process it, and perceive the content to achieve their objectives. In fact, reading is a necessary process for researchers to develop in order to reach their full academic potential in the academic setting. In our EAP context, post-graduate students typically are urged to write original works, yet reading prior papers is undoubtedly the first step in that process. Even so, it is feasible to find problematic for biology students to read in a foreign language with comprehension. Thus, writing is their purpose behind reading (Grabe, 2009).

2.3 Types of the reading process

Readers read in many diverse types when they read for different objectives. Grabe (2009) listed some types of reading these are presented in the following:

2.3.1 Reading to evaluate and use the information

In this type of reading, readers are highly required to read critically the text, and examine its information using their existing knowledge about the topic of the text. Also they are required to interact with the ideas. According to Grabe (2009), readers are occasionally needed to evaluate and use information from multiple texts in academic and professional settings. This necessitates them to decide which parts of the text are the most significant, persuasive, least persuasive, or controversial. Furthermore, readers must choose how to integrate the information within that text to other knowledge, as well as to their previous knowledge and opinions.

In the same vein, Zhang and Duke (2008), highlighted that the reading types for each purpose differed at the very beginning of reading. Thus, readers who read to evaluate and use specific information exhibit a three-phase process. Readers use a search engine to find sources that would probably have the necessary information during their initial phase of research. During the on-site reading phase, readers check the websites they have obtained using a search engine. In the phase of reviewing information and making decisions, readers evaluate the knowledge they have obtained in order to make a choice regarding whether they use or not. The following figure illustrates how readers can obtain specific information and use it.

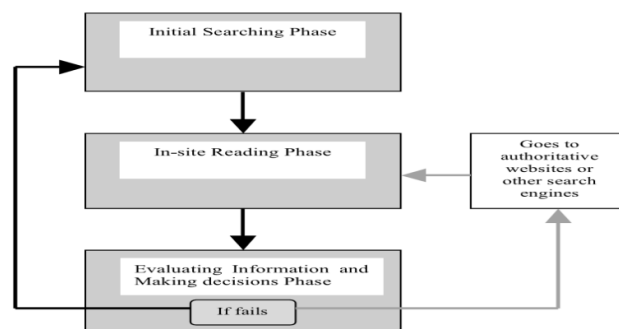


Figure 3: Reading for the purpose of locating specific information by Zhang and Duke (2008)

2.3.2 Reading Comprehension

The most typical reason for reading among proficient readers is to understand what is being read. It is true that general comprehension processes serve as a foundation for other reading purposes, but Grabe (2009) emphasised that general reading comprehension is more than that. It is a type of reading that is handled out naturally for lengthy periods of time and with what appears to be few processing difficulties. Grabe added that due to the extraordinary number of hours spent on automatic word recognition, syntactic parsing, meaning formation, and text building comprehension operations. All of which take place under extremely limited time. That is why reading for general comprehension for Native language readers evolves over time to seem effortless. Because foreign language readers typically have far less exposure to the target language text, reading for general comprehension might be challenging for them due to their lack of fluency under time limitations. which leads us to believe that the limited exposure to materials written in foreign language is the root of non- native readers difficulty with reading comprehension and absence of fluency.

2.4 Definitions of Reading Comprehension

Reading comprehension (RC) is the capacity to understand a written text by making connections between the ideas presented in the text and the reader's prior knowledge. According to Lenz (2005), "Reading comprehension is the process of constructing meanings from the text" (p. 1). This reveals that a central aspect of reading comprehension is the readiness of the reader to connect the meaning of the text with their existing understanding land reading intentions. In the same vein, Snow (2010) defined reading comprehension as the process of interpreting and constructing meaning when dealing with written text. A proper comprehension occurrence required a solid matching between the reader's capabilities, the text's specification.

2.5 Reading Comprehension Processes

Numerous cognitive processes operate while we read. Grabe (2009) made it clear that necessity on complex cognitive processes when he discussed how reading works. Thus, this is why researchers have looked at reading in terms of its basic skills and knowledge bases because of the processing complexity that results from reading. On the latter, the available literature suggests the following processes:

According to Grabe (2009), it is important to understand the function that lower-level processes engage in the reading process. These operations include word recognition, semantic-proposition encoding, and syntactic interpretation (using grammatical information). These operations are performed as a part of working memory. Without the proper functioning of these processes, comprehension cannot take place.

5.1. Word Recognition

One of the primary components influencing reading comprehension is now universally recognised by academics to be word recognition (Grabe, 2009). This implies that word identification is a cognitive task in which the reader recognises the vocabulary. Thus, the majority of researchers agree that a rich vocabulary is necessary for fast, automatic word recognition, which is needed for smooth reading comprehension. They argued that the aspect of understanding which is specific to reading is word recognition. Grabe stressed that in order for a reader to recognise words on the page competently, s/he must do that rapidly, activate connections between graphic, and phonological information, appreciate semantic and syntactic resources, recognise morphological affixation in more complex word forms, and access their mental lexicon. Word recognition skills are typically described in terms of these subskills.

In the same line, Verhoeven and Perfetti (2008) claimed that the first step in reading text is word recognition, or the mechanisms that turn the visual input into a linguistic representation. Thus, word recognition is the act of seeing a word and recognising its pronunciation immediately, naturally, and without any conscious effort. In order to clearly illustrate the cognitive processes while reading, see (figure 1).

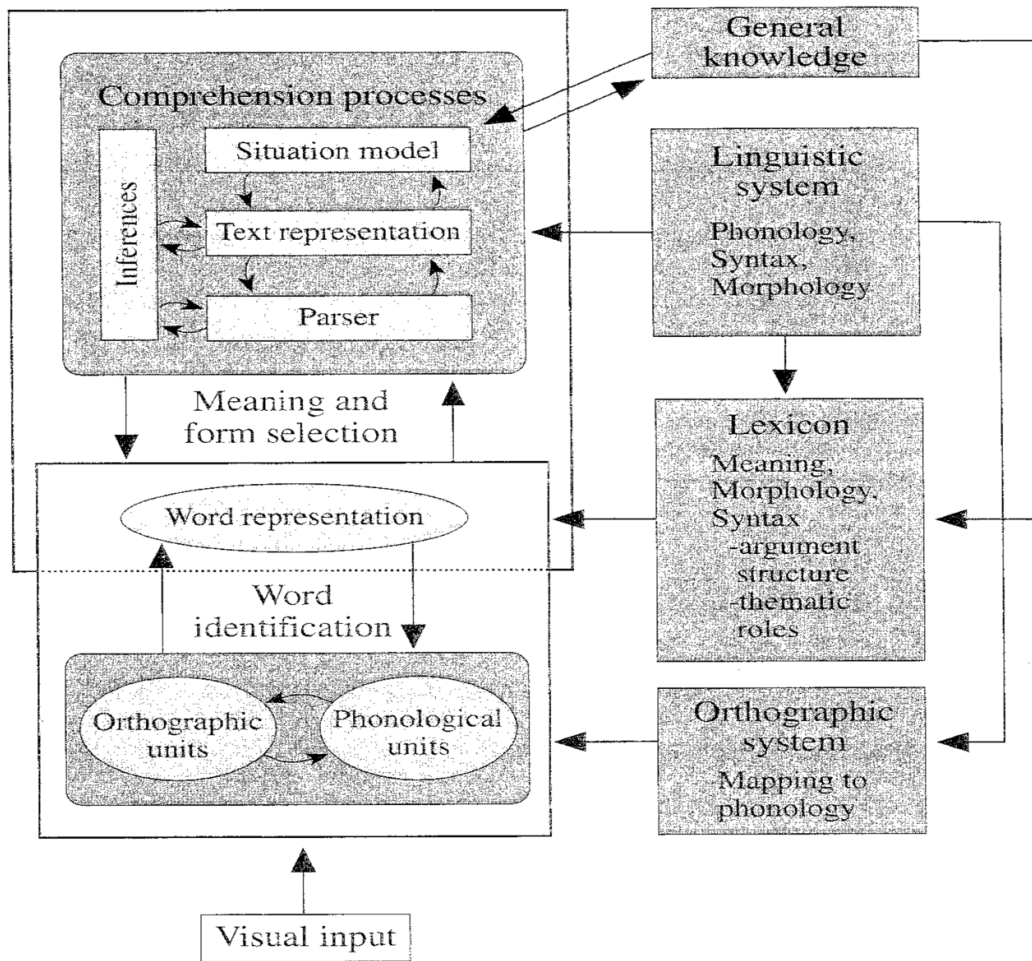


Figure 4: Model of reading comprehension processes (Perfetti, 1999).

2.5.2 Orthographic Processing

Orthographic processing is a part of word recognition. It is crucial since it helps in identifying more complicated words that contain one or more morphological affixes (Grabe,

2009). This implies that orthographic information are important for the reader's vocabulary development and for comprehending the words they read. Grainger (2018) stressed that reading is both a visual and a linguistic skill. Thus, when seeing the written word as both a visual object and a linguistic entity, it is easiest to understand the significance of orthographic processing for understanding reading, in general. According to this viewpoint, single word reading combines linguistic processing with visual object identification mechanisms, with orthographic processing operating as the link between the two.

That is, in contrast to other types of graphic symbols, orthographic processing enables general visual processing mechanisms to interact with the linguistic processing that is unique to word stimuli. That is to say, the link between linguistic and visual word recognition is orthographic processing during reading. Additionally, visual features trigger the representation of letters, which in turn triggers three routes to meaning: By way of whole-word orthographic, Morpho-orthographic, or Sublexical spelling to Sound(Grainger, 2018). As depicted in figure 2, which demonstrates that single word reading is primarily based on letters.

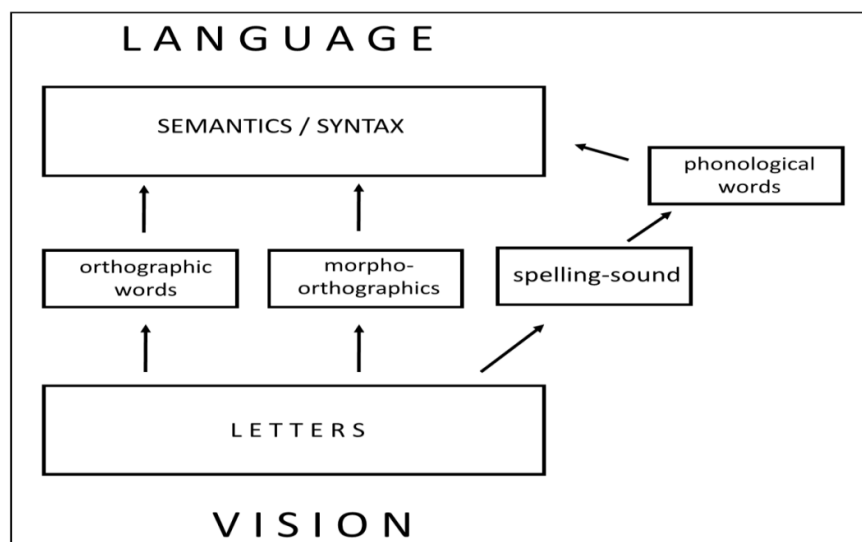


Figure 5: Orthographic processing as the interface between visual and linguistic processing

during reading (Grainger, 2018).

2.5.3 Phonological Processing

Is a complicated cognitive skill that uses a variety of interactive processes, comprehension in reading is a complex combination of activities rather than an all-or-nothing activity that is influenced by both lower-level and higher-level components. Several sources provide information to support of the function of the phonological component. More specifically, phonological processing, which is the process of connecting printed letters to phonemes, is one of the lower level verbal processing mechanisms. Because there is no one-to-one correlation between phonemes and graphemes, these reading-specific processing is especially challenging for FL readers, Khatib and Fat'hi (2012). In the same vein, Grabe (2009) said that the large percentage of words establish phonological activation precede lexical access as part of a process that incorporates interaction between orthography, phonology, and meaning. He added that the phonological processing is a crucial component of word recognition. This means that readers often engage in a crucial cognitive process termed phonological processing while reading printed words in which they associate the letters with phonemes, or sounds of language, is the cornerstone of decoding. In other words, the act of processing phonological information is seen as an aspect of word recognition.

2.5.4 Semantic and Syntactic Processing

It is argued that a great deal of researchers agreed that word-integration and comprehension processes require semantic and syntactic knowledge that come after word recognition (Grabe, 2009). This assumption indicates that syntactic processing occurs while readers read and concentrate on the language's grammar in single sentences. Thus, it is significant since it aids in understanding the process and the predicting of the words that will appear after that in the sequence, in addition to semantics which determines reading

comprehension. The same researcher noted that a language's suffixes and prefixes are processed as part of the word recognition process, and the identification of morphological markers aids in cuing syntactic information related to the word and identifying its base form.

2.5.2 Working Memory

Grabe (2009) asserted that the concept of memory as a whole is essential to all components of cognition, and that working memory (WM) and long-term memory (LTM) are the two main components of memory. While long-term memory is an important reading resource, working memory is a crucial cognitive component for reading comprehension. This author claimed that working memory plays a direct and well-established role in lower-level processing for reading. Phonological, orthographic, and morphological processing are supported by working memory for word recognition. The latter organises and combines activated words, performs syntactic and semantic comprehension at the level of the sentence, and stores the relevant details to enhance text comprehension. In the light of what has preceded, we can deduce that reading comprehension is the result of cognitive processes. And the two basic types that represent the ways humans store and retrieve the knowledge they encounter are short-term memory (STM) and long-term memory.

2.6 Different Models of Reading Comprehension

In reading comprehension there are three models that are essential to comprehension. These models are: Bottom-up Model, the Top-down Model, and the Interactive Model. In what follows these models are presented in some details respectively.

2.6.1 The Bottom-up Model

Babashamsi et al, (2013) as cited in Paran (1996) assumes that the bottom-up reading model is to recognise each letter, groups the letters observed into words, and then combining

the words into phrases, clauses, and sentences. Meaning is only accessed once at each level, and processing from earlier levels is always performed. According to the aforementioned assumptions, the Bottom-up Model to reading comprehension starts with vocabulary and moves up to sentence level. A weakness of such a reading strategy is that learners' comprehension of the overall content will be hindered if they concentrate too much emphasis on word-by-word decoding. Due to the short-term memory's capacity limitations, a slow decoder is more likely to forget the meaning of the reading that came before it.

2.6.2 The Top-down Model

The Bottom-up Model directly contrasts the Top-down Model. According to Babashamsi et al, (2013) as cited in Bartlett (1932), the Top-down Model emphasises the reader's inferencing of adequate information from a text in order to confirm or reject certain assumptions or prior knowledge. Unlike, the Bottom-up Model, which includes the lower-level linguistic processing, one of the main reading theories, termed as the "schema theory," is where the top-down model originated. Thus, certain skills, such as skimming, scanning, recalling prior information, predicting, evaluating the author's intention, and visual connection, are used in the Top-down Model. Each schema is filled up and stored in its own area. Learners can make mental connections between past knowledge and new knowledge through reading comprehension processes.

2.6.3 The Interactive Model

Reading is considered as an interactive process in which readers interact with the text, and its meaning. According to Babashamsi et al, (2013) as cited in Alyousef (2005), the Interactive Model emphasises automaticity or reading fluency and refers to reading as an "Interactive" process between a reader and a text. According to this view, the reader engages with the text to expand its meaning, depending on a variety of types of knowledge, including

linguistic or universal knowledge (Obtained through Bottom-up processing), and schematic knowledge (through Top-down processing).

2.7 Reading skill in English for Specific Purposes

The significant increase of reading in ESP is related to serious changes in ESP. This transition from the analysis of language use at the sentence level in various communicative contexts to the next stage of development, where reading pedagogy in ESP made significant progress, that shifted focus to the level above the sentence, indicates that ESP became closely involved with the developing field of discourse or rhetorical analysis (Hirvela, 2012). This shift in emphasis cleared the way for completely new reading strategies. Emphasis is placed on authentic materials gathered from diverse fields to improve this transmission process. Reading was being positioned by ESP as an important activity, similar to writing. learners may still learn a general set of fundamental reading comprehension skills in ESP classes that are useful in a variety of reading contexts. This shifting situation was noted by Dudley- Evans and St. John (1998) in their observation that reading instruction was increasingly taught from the standpoint of texts as information sources rather than their simply linguistic features.

In the same vein, For John's and Davies (1983), they used the acronyms TALO, which means Text as Linguistic Object, and TAVI which signifies Text as a Vehicle of Information. In TALO, selection criterion checks for texts that illustrate syntactic structures, have topics of general interest, and texts that have been modified (updatation). In contrast, in TAVI, the text is directly related to learners needs and has its communicative value, topic of specific interest, and no modification in choosing texts (no authority to modify it). Also, paying attention to the text selection for the target group often drives from a particular field of study. It is essential to improve the reading skills in English for specific purposes and make

sense of learning. In other words, it uses the potential academic value of a text as its primary selection criterion.

2.8 Authentic Materials

English for academic purposes studies have long emphasised the significance of authenticity in both activities and materials. Some researchers support the use of real materials in EAP context because they think they offer the clearest approach to get EAP learners ready for the demands of regular settings. Hyland and Shaw(Eds.) (2016) affirmed that in order for EAP learners to learn academic conventions as well as the challenges they will face and the solutions they will need to overcome them, authentic texts should be used "as early as possible," according to some EAP practitioners. The authenticity of the learning target is what signifies authenticity, not the sources of the materials.

In this case, texts that are most effective in assisting students in achieving pedagogical goals are regarded to be the most authentic in that particular instructional context. The designers of the materials consider that in EAP contexts, where real information would simply frustrate learners, adapted materials have a significant impact. EAP programmes that offer a series of courses can be based around adapted materials. Although more advanced courses can incorporate materials that are more closely matches academic texts.

Whether EAP teachers use original resources, modified materials, or a combination of the two, the problems associated with material selection continue. Thus, EAP practitioners frequently bring in additional materials to the class (from newspapers, academic journals, the introductory chapters of textbooks, or YouTube) to fulfill the needs of the students. They continued, EAP practitioners struggle to find resources that improve on course content, lend themselves to academic objectives, and complement students' demands, proficiency levels, and interests. The following factors should also be taken into account: Topic, Genre,

Audience, Language, Rhetorical Function, Organisation, and Purpose. Deciding on and designing EAP tasks and materials are crucial. Finding engaging content, as well as defining objective activities, texts, genres, and vocabulary, could serve as starting points. Therefore, tasks and EAP materials need to be implemented together. learners are not well-prepared for the demands of academia by materials without supporting activities. The majority of authentic resources do not come with accompanying assignments, so EAP teachers often develop these tasks in order to meet the objectives of the EAP course. The difficulty is always to distinguish between materials and tasks creates relationships between them more tricky. For instance, "reading guides" (created as course materials and provided as handouts to students) can be used as a material of a complex task sequence that engages students in purposeful reading in order to promote comprehension, increase students' awareness of text structure, and serve as a model for effective reading techniques, Hyland and Shaw(Eds.) (2016).

2.9 Factors Affecting Reading Comprehension of Science Texts

Even if learners can decode, read, and comprehend words on the page when reading scientific materials, it can still be difficult for them to connect the words together to make sense of them. For other learners, the words continue to be just a collection of letters rather than an organised, understandable, and meaningful message. There are several factors that contribute to comprehension problems from inadequate word decoding skills to a lack of domain-specific knowledge to the inability to read science publications effectively (McNamara & Ozuru, 2005). According to Allington, (2002) cited in Ozuru and Mc Namara, 2005), science texts have difficult vocabulary and syntax, as well as a larger emphasis on drawing conclusions and using prior knowledge.

2.9.1 Background Knowledge

One of language's four major skills is reading. In fact, it refers to the capacity to decode what has already been read. The reader needs to understand the sentences in order to comprehend a reading text. As a result, reading comprehension is a challenging process because it takes into account a variety of factors, including prior knowledge. According to the Schema Theory, Abdelaal and Sase (2014) asserted that there is a direct link between background knowledge and reading comprehension. Readers need to have a general understanding of a given subject or object in order to comprehend the meaning. On this idea, every new experience strengthens the schema. The result is that, a large amount of knowledge or information will be on various subjects and will have an impact on overall reading comprehension.

Hence, prior knowledge or schema can contribute to reading comprehension. According to Shaprio (2004), cited in Abdelaal and Sase (2014), prior knowledge has a significant impact on reading comprehension because it helps readers expect what else will happen in the next few lines. However, it is crucial for readers to have accurate prior knowledge because incomplete knowledge about a subject can lead readers misled. On the other side, reading comprehension is hindered by the absence of such prior knowledge.

In the EAP context specifically, we believe, our sample the PhD students of Biology, has a difficulty in reading and comprehending science texts. This struggle may be caused by the absence of domain-specific knowledge, and the lack of prior knowledge about the subject or research work they are investigating, as well as a possible absence of schema because their doctoral field of study is not a direct match of their Master's specialty, which results a negative impact on their understanding and leads to their challenges. In sum, many researchers agree that prior knowledge, or schema are strongly associated with reading

comprehension, and they stress the need of activating the appropriate prior information to facilitate readers' reading difficulties. The relationship between prior knowledge, reading comprehension, and schema theory is summarised in the framework below.

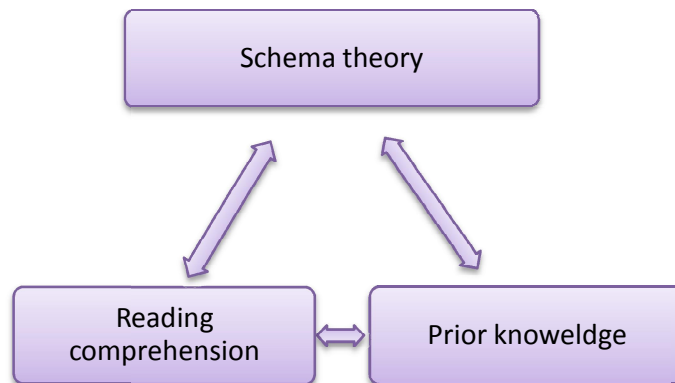


Figure 6: Relationship between prior knowledge, reading comprehension, and schema theory

Abdelaal and Sase (2014).

2.9.2 Engagement and Interest

Hidi (2001) discussed how interest affects readers' understanding and learning. He emphasised that studies on the significance of reading interest have focused on a few fundamental topics. The impact of interest on reading performance is undoubtedly the most significant and frequently researched problem. He suggested that all kinds of interest tend to make reading easier and aid in memory. On the light of what precedes, it is reasonable to believe that a lack of interest can usually result in poor understanding, a lack of drawing accurate conclusions, an inability to understand the significance of the ideas presented in science publications and materials. and increase the learners' reading challenges. Besides, they also stop engaging in critical thinking as a result of the absence of interest in reading.

2.9.3 Inability to Read Science Publications in English Language Effectively

Reading, understanding, and comprehension in a second/ foreign language especially English language pose significant challenges for learners, teachers, because some students may not have the necessary exposure to linguistically proficient peers, a supportive and, the absence of reading publications in second/ foreign language, or other enabling factors (Mohammad & Hasbi, 2021). In other terms, the academic environment can contribute a part in creating reading and other linguistic skills in learners with English as a second or foreign language. Indicating from this that the learners' limited exposure to these materials and to the language itself, which causes them to be unfamiliar with the text and content, may be the source of their incapacity to understand their specific domain publications in English effectively. Due to their familiarity with French rather than English, our sample are having trouble comprehending materials written in English. In other words, these learners have prior exposure to texts and materials in French language while pursuing their license and master's degrees. In point of fact, french language is dominating science domains in Algeria.

In a similar context, Kurland (1983) stressed that learners' difficulties with science texts may not be due to learning comprehension, but rather from their inability to comprehend the nature of scientific discussion. Despite the fact that this may appear to free the reading specialist of a significant responsibility for aiding the learners with this obstacle, only a reading specialist has the expertise and educational orientation to offer the assistance required. The absence of reading specialists in this fields often leads to this kind of educational difficulties. Because science teachers tend to focus more on content than reading comprehension issues, they typically lack the expertise and time to make efforts to help students to be aware of the value of reading for effective learning, academic success, and expanding their knowledge in their field of study. Thus, In order for students to advance and

learn, according to Kurland (1983), one must have some understanding of the assumptions, perspectives, difficulties, and the organisation of the concepts presented in any field, specifically the scientific fields of study in non-English Departments. Without this comprehension, the sentences are just a collection of words, and the statements are unrelated, unclear pieces, which should be fully comprehended rather than just memorised.

2.9.4 Limited Vocabulary Knowledge

In the academic context, in which ESP readers of are aware that they may have serious difficulties in mastering English language due to their inadequate vocabulary knowledge. In order to improve ones self basic competence in the four language skills, lexical knowledge is a crucial component. For ESP learners, technical vocabulary are technical words directly connected to a specific area or field of study such as, medicine, Biology, linguistics, and so on. This technical vocabulary knowledge is with great importance for good comprehension and increasing the understanding about specific field of study. As a logical consequence, there is a strong connection between vocabulary knowledge and reading comprehension because lexical knowledge can help non-native language learners to understand the meaning of written texts. Thus, reading comprehension and ideas interpretation are significantly and negatively impacted by restricted vocabulary knowledge.

One factor contributing to those student low vocabulary knowledge is the learners' lack of knowledge of the effective reading comprehension methods they needed, and learner vocabulary ambiguity is also another factor. Moreover, poor reading comprehension skills are evident by the extent that learners rely on context to interpret words (Al-Khasawneh, 2019). The author stressed that reading is a way to increase the knowledge. In fact, since English language is widely accepted as the popular language and many publications are published in English in almost all academic fields, learners in higher education are required to read heavily

in this language in their field of study to empower and extend their vocabulary. In the light of what has preceded, we can say that low vocabulary knowledge often leads to low level of reading comprehension and difficulty to construct meaning from written texts. All this leads the present researcher hypothesise that the difficulties in reading comprehension are caused by having problems in language knowledge that consist in vocabulary.

2.10 Translation of Science Texts

In the academic context, it has become particularly important to learn and comprehend different scientific publications written in English language. However, this act can hold considerable problems for students. In other words, it is inaccurate for these learners to use translation as a means of understanding because It can be challenging to communicate a scientific text's exact meaning through translation, especially with the complexity of the language used in science texts. In addition, some concepts may not exist in the target language, without neglecting the importance of language grammar and structure. The latter vary from one language to another, in which students must be aware of the grammar and structure differences. In the present study, in the preliminary discussion with the target participants, the latter said that they heavily depend on translation technique, since they have very basic knowledge about English language grammar, vocabulary, and other aspects. In other words, they translate scientific texts, articles, documents, and so on in order to build a thorough understanding about the topic.

Also, they said that they can only understand some technical vocabulary while reading, yet the ideas represented in the texts and sentences connections are challenging to understand. Similarly, the act of translating the ESP texts was highlighted by Malekan and Mohammadi (2017) as a serious issue that learners commonly encounter. For a considerable period of time, translation was a vital approach for improving literacy in the teaching of the

English language; Yet, with the development of new methodologies for learning and teaching English language, as well as with the adoption of new thoughts in reaction to previous ones, translation has become increasingly ineffective. In this regard, Malekan and Mohammadi (2017) explained that, and provided a selection of the most noteworthy counter arguments against translation in language instruction. Firstly, translation does not help students improve their communication abilities. Secondly, translation does not help students improve their language skills. In addition, it encourages the use of L1 rather than L2. Third, the ability to translate is challenging and not necessarily beneficial, especially when dealing with science texts.

2.11 Some Solutions to Enhance Reading Comprehension in EAP Context

English is regarded as a worldwide language with implications in every field. Grammar and vocabulary are the primary components of the English language, but although vocabulary is essential to learning the language, learners cannot interpret or comprehend what they read without having a broad range of vocabulary. Without having vocabulary knowledge, these learners encounter different struggles among them inability to comprehend (See p. 12). Numerous researchers and ESP practitioners are working to offer solutions that can help overcome the obstacles of poor reading comprehension in the EAP context. What is coming are some solutions proposed by researchers, and at the same time an answer to the question; how would ESP students improve their English language and reading comprehension in EAP context.

2.11.1 Intensive Reading Strategy in EAP Context

Khazaal (2019) examined on the effects of an intensive reading strategy on higher education learners studying English for specific goals in terms of vocabulary development. To determine whether the ESP learners' vocabulary development was affected by the intensive

reading strategy. In his opinion, this is because every word has its own form, meaning, and function, and struggling to comprehend even a few words in a sentence might hinder comprehension. For that, this researcher proposed the intensive reading strategy, which is the practice of carefully and deeply reading each word of a text from beginning to ending. Therefore, complex texts with lots of new terms that demand for the use of a dictionary are typically read intensively. By this research, it was discovered that ESP learners' use of vocabulary through an intensive reading technique has significantly improved. The findings suggested that intensive reading could have a more desirable effect on learners' attitudes towards vocabulary acquisition. In light of these results, it is recommended that an intensive reading strategy can be quite effective in helping learners acquire additional vocabulary.

2.11.2 The Use of Scanning Techniques in EAP Context

ESP learners limit exposure to the tasks of reading carefully in a limited period of time in their university life, which raises their challenges and failure to get the needed information. From this point, Khazaal (2021) suggested the use of scanning techniques to improve ESP learners reading comprehension proficiency. The purpose of the study intends to determine how scanning strategies can enhance ESP learners' reading comprehension abilities. The author considered scanning as an effective technique for students to comprehend long, complex, and academic texts. It is a technique to implement when the reader needs to retrieve certain pieces of information quickly.

The following are basic steps for proper scanning of the texts highlighted by Khazaal (2021). Firsly, learners should make an effort to comprehend how the text is organised before they start scanning for information, and they state the specific data that are looking for. Secondly, while reading the text, learners should highlight or underline the informations. Thirdly, before starting to scan, read each question. Then, choose a keyword and search in the

text for it. Then, repeatedly scan the text with your eyes moving quickly from left to right, up, and down. Moreover, after you have identified the necessary information, intentionally review the sentences to ensure that you have fixed the appropriate ideas needed. Through scanning technique, readers can read carefully in a short period of time. The researcher revealed that learners can easily understand English texts through using scanning techniques. Thus, It is recommended that teachers of English language implement and guide scanning technique when teaching reading to raise their awareness, and eventually understand English texts more effortlessly.

2.11.3 Text Structure Strategy in EAP Context

Beddiaf and Hocine (2020) proposed a strategy termed text structure strategy. This strategy in their view is highly significant in enhancing ESP learners reading comprehension. They claimed that in several Algerian universities English for Specific purpose (ESP) has been a prominent and necessary topic. Thus, for ESP learners, reading in English has become a necessity. These learners should read materials in that language because English is frequently used as a source in many academic fields and publications. They highlighted that one of the most crucial abilities that should be developed in ESP academic contexts is the capacity to read in a second language (L2). Though, in order to understand written texts in English, ESP learners must use reading comprehension strategies.

The organisation of ideas used by any writer to convey a message is mirrored in the text structure strategy. For ESP learners to understand texts in English, they should be aware of the effectiveness of using reading strategies, in particular text structure strategies, whereby they encounter a variety of texts, such as cause-and-effect, contrast, comparison, etc., by that they will understand the various patterns of organising a text. Also, teachers need to be aware of how well teaching text structure strategies helps ESP learners comprehend the material

they are reading. The researchers emphasised that improving learners' reading comprehension requires showing them the significance of applying reading strategies, particularly text structural techniques. Because it will help these learners become skilled readers and improve their reading comprehension.

More specifically, teaching text structure understanding strategy to learners is useful for better reading comprehension of texts. They therefore arrive to the concluding that it is necessary to give these strategies additional attention in order to convey them explicitly and make sure the learners are aware of them. In the light of what has been presented so far, one can assume that text structures are the means through which authors arrange texts and highlight major themes. A learners' capacity to extract the content they are reading enhances if they are aware of text structures and their function. Text structures contain words and phrases with semantic cues that assist students in understanding the text as well as in producing more coherent and understandable original writing.

Conclusion

One of the most fundamental skills to increase English language proficiency, more specifically, to develop the learners' performance in academic contexts is reading. Reading academic publications related to learners field of study can help them gain more knowledge. The researcher, in this chapter, covered the topics that needed to be discussed. starting with a definition of reading as it is defined by academic researchers, its purpose and types, and reading skills in ESP. Moreover, the authenticity of the materials in ESP had been tackled. Also, reading comprehension processes and factors that contribute to ESP learners' lack of comprehension of science publications were discussed, in addition to certain suggested solutions. The process of translating scientific texts was also explained. In the next chapter,

the methodology selected for this study work will be presented for a better understanding of the methodology.

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Introduction

In the current chapter, the researcher attempts to provide a theoretical background on the research methodology underlying this study. It attempts to describe the approach, the adopted strategy, and the data collection methods used in this investigation in order to highlight the situation and needs of the target group, and detect ESP students reading comprehension challenges in EAP context. Additionally, it provides the rationale behind adopting each of the data collection methods.

3.1 Research Methodology for This Study: Theoretical Background

It is believed that methodology is the central element in any study, and a primary foundation that guides research. According to Kothari (2004), research in a common sense which refers to a search for knowledge. It can also be defined as a scientific, holistic steps, and systematic search for certain needed data on a specific topic. In fact, research is an art of scientific investigation. Kothari (2004), added that

" research is actually a voyage of discovery. We all possess the vital instinct of inquisitiveness for, when the unknown confronts us, we wonder and our inquisitiveness makes us probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which man employs for obtaining the knowledge of whatever the unknown, can be termed as research." (p.1).

Thus, the essential components of research in terms of methodology are covered in the items that come next.

3.1.1 Research Paradigms in Educational Research

The term "paradigm" is used in educational research to refer to a researcher's worldview. According to Kivunja and Kuyini (2017) as cited in (Mackenzie & Knipe, 2006), this worldview, which informs the interpretation or meaning of research data, is a perspective, way of thinking, body of consideration or collection of common perspectives. Kivunja and Kuyini (2017) stated that a paradigm "defines the investigator's worldview," (p. 27). What the researcher really mean is that a paradigm constitutes the abstract beliefs and principles that shape how a researcher views the world, how they interprets, and acts within that world. It is the a lens through which a researcher perceives the world. It is the conceptual lens that the researcher makes use of to determine the methodological aspects of their research project in order to choose the research techniques that will be applied, and how the data will be analysed. In other words, the paradigm indicates the philosophical perspective of a researcher. It describes how meaning will be created based on our unique experiences from the data we will collect. Therefore, it is crucial that you identify the paradigm in which the researcher situate the research while writing.

In educational research, a number of research paradigms are suggested. In this respect, numerous paradigms have been put up by researchers. The most common paradigms are explained in the following:

3.1.1.1 The Positivist Paradigm The positivist paradigm defines a research position that is based on what is known in research methodologies as the scientific process of investigation. It was first proposed by a French philosopher named Auguste Comte. This scientific methodology might be experimented that only provide objective results that are not accessible for numerous interpretations (Kumatongo & Muzata, 2021). In light of this, positivists assume that reality is established objectively and can be measured using characteristics that are

unrelated to the researcher and his or her means. Knowledge in this Paradigm is believed to be measurable and objective. Thus, to improve precision in the description of parameters and the relationship between them, positivists employ scientific methodologies and structure the knowledge generating process with the help of measurement.

3.1.1.2 Post-positivist The concept of post-positivism was initially presented by the French philosopher Auguste Comte. This research paradigm specifies a perspective that centers on what is known as the scientific method of research. Hoadjli (2016) stated that the post-positivist assumption has served as a representation of traditional research, and they are more accurate for qualitative than for quantitative research. This kind of thinking is commonly referred to as the scientific method or conducting scientific research. The deterministic philosophy of post-positivists holds that causes (probably) determine effects of outcomes. As a result, the issues investigated by post-positivists represent the necessity to recognise and evaluate the factors that affect the results discovered in experiments.

3.1.1.3 Interpretivist Paradigm As a reaction to positivism, interpretivism paradigm emerged. It includes various interpretations and seeks to fully understand the phenomena under study from the perspectives of those who are directly affected. As the entire paradigm centers around respecting individuality, generalisation is not attempted in this method and cannot be attained. According to Elshafie (2013), most qualitative methodologies are thus employed in the interpretive approach. In the light of what has been mentioned, the investigator can gain an understanding of another individual's reality through their experiences, which may vary from one person to the another due to differences in social and educational backgrounds. For the purpose of gaining a thorough and deep understanding of the phenomenon being investigated, this paradigm is based on techniques like making observations and asking questions. With regard to this, it has a direct connection to qualitative

data collection methods. According to the assumption of a subjectivist, Kivunja and Kuyini (2017) claimed that researchers interpret their data based on their own reasoning and cognitive processing of the data, which is influenced by their interactions with participants.

3.1.1.4 Pragmatic Paradigm Hoadjli (2016) believed that rather than prior conditions (as in post-positivism), pragmatic assumptions emerge through acts, contexts, and consequences. Applications and problem-solving approaches raise several questions. Instead of concentrating on methodologies, researchers emphasize the study of challenges and employ all possible approaches to comprehend the problem. In terms of a philosophical framework, scholars explain the significance of mixed methods for concentrating attention on the study problem in social sciences research and using pluralistic ways to generate knowledge about the subject. Which implies that pragmatism is a paradigm that includes different principles and techniques in order to achieve and find out practical solutions to the challenges.

3.1.2 Research Approaches

Research approaches are guidelines for conducting studies that cover anything from general hypotheses to specific techniques for gathering, processing, and interpreting data. Thus, selecting an approach to study a particular topic is the main choice. This choice should be based on philosophical assumptions that the researcher brings to the investigation. In the light of the above mentioned research paradigms, there are three fundamental research approaches as suggested in the literature: Qualitative approach, Quantitative approach and Mixed- methods approach.

3.1.2.1 Qualitative Approach With a qualitative research approach, attitudes, views, and behaviour are evaluated subjectively. In such a setting, research is the product of the researcher's perceptions and insights. According to Kothari (2004), such a research methodology produces findings that are either non-quantitative or that did not go through

thorough quantitative analysis. Focus group interviews, projective techniques, and in-depth discussions are all commonly used. In the social sciences, qualitative research has been used for about a century. As a result, the fundamental concepts and principles of qualitative research are not uncommon nowadays. Instead, an increasing number of texts on this research methodology has occurred in recent years, indicating a growing interest in the methodology across social scientific disciplines as explained by Hoadjli (2016). Since the 1990s, qualitative research has gained greater attention and acceptability in the field of applied linguistics. This is connected to the emerging understanding that social, cultural, and situational factors influence or strongly control practically every element of language learning and practice.

3.1.2.2 Quantitative Approach In essence, quantitative research focuses on collecting numerical data and using it to understand a specific event or extend it across groups of individuals. The findings of this method are supported by larger quantities that are representative of the population. Quantitative research further emphasises exact numerical data. In this sense, Kothari (2004), claimed that the foundation of quantitative research is the measurement of quantity or amount. It can be applied to phenomena that have a quantitative interpretation. In the same vein, Apuke (2017) defined this approach as one that deals with the measurement and evaluation of variables in order to provide results. In order to respond to inquiries like who, how much, what, where, when, how many, and how, it entails the use of numerical data and its analysis using specific statistical methods.

3.1.2.3 Mixed-method Approach Mixed method research is concerned with the philosophical basis of research, the paradigms that direct it, and the assumptions that influence its design and conduct in addition to collecting data. Considering that mixed method research combines quantitative and qualitative data in a single research study or series of research investigations, Creswell and Plano Clark (2011), as cited in Cohen et al. (2018), that make this observation.

Thus, in order to achieve specific and potential objectives, researchers opts to combine quantitative and qualitative methodologies, because adopting only one research approach is not always attainable. The mixed method approach was born out of this.

3.1.3 Research Design(s) / Strategy (ies)

A research design is a strategy or plan designed to structure the study, make it workable, and allow for the proper use of evidence and justifications of the answers to the research questions. Cohen et al., (2018). Thus, in the research process, an adequate design for the study is essential. The researcher starts by determining the primary objectives of the study before creating a research strategy to pursue those goals. Cohen et al., (2018), stressed that there is no one set strategy for organising research. 'Finess for purpose' is the principle that directs research design. Thus, the research's objectives determine its design, which in turn shapes its methodology.

3.1.3.1 Qualitative Designs The five major subcategories of qualitative research design that are commonly applied are phenomenology, ethnography, grounded theory, case study, and narrative inquiry. The focus of each type varies gradually, despite the fact that they are all included under the same qualitative design umbrella.

3.1.3.1.1 Phenomenology Creswell (2012) stated that “a phenomenological study describes the common meaning for several individuals of their lived experiences of a concept or phenomenon.” (p. 76). Thus, phenomenological studies study human experiences using the participants' descriptions. These experiences are referred to as real-life experiences. Phenomenological research aims to explain the significance that experiences have for each individual. This particular type of study is carried out to look into matters in which little knowledge exists (Donalek, 2004). Respondents are asked to explain their experiences in

phenomenological research according to how they perceive them. Although they might write about their experiences, interviews are usually used to gather information.

3.1.3.1.2 Grounded Theory Grounded theory is a qualitative research methodology used to establish theory. Glaser and Strauss (1967) originally introduced grounded-theory methodology. The process of creating a theory using evidence is known as grounded theory. Thus, according to Corbin and Strauss (2008), theoretical assumptions developed from qualitative investigation are referred to as grounded theory. This concept reflects the same essential methodological idea: theoretical interpretation of a phenomenon formed from data implementing core methodological standards.

3.1.3.1.3 Ethnography Ethnography deals with the discovery and description of culture of a group or group of individual. According to Sharma and Sarkar (2019), Ethnography research that is also known as cultural ethnography or cultural anthropology, is one of the most significant qualitative studies in which the researcher interacts with or observes the target population in order to gather useful cultural information. What is worth mentioning that social science research includes this type of study.

3.1.3.1.4 Case Study A case study is a research approach and type of inquiry that explores a phenomenon in its actual context in the fields of social science and life sciences. According to Coombes (2022), a case study is a type of systematic research strategy that is employed to produce a comprehensive understanding of an existing issue or event in a constrained environment. Thus, One of the most widespread and well agreed qualitative research strategies in the social sciences is the case study. As it is necessary to gain a thorough understanding of an issue, event, or phenomenon of interest, in its natural real-life setting, the case study approach is especially helpful to use. Furthermore, Case studies give researchers

the chance to comprehend a problem more thoroughly. When the researcher is interested in "how," "why," and "what" inquiries, the case study design is preferred as a research approach.

3.1.3.1.4 Narrative Inquiry This strategy of research, also known as narrative research, in which the researcher study people's stories as part of their experiences. For a complete comprehension, the researcher arranged these stories into a narrative chronology. Savin-Baden and Niekerk, (2007), defined it as an approach that focuses on using stories as data. Thus, the goal of narrative inquiry is to comprehend experience as it is lived and described through both study and literature through gathering stories.

3.1.3.2 Quantitative Designs Regarding quantitative designs, the focus should be on surveys, correlational researches and experiments that are views the major quantitative designs.

3.1.3.2.1 Survey According to Ponto (2015), survey research has generally incorporated considerable population-based data collecting. Thus, the main goal of this kind of survey research is to rapidly gather information describing the characteristics of a considerable number of individuals. This means that survey research allows for the use of quantitative research techniques, such as using questionnaires with numerical values for the items. As It includes cross-sectional and longitudinal studies.

3.1.3.2.2 Correlational Research Design With a correlational research design, relationships between variables are examined without any of the variables being under the researcher's direct control or manipulation. A correlation shows how strongly and/or in what direction two (or more) variables are correlated. A correlation's direction may be positive or negative. In other terms, this quantitative research strategy is used by researchers to correlate two or more variables using mathematical analysis procedures. According to Seeram (2019), correlational research is a form of non-experimental study that makes it easier to predict and explain how different variables are related.

3.1.3.2.3 Quasi-experimental Design Establishing a cause-and-effect link between an independent and dependent variable is the goal of a quasi-experimental design. Like a true experiment, quasi-experimental research designs try to determine the cause and effect link between the independent and dependent variables. The only distinction is that people are divided into groups using non-random criteria in a quasi-experimental strategy. According to Rogers and Revesz (2019), quasi-experimental research designs look at whether independent and dependent variables are causally related.

3.1.3.2.4 Experimental Design Bell (2009) asserted that the most common and well-liked research methodology is experimental design as an aspect of scientific research. The ability to precisely evaluate the relationship between and among variables in order to make that analysis as objective as feasible is the essence of experimental design and maybe the most significant reason why researchers choose to design and carry out experiments. A true experimental design therefore depends on investigating the connections between and among variables

3.1.3.3 A Mixed-methods Design Numerous typologies have been developed to classify and categorise different kinds of mixed method strategies. According to Hafsa (2019), Mixed methods research design is to combine and integrate qualitative and quantitative research and data into a single study.

The two mixed method strategies that are most frequently used and suggested in the literature are the convergent parallel mixed method design and the explanatory sequential. Firstly, in the convergent parallel mixed method design, the researcher at the same time gathers quantitative and qualitative data, which are independently analysed. In order to comprehend completely the results from the two data bases, the researcher also combines the two data bases by integrating the results during interpretation. Secondly, In the explanatory sequential design, the researcher links the phases via the quantitative findings to shape the

qualitative research questions, sampling, and data collection. Prior to the latter phase, the researcher gathered and analysed both qualitative and quantitative data since the incorporation of qualitative data supports in the explanation of quantitative results that require further exploration.

3.1.4 Data Collection Methods

One of the most crucial parts of a research work is data collection. Kabir (2016) claimed that in order to provide answers to stated research questions, test hypotheses, and assess results, one needs to collect and measure data on relevant variables in a systematic manner. Thus, every academic discipline of study, including the physical and social sciences, humanities, business, etc., involve the data collection aspect of research. Although methods differ by discipline.

Further, the purpose of any data collecting is to gather high-quality evidence, which can then be used to conduct rich data analysis to establish a solid rationale for answering a given question. Regardless of the subject area or method of choice for defining data (qualitative or quantitative or mixed methods), accurate data collecting is crucial to preserve the objectivity of research.

Kabir (2016) emphasised that gathering data is a highly difficult activity that requires careful planning, hard work, determination, patience, and more to be able to complete the project accurately. The first step in data collection is identifying the type of data that is needed, which is followed by the selection of a sample from a certain population. The data from the chosen sample must then be collected using a specific instrument. In this regard, the researcher has to select tools for obtaining the needed information. Different tools are used for data collection such as: questionnaire, interview, observation, focus group and tests.

3.1.4.1 Questionnaire The use of various types of questionnaires is one of the most popular ways of data collecting in second language (L2) research. Because they are simple to create, extremely versatile, and uniquely able to capture a lot of information fast in a form that is easily processed, questionnaires are quite common (Dörnyei, 2003). Thus, the major objective of scientific research is trying to find answers to questions in a systematic manner, from this it is obvious that the questionnaire has become one of the most popular research instruments applied in the social sciences. Dornyei (2003), also stated that a questionnaire has general features such as length, format, sensitive themes, and anonymity. Additionally, conducting a piloting procedure tends to be recommended for improving the quality of the questionnaire.

3.1.4.2 Interview An interview is a conversation for gathering information. Easwaramoorthy and Zarinpoush (2006), asserted that a research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions. Interviews can be conducted face-to-face or over the telephone. The internet is also emerging as a tool for interviewing. Thus, when it's necessary to gather in-depth data on people's opinions, beliefs, experiences, and feelings, interviews are a suitable way.

3.1.4.3 Observation The unique feature of observation as an investigative tool is that it allows a researcher an opportunity to collect first-hand, "live" data from typically occurring social settings (Cohen et al., 2018). Thus, using observation as the primary mode of study has the potential to produce more valid or authentic data, which implies that Observation has high face validity and can offer detailed contextual data.

3.1.4.4 Focus group Focus groups are a type of qualitative research approach in which attitudes, opinions, or perceptions of a problem, or program are investigated through a free-

flowing conversation between group members and the researcher. According to Kumar (2019), a focus group is a moderated group conversation in which a researcher brings up issues or poses questions that promote discussion among group members. The issues, topics, and various viewpoints on them, as well as any major points that come up during these debates, provide information from which conclusions and inferences can be formed. It is comparable to doing a group interview with respondents.

3.1.4.5 Tests To gather information about the participants background or level. Researchers opt for different tools. Tests are among the most useful tools in educational research. Tests possess different degrees of validity and reliability. A proficiency test is one of the most commonly used to gather data about participants levels of language. Quantitative data can be used to support qualitative research.

3.1.5 Data Analysis Procedures

After gathering the necessary information needed in the study, data analysis is frequently a continuous process that occurs both during and after the investigation. This process of preparing data entails placing it in a manner that facilitates analysis. Therefore, quantitative and qualitative data would be analysed by quantitative and qualitative data analysis procedures, respectively. For qualitative data analysis, it focuses on specific techniques and types of data analysis such as coding and content analysis, narrative analysis, and grounded theory. Next, by organising and categorising data into important concepts or determining the units of analysis, one can explore and interpret the data as part of data analysis; coding, inductive methods, highlighting and clarifying significant ideas and points, finding connections and correlations between the data, and inductive processes; summarising (Cohen et al., 2018).

It is important to note that qualitative data analysis uses textual and verbal data, whereas quantitative data analysis uses numerical and mathematical relationships. Descriptive statistics and inferential statistics are the two main divisions of statistics. Inferential statistics cope with the process of generalization, whereas descriptive statistics focus on the creation of specific indices from the raw data. Sampling statistics is an alternative term for inferential statistics (Kothari, 2004). Thus, the average, or mean, median, and mode are the three most significant central tendency measures.

3.1.6 Sampling Techniques

In social sciences, two methods of sampling are used which are probability and non-probability sampling. Probability sampling refers to a sampling technique that estimates how probable that a sample is representative of the population. The former is carried out without any intention of generalization (Pandey & Pandey, 2015). Thus, probability is a type of sampling in which each member of the population has an equal chance (probability) of being chosen in the sample, it includes random sampling, systematic sampling, stratified random sampling, and cluster sampling. In the other side, non-probability sampling is an type of selection in which each participant has a different chance (probability) of being chosen in the sample. It includes convenience sampling, voluntary sampling, snowball sampling, quota sampling, and purposive sampling. As illustrated in the following figure.

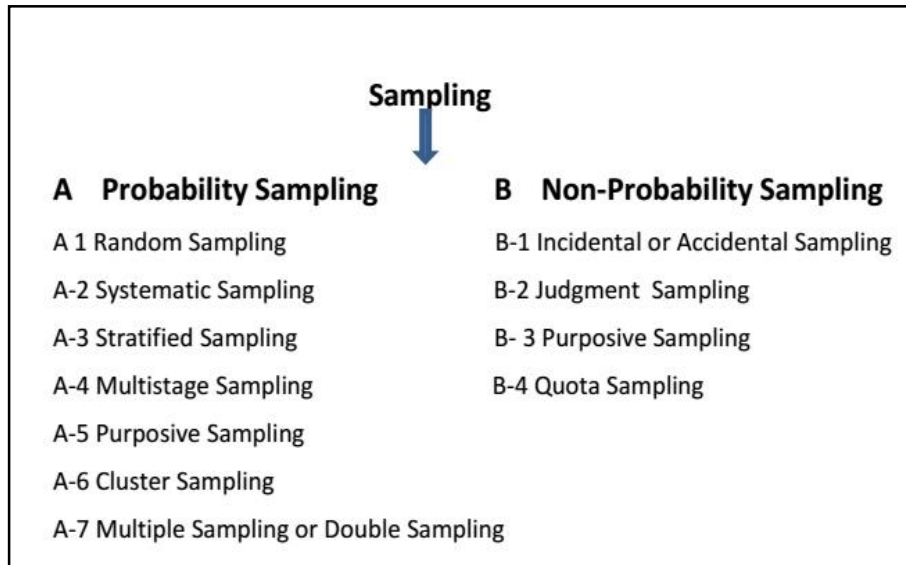


Figure 7: Types of Sampling Designs / Methods of sampling (Pandey & Pandey, 2015, p.75)

3.2. Research Methodology for this study: Choices and Rationale

Because research is methodology, in below an explanation of the selected research methodology for this research work, choices and rationale are presented:

3.2.1 Resaerch Paradigm

The interpretivist paradigm in the current study is suitable for our research's objective. Because this paradigm uses a variety of data collection tools to fully comprehend the situation being studied from the experience and perspective of the participants. Although the interpretivist paradigm permits a wide range of interpretations, generalisation is not the goal and cannot be accomplished. Additionally, the interpretivism paradigm is directly related to the methods used to gather qualitative data. In the current investigation, the researcher is investigating a phenomenon in the department of Natural and Life sciences at Biskra University and is making an effort to completely comprehend true situation, obstacles, and attitudes of second-year PhD students with regard to reading in the English language. Because of this, the interpretivist paradigm perfectly fits both our philosophy and the goal of the study.

3.2.2 Research Approach

In the current research work, we adopted a qualitative research approach since our study did not go through quantitative analysis. Instead, it provides a description of a specific educational phenomenon under investigation. In social science domains, among them Applied linguistics, the researcher once adopting this approach is required to subjectively evaluate the views, attitudes of the participants, and truthfully reported their experiences to deepn the phenomenon understanding using non-numeric data (descriptive). Since our attempts match these assumptions, we opted for the qualitative research approach.

3.2.3 Research Design

The most common qualitative research design is a Case Study. It allows researchers to produce a thorough understanding of an issue. In the current study, the researcher adopted the case strategy because it fits the researcher is attempts in stating a clear view and explanation of an existing problem, phenomenon of interest, and in its natural real-life context.

3.2.4 Data Collection Methods

In order to provide clear answers to the research questions and a rationale for these questions, the researcher needed to collect data. With regard to this, in our research work, we selected two tools to obtain the required information that are: An unstructured questionnaire and a proficiency test.

3.2.4.1 Questionnaire

3.2.4.1.1 Structure and aim The questionnaire used for this study is unstructured. It included four sections: (1) Students' Background Information, (2) Needs Analysis, (3) Learners' Language Skills Self Evaluation, and (4) Learners' Perceptions Towards English. The first section involves four questions regarding the students gender, how they evaluate their overall

competence in English, how they consider their competence in reading in English texts, and their purposes of reading texts in English. they could choose more than one option. In the second section of need analysis, needs analysis approaches are presented implicitly in the questions to gather data regarding their present situation, target situation, strategy analysis, and pedagogy analysis. The first question in students' general needs is about the reasons of English need. The second question in students' academic needs is about language skills. The third question about ranking language skills. In potential expectations sub-section, the students were asked about their needs for English in the future. Section three, included questions about how do students evaluate their language skills, and section four, about their perceptions towards English.

Thus, the students were free to add other explanations and answers from their experiences when required. It is worthy to mention that the questionnaire was translated into the french language before it was submitted to the participants, so that they comprehend it well and provide comprehensive and clear answers. The aim of this questionnaire was to portray the students' situation, their present needs, target needs, and pedagogical needs. Also, it sought to know their attitudes and views regarding the issue under investigation. After getting the target students consents to participate in the study, the researcher scheduled an appropriate time for all the respondents to deliver the questionnaire.

3.2.4.1.2 Piloting and Validation The piloting process is advisable to improve the quality of the questionnaire. For that, the piloting process was carried out after translating the questionnaire into the french language, and a week before the submission of the final version of the questionnaires to the participants. In the piloting stage, the questionnaires and opinionnaire were distributed to a small group of students to be completed. Two students,

who were selected from the population, checked whether there were any unanswered questions or unclear ones. The reason behind giving the questionnaire to only two students was the limited number of second year students of Biology.

It is crucial to say that the questionnaire and the opinionnaire were filled by the students in a face to face meeting, and not via email. Both students said that the questionnaire was well structured, organised, and included clear questions. The questionnaire was also checked by two teachers in the validation phase to benefit from their feedback and observations. One of them noted that there were repeated questions and one of this questions should be replaced by another. The questionnaire was then revised after this feedback (See appendix 1).

3.2.4.2 Proficiency Test

3.2.4.2.1 Structure and aim The test used in this study was a proficiency test. It included a text entitled " Cells Under the Microscope", and eight tasks. The first task was about reading the statements and answering by writing true or false. The second task was about matching the statements with the right definitions. In the third one, they had to fill in the gap in the paragraph by the given words. The fourth task included two questions that should be answered from the text. In task five, the students were asked to find out the words. Task six was about finding in the text words closest in meaning to the given words, and also to find the opposites in meaning to the words. The seventh task was about identifying the purpose of the words in bold in the given text. The last task aimed to integrate the reading and writing skills together. It was about paraphrasing the third paragraph of the text. The proficiency test was a complement to the questionnaire. The proficiency test aimed to explore these PhD students English language proficiency, evaluate their overall competence in English, and detect their difficulties while extracting the ideas from the text.

3.2.4.2 *Piloting and Validation* To make this test ready and final for, use the validation phase was essential. The proficiency test was sent via emails to two teachers specialised in the field of English for specific purposes and teachers in our University for validation and a review of the questions, layout of the test, and to see wether the researcher followed the appropriate structure in designing a proficiency test, or not. The teachers agreed on the following remarks: The time allotted to answer should be written on the paper. And they agreed that the last task was suitable to integrate the reading and writing skills. Also, task two of matching words with their definitions is added as a result of the teachers' feedback and observations and the test was improved (See Appendix 2). Next, the researcher contacted the participants ahead of time about the proficiency test, which will be held in the Natural and Life Sciences department, in order to set a suitable date.

3.2.5 *Data collection procedures*

3.2.5.1 *Data collection procedures for the questionnaire* Before starting the data collection phase, the researcher visited the Department of Natural and Life Sciences, contacted the participants, and had a discussion about the topic and objectives of the study with them. The students liked the topic and were pleased that their issues with the English language were taken into consideration. Next, the questionnaire was submitted to the target group, the Phd students of Biology. The questionnaire was handed after getting the students written consents to participate in the study. The researcher explained the objective of the investigation and stressed that all the answers would be held in the strict confidentiality. She asked the participants to ask for any clarifications when needed. Twelve students were contacted and answered the questionnaire. For other four students , it was sent via emails with the consent letters.

3.2.5.2 Data Collection Procedures for the Proficiency Test In the second phase of data collection, the researcher designed a proficiency test. The researcher contacted the participants ahead of time about the proficiency test, which would be held in the Natural and Life Sciences Department in order to set a suitable date for them. The researcher asked the participants to find a classroom to sit for the test for two hours as this was the time allotted for answering the test. The day of the test, the researcher was informed about the room. Next, the test was distributed to 11 student who were present. The test took place in good conditions and in an academic atmosphere where the students were ready to answer the questions individually. The researcher asked the participants to ask about any clarifications when needed. Five students were unable to come to the university. That is why, the test was sent to them via emails to answer it.

3.2.6 Data Analysis Procedures

Since to the current investigation follows of a qualitative research approach, the data collected was by its nature of the qualitative type. A needs analysis questionnaire and a proficiency test were included. The latter test used in this study does not offer frequencies but rather supports the needs analysis questionnaire by collecting information about the students' English language proficiency level and their present needs in order to describe the phenomenon under inquiry, which is seen as the most appropriate analysis procedure in this situation. The current study also presents the information for easy understanding in the form of tables, pie charts, and graphs.

3.2.7 The Population and the Sampling Technique

Our population consisted in the doctoral students at the Natural and Life Sciences Department. More specifically, the sample of the current study was composed of second-year students of Biology. Their number was 16. We selected the second-year students because they

had already experienced reading scientific publications related to their field of study in English in their first year and are still facing challenges in reading comprehension in their second year. Therefore, this is something that needs to be investigated. The sampling technique used was the purposive sampling, which is a type of non-probability sampling. Purposive sampling means that to understand the phenomenon being investigated, the participants should be selected non-randomly. This is a direct match to our objectives. The researcher chose the participants with a purpose in mind, which is that they carry the characteristics needed in the sample.

Conclusion

In the present chapter, the researcher presented the theoretical background of the research methodology. Next, she also provided a justification of the rationale behind choosing a specific paradigm, design, or approach, as it allowed the readers of this study to understand the methodology selected. In addition, the next chapter attempts to a thorough discussion and analysis using a variety of graphs and tables to help readers fully understand this investigation.

Chapter Four: Fieldworkand Data Analysis

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Introduction

The primary goal of the current chapter is to present, interpret, and discuss the data and outcomes through data collection methods used with the second-year PhD Biology students at Biskra University. with a focus on having conscious of the needs, deficiencies, and potential goals of these students. This chapter also presents findings and provide an interpretation and explanation of the questionnaire and proficiency test. The questionnaire questions were gathered from various sources among them Samihi (2019). However, it is worth mentioning that some changes were made by the researcher to fit the current research objectives and aims.

4.1 The Results

In this section, the researcher attempts to present, discuss and interpret the results obtained from the needs analysis questionnaire, and proficiency test.

4.1.1 An Overview

4.1.1.1 The Questionnaire Analysis

As mentioned earlier, the questionnaire is one of the data collection tools used in gathering data to identify students' needs, lacks, and wants. The questionnaire comprised four sections (See appendix 1) and 11 question item.

4.1.1.2 Questionnaire results

- **Section 1: Background information**

Question 01: Fill in the blanks with information about yourself by inserting a tick mark in the provided space(s) or by answering the questions below.

The first item was intended to gather personal data about the participants, such as their gender and English language proficiency. The gender item indicates that there are more female respondents than male respondents. It is remarkable that females are more likely to study this field than males. It is also ostensible that a certain number of respondents evaluate themselves in English language proficiency as intermediate. The following figure illustrates these assumptions.

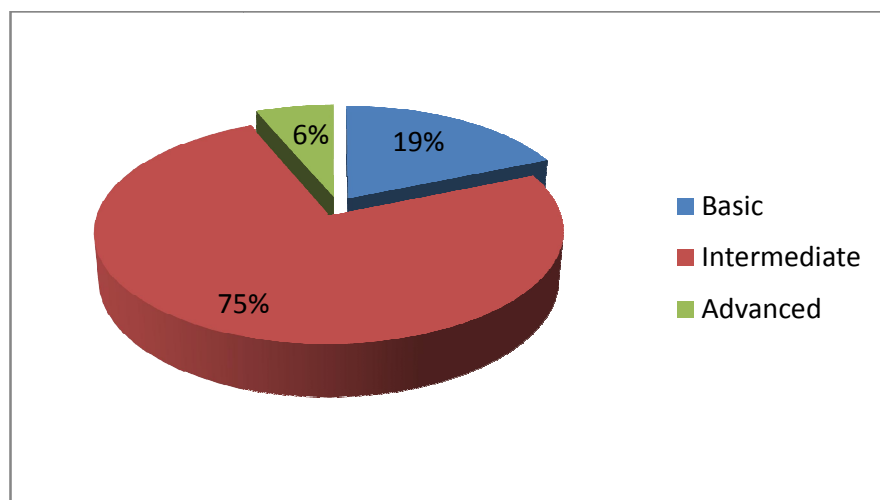


Figure 8: English language proficiency percentage.

As it is represented in the figure, most of the students are at the intermediate level; their percentage is 75% , which has a rationale behind it. That is, they already have some basics on the English language since they studied it in previous years (middle school, high school, and at the university level as a module). The percentage of students with a basic level is 19%, which may refer to their weakness in all levels of the English language (grammar, limited vocabulary, and so on). As for the percentage of students with an advanced level in English, it is 6%, which represents a very small number of students with a good level in this language.

In the third item, most students ticked the average level that represents their competence in reading English. In the last item in this section that is about their reason behind reading in English, some of the respondents chose the last option, which is to increase their background knowledge about my field because most of the works in our field are written in English. Some of them justified this choice by stating that English is an international language and the majority of scientific studies are published in English. Furthermore, because English is the most commonly used language in the field of Biology. it is important to publish in English Scientific publications written in English are more readable and quoted. Others stated that an acceptable level of English is needed at the PhD level. Thus, nowadays, scientific publications generally rely on the English language and are characterised by deep and valuable information. In addition, all databases, such as ResearchGate and Google Scholar, support scientific publications are written in English.

- **Section 2: Needs Analysis**

A- Students' General Needs:

Question 02: Why would you need English?

The second section aims to identify students general and academic needs. In general needs, it includes three options under the question why they would need English, for exploring webpages, or for survival English, or for reading. A considerable number of answers were between exploring webpages and reading, which indicate that the students need to explore webpages searching for knowledge and also read to cope with their study and to be more knowledgeable about their field.

Question 03: Please arrange these language skills based on the significane they present to you?

In the students' academic needs' item, in which they are asked to rank language skills and begin with the most crucial skill for them, the responses showed that most of them ranked reading as the most important skill, followed by writing as the second most important skill. Then, the third skill is speaking, and the last one that is listening. This shows that there is a logical rationale behind ranking reading as the first most important skill because, at the PhD level, students may study a different specialty from the one studied at undergraduated level, thus, they read to develop their background knowledge and information. It is worth mentioning that they used to read in French, and they started reading scientific publications in English in order to store the maximum amount of new vocabulary and technical vocabulary in English in order to use them when they write their own productions. The following figure illustrates the ranking language skills.

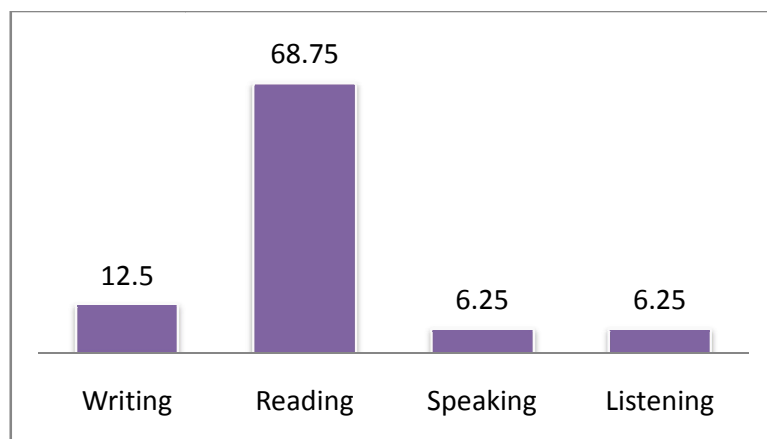


Figure 9: Ranking the language skills according to their importance.

This figure shows that some students viewed the reading skill as the first most important skill, which is also regarded as the source of information and knowledge. The second ranked language skill is writing. This indicates that they are aware that the most readable and quoted publications are written in English language. For the listening and speaking skills, the latter have the same ranking mainly. This means that they have less

importance than reading and writing. in this respect, PhD students are required to read publications and generate their owns scientific publications ones.

Question 04: What competences are necessary for learning English? In:

- Academic reading competences

For the fourth item on the students' academic needs, the students were asked about the skills that are necessary for learning English. To be more specific, we prioritised the academic reading and academic writing . Firstly, academic reading competences are followed by three options that indicate the necessary competences that enable them to learn English language. Most respondents chose the first option, which is reading books or journals in their specific field. This indicatethat they are in need of English related to their fields of study to make sense of learning and reach their goals. Rather than reading general English far from their speciality, they are aware that this cannot be sufficient in enhancing their background information or learning specific English related to Biology. A small number of students chose the second option because they saw that recognising the core idea of the text is necessary to learn the target language. Thus, having a general idea about what a science text is about, enhances their comprehension. This assumption is represented below:

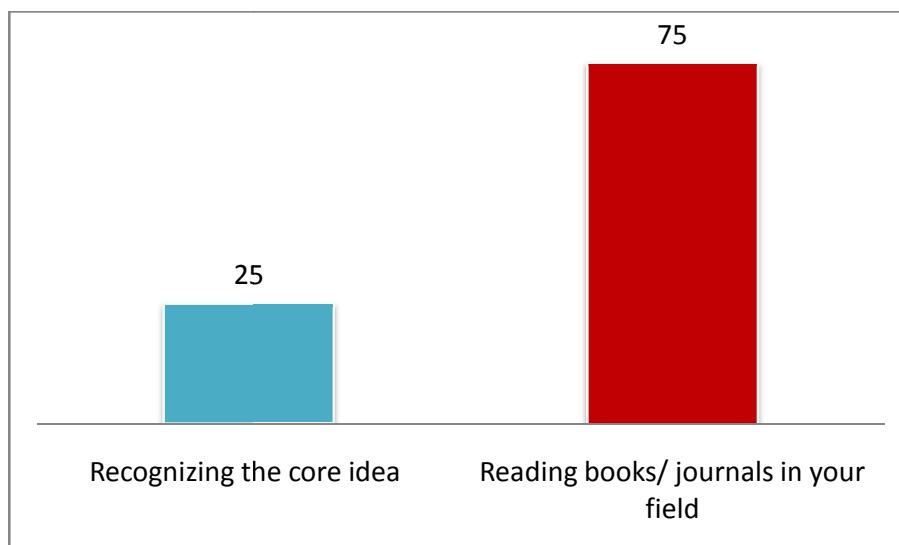


Figure 10: Demanding tasks in reading for PhD students of Biology

As it appears above, 75% of the students responded that in order to enhance their background knowledge in their field, reading books and journals in their field is essential. On the other side, 25% of these students believed that understanding the text's core idea is crucial to learning English.

In the sub-part of reading competences that aims at gathering information concerning the students' reading comprehension difficulties when they read English texts, the question was design based on four options: Smooth reading with comprehension, Slow and intermittent reading with little comprehension, Slow and intermittent reading with comprehension, or Slow intermittent reading with comprehension. The majority of students chose the last option, which is slow reading with difficulty and little comprehension. This tells that they face challenges in reading English texts, although they are aware of the importance of the reading skills in enhancing their level. Yet, the lack of reading practice increased the gap. They said that the English lessons they received at the university level were general and not related to Biology, which has led them to lose their passion for the language. Teachers also did not take into account the students specific goals that build a solid background in English. The following table explains these findings clearly.

Table 1

Level of difficulty in reading with comprehension.

Reading comprehension of students	Rate
Smooth reading with comprehension	6.25 %
Smooth reading with little comprehension	18.75 %
Slow, intermittent reading with comprehension	12.5 %

Slow, intermittent reading with difficulty and little comprehension	62.5 %
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This finding reveals that the majority of students have difficulties with reading comprehension. Thus, while reading, they read slowly, intermittently, with difficulty, and with little comprehension. Their percentage is 62.5%. This percentage elicits their limited exposure to English texts and English vocabulary, which raises their difficulties of comprehension and weakens their background in English. Furthermore, because they have dealt previously most with French texts in the past five years, Yet, the English language is only for publication purposes or for varying ideas from different sources. Also, their carelessness in the English language increases the gap and the problem. The percentage of students who choose the option of smooth reading and little comprehension is 18.75%. This implies that an acceptable number of students compared to the sample size can read, yet the issue is in understanding. This lack of understanding may refer to the fact that they cannot extract the needed information from the text, cannot make a logical connection between the ideas, or cannot understand what certain words mean or refer to, et cetera. And 12.5% of students read in slow and intermittent with comprehension. Those students can understand the text ideas. Yet, their difficulty is with words reading. They cannot read smoothly since they are not used on reading English texts, they understand technical vocabulary related to their field that are key words in the text, or words similar in spelling to French . Hence, they guess the meaning and pronunciation. 6.25% is the percentage that represents the students who can read smoothly with comprehension. The latter is a very small number compared to the students total number.

- Academic writing competences

Secondly, the last subpart of the fourth item is about academic writing competences, which is followed by three options about its necessities in learning English, which can be writing English for academic purposes (EAP) reports and essays, writing scientific articles for publications, or the necessity of grammar and vocabulary. The majority of students showed that writing scientific articles for publications and their need for that is crucial. They think that writing skills are important and needed. Some of them choose the option of writing English for academic purposes in reports or essays, which indicates their interest and their necessity for writing specific kinds of academic texts. Some of them ticked the last option, which is grammar and vocabulary. These are regarded as necessary in both writing and the core of learning English, see the figure below.

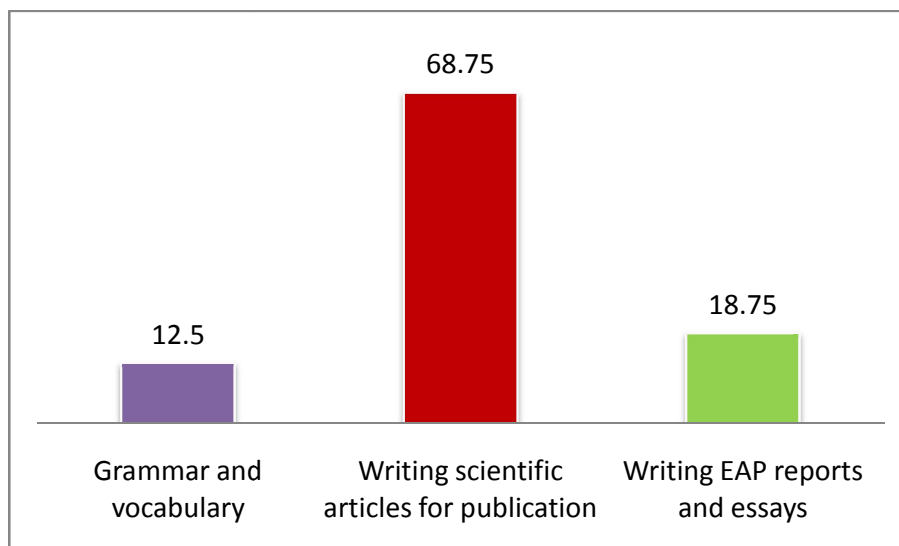


Figure 11: Demanding tasks in writing for PhD students of Biology

The collected data revealed that 68,75% of students saw that writing scientific articles for publication is the most important. And this large percentage reflects their need for this competence. 18,75% of students viewed writing EAP reports and essays as essential. 12,5% of students believed that grammar and vocabulary are necessary to learn English language.

Question 05: Why would you need English in the future?

The last item in the needs analysis section is about the potential expectations. The aim of this item was to identify students' target needs for the future through the question of why they would need English in the future. Most respondents ticked the first option, that is reading specialisation written or printed materials. That is, they target that their future goals in English is what they want to achieve in the future. Also, this item indicates their real need for having an acceptable level of reading comprehension and overcoming the challenges. Some of them chose the second option, which is to be able to translate English for academic purposes from Arabic to English or from French to English because the most readable language is English. Some of them ticked the option of translating articles and reports as a future goal to understand English and enhance their level for a successful academic career.

Table 2

Students target needs

Target Needs	Rate
Reading specialization written or printed materials	50 %
Translation of EAP materials from Arabic to English or from french to English	31.25 %
Translation of articles and reports	18.75 %

The findings revealed that for 50% of the students in the sample, their target needs and future goals are to be able to read specialisation written or printed materials. However, 31 % of students showed that their target needs that they desire to achieve is to be able to translate English for academic purposes from Arabic to English or from French to English. On a

different note, 18% of students wanted to be able to translate articles and reports, which reflects their potential to master and learn the English language.

Section 3: Learners' language skills self evaluation

Question 06: How do you evaluate your proficiency in English language skills?

- **Speaking**

By presenting these options (Weak, Average, Good, Very Good, Excellent), the researcher sought to more precisely define the language proficiency level of the learners in the speaking skill. A considerable number of students ticked the average level. Their number was 13 with a percentage of 81.25%. Two students with a percentage of 12.5% ticked a weak level in speaking skills, and only one student ticked a good level with a percentage of 6.25%. No student chose a very good or excellent level. See the table below.

Table 3

Students speaking skill level.

Level	Weak	Average	Good	Very good	Excellent
Number	2	13	1	0	0
Percentage	12.5%	81.25%	6.25%	0%	0%

81.25% of students have average speaking ability. Some have a weak capacity. And 0% of these students have not a very good or excellent level. The data also reflected that they do not use language as a means of contact in academic or also their non-academic contexts. This result their limited speaking background and limited vocabulary.

- **Listening**

As demonstrated by the following table, more than half of the students chose the average level in the listening skill, while a small minority with weak level. Some are with good level. Two students are in the very good range; and none from our sample have an excellent level.

Table 4

Students listening skill level.

Level	Weak	Average	Good	Very good	Excellent
Number	2	9	3	2	0
Percentage	12.5%	56.25%	18.75%	12.5%	0%

This findingshows that the majority of students have an average level of listening skill,which may be the result of their limited exposure to English and their inability to recognise particular words or their pronunciation.

3. Writing

Regarding the students' writing skill level,a considerable number of students ticked the average level. Some of them ticked the weak level, and the same number of students scored at good and very good levels. For the excellent level, only one student scored.

Table 5

Students writing skill level.

Level	Weak	Average	Good	Very good	Excellent
Number	3	8	2	2	1

Percentage	18.75%	50%	12.5%	12.5%	6.25%
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As shown in the table, 50% of the students have an average level. Also, they have the same level in writing in the English language despite that writing is one of the most important skills in the EAP context and specifically for PhD students. Clearly, they have a weak background in this skill. 18.75% of students have a weak level in writing, which indicates their lack of practice in writing in English. 12.5% of students are at a good level in writing. The same percentage is at a very good level, and one student from the whole sample is at an excellent level. Overall, one can conclude that with regard to the significance of the writing skill in the English language and in an academic context, students should focus more on enhancing their level to have a successful academic career.

- **Reading**

About the reading skill, the researcher aimed to collect information about the students' level in this skill by presenting these levels (Weak, Average, Good, Very Good, and Excellent). 50% of the students ticked the average level, and five students from the total number of 16 in the sample have a good level of reading skill. The same number of students ticked weak, very good, and excellent, with only one student for each.

Table 6

Students reading skill level.

Level	Weak	Average	Good	Very good	Excellent
Number	1	8	5	1	1
Percentage	6.25%	50%	13.25	6.25%	6.25%

As shown in the table, the results indicate that the majority of students have an average level of reading, which may result from the obstacles they face while reading English texts, such as the difficulty in word recognition, poor comprehension, a lack of vocabulary knowledge, and their difficulties in grammar. 13.25% are good, which reflects their acceptable level of the reading skill, in which they can read and comprehend some technical vocabulary related to their field.

To sum up, one can deduce that the level of students in all the language skills is at average level. Thus, more than half of these students are at average level in the four skills. This reveals that our sample needs to enhance the English language skills in the four skills. This implies that speaking and listening are less important than writing and reading, and that it is clear that students are concentrating on reading and writing skills more than the other skills.

- **Section 4: Learners' Perceptions towards English**

Question 07: How was your attitude towards English language learning at the beginning of your studies?

In the fourth section, the researcher purposely designed questions that aim to collect the learners' perceptions towards English language through the question, "How is the student attitude towards English language learning at the beginning of their studies?" Or, in other words, their attitudes towards English language in the past few years before reaching PhD level. The majority of students expressed their positive perceptions in English and answered by yes. It is important. A small number of students only consider English as not an important language.

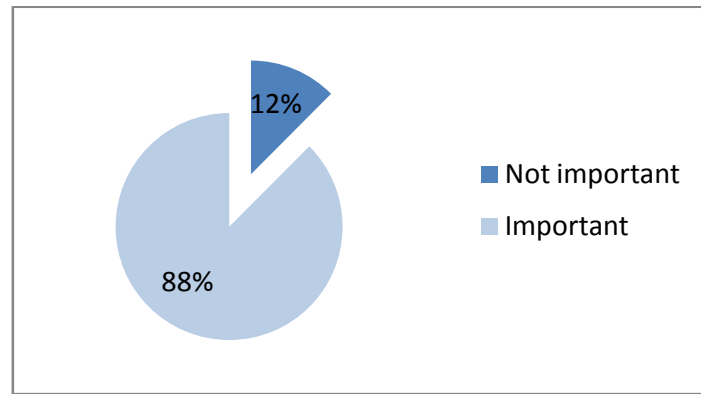


Figure 12: Students perceptions towards English language.

The findings revealed that most students (90%) showed the significance of English language for them and had positive attitudes. This indicates their positive motivation towards English language learning. At the same time, this can also reflect their current need for the English language, and their positive perceptions may help them and give a sign to teachers to teach them and enhance their level. However, some of them, with a percentage of 10%, rated English as not an important language. This may be due to their weak background, which influences their attitudes.

Question 08: What are the reasons of your weaknesses in English? How might your English be improved?

The second item, in this section, tries to understand the reasons for the students' English proficiency gaps and how it may be filled. Diverse students provided diverse responses to this question. Some argued that this weakness is the result of the incomplete knowledge they learnt from English classes. In fact, this general English had nothing to do with scientific English. Others claimed that it was due to their poor reading and the lack of communication practice in English, and that their preference for the French language over English, and English language course was only motivated by the need to pass examinations. However, several students responded to the question by highlighting their own needs and

weakness, including the difficulties in understanding what they read in the English language, issues with grammar, and issues with vocabulary. Some of them mentioned the difficulty of communicating and speaking in English, as well as the challenges they encountered when paraphrasing English materials.

To improve their English language level, these students were asked about their opinions and suggestions to improve their own level in English. The students wanted to have regular lessons on scientific English related to their field, Biology, which is related to their needs and priorities. Some of them said that their level can be improved by reading a large number of articles and books in a regular manner and enrolling in private schools for learning specific English (English for Biology). Addedly, their level can be improved through attending lectures in scientific English online and practicing listening to the English language.

Question 09: Can you understand a scientific article or a book in your specialty in the English language without using translation?

The third question in this section was about the translation process. They were asked if they could understand a scientific article or a book in their specialty without using translation, and the majority of students answered by no. They could not understand without using translation.

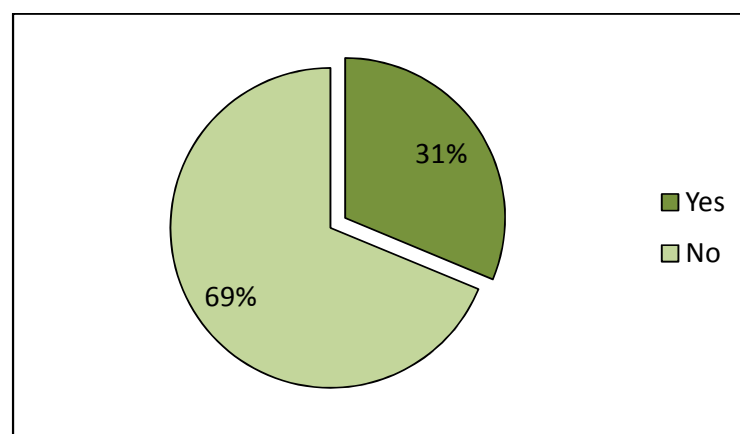


Figure 13: The use of translation procedure for comprehending science materials.

It is observable that a considerable number of students (69%) are using translation to understand a scientific article or a book in their specialty. This indicates their gaps in reading comprehension and their inability to understand English science texts, only a small number of students (31%) answered by Yes. They understand science texts and technical vocabulary

Question 10: Do you have scientific books in English language on your computer and do you read from time to time?

The fourth question in this part inquires about the students' reading habits in order to determine whether this is the cause of their poor comprehension of science materials. The researcher asked the participants whether they had any English-language scientific books on their computer and if they regularly read them or not. The researcher also specified that they have them on their computer because articles and books are available online, and they are required to vary their sources when writing. In this regard, Most students responded positively to this question by saying they have books and articles in English related to their field, but some students gave negative answers.

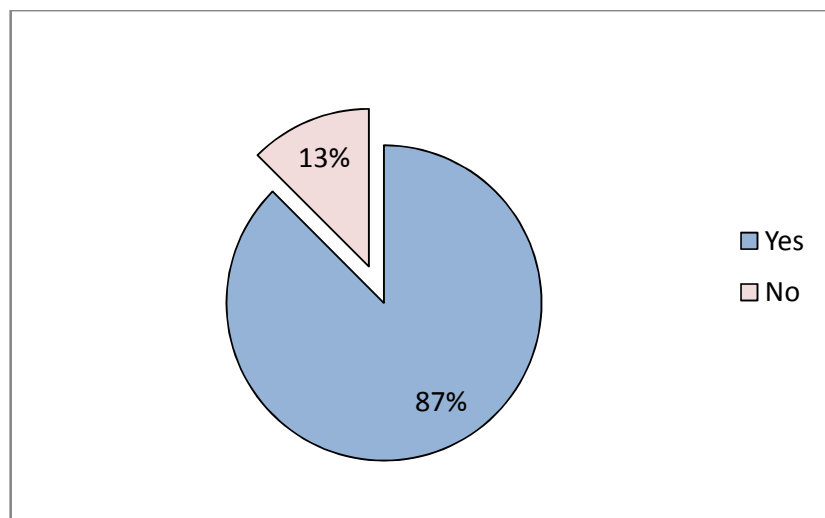


Figure 14: Reading habits of students.

The majority of students (87%) had English-language materials on their computers, as indicated in the pie chart. However some of them (13%) responded negatively, claiming that they do not routinely read from any English-language resources (articles or books). This suggests that one of the factors contributing to their poor understanding is the lack of reading experience and English language exposure. The regularity with which they read these English-language books is a sub-part of this inquiry. Various responses were obtained, and the majority of them do not read frequently, which may reflect poorly on their reading habits.

Question 11: Do you use the translator at first sight when reading an article or a science book? If yes, what percentage of translation.

The last question in this section attempted to determine how much a students depends on the translation process and comprehension level. When reading an article or a science book, they were asked if they always use the translator. And if so, what percentage of the text deserves to be translated. The students were also asked to respond using the percentages given (100%, 50%, 25%, and 75%) based on their personal experiences. This is shown in the following table:

Table 7

The extent to which students use translation

Extent of translation	Number of students
Translation of whole text 100%	0
Translation of half of the text 50%	7
Translation of quarter of the text 25%	5
Translation of a part of the text 75%	4

The results indicate that seven students from our sample translated of the text in order to understand it. Five students translated of the text, and four students translated of the text in order to acquire its ideas, which shows that they have a poor understanding of the content. No student in our sample completely translated the material.

4.1.2 The Proficiency Test Results

The current study uses a proficiency test to collect data regarding the students English language proficiency levels. It is important to note that this proficiency test was not used alone, but rather as a supporter to the questionnaire. Both of these data collection methods sought to determine the reading comprehension needs, lacks, and wants of students, as well as the state of the English language at the Department of natural and life sciences. Furthermore, to identify their background knowledge in their speciality, and vocabulary knowledge, we selected a scientific text entitled "Cells under the Microscope" and tasks about reading comprehension and mastery of language. To analyse students levels, we adopted the EF set scoring system for the proficiency test since it sets out six levels of foreign language mastery (A1 Beginner, A2 Elementary, B1 Intermediate, B2 Upper intermediate, C1 Advanced, and C2 Proficient) in order to describe English language proficiency. The following table illustrates best this scoring system.

Table 8

Distribution of students according to their English language levels.

Score	Level of English proficiency	Students number	Percentage	Total
[1-5]	Beginner (A1)	1	6.25%	16 (100%)

[6-10]	Elementary	7	43.75%
	(A2)		
[11-15]	Pre-intermediate	8	50%
	(B1)		
[16-19]	Upper- intermediate	0	0%
	(B2)		

The results demonstrated that the vast majority of the students in the sample have an elementary and pre-intermediate level in English language. In simple terms, they have a difficulty in reading and understanding science texts. The findings revealed their limited English language proficiency and background. Yet, this level can be improved to reach the needed level in English language. Overall, the level of students' English language proficiency ranged from beginner ($n = 1$) with a rate of 6.25%, elementary ($n = 7$) with a rate of 43.75%, pre-intermediate ($n = 8$) with a rate of 50%, and no student with upper-intermediate. It is significant to note that because the researcher was aware of the students' English proficiency levels, advanced and proficient levels were not included in the levels chosen. As a result, several modifications to the EF set scoring system were made in consideration of our sample size and level.

In conclusion, it can be deduced that all of the data stated above come together to prove that students understanding of science text depends on having background knowledge. According to Rumelhart (1980), Schema theory is a justification for how readers understand and gain knowledge from texts by relying on prior knowledge. Yet, according to the proficiency test results, the vast majority from our sample had difficulty in comprehending science texts due to the lack of previous knowledge that negatively affects students' reading comprehension and

reading performance. It is worthy mentioning that the absence of prior knowledge is not a difficulty in itself. However, it is a problem that influence students academic performance. This gap can be filled by practising reading to build knowledge related to their of study.

It can be inferred from the students responses that they had issues with ESP vocabulary. The latter are most frequently used in scientific texts and have a tendency to be restricted to their area of study. The students asserted that they have trouble understanding technical terms when they are paired with more common English words rather than when they are used alone. It may also be the result of poor word recognition, which prevents one from understanding the meaning of the term. According to Dennis (2008), vocabulary influences the reading comprehension skills. This implies that poor comprehension often results from low-income vocabulary knowledge.

Additionally, the lack of a reading strategy might lead to problems with comprehension when reading. In other words, an absence of reading strategies may be the cause of the students difficulties in understanding what they read. The latter make it simpler to get a general understanding of the text and allow readers to infer meaning from it. It is important to note that implying reading strategies call for the reader to be conscious of them since they improve decoding and comprehension.

5.1 Synthesis of the findings

The following synthesis on the students' challenges with reading comprehension in an academic context in English can be drawn from the discussion of the findings.

In an EAP setting, the students in our sample have a trouble understanding of science texts. To reach their objectives and achieve a successful career, these students need to be proficient in essential skills. To acquire the necessary English-language information for their

chosen field, reading is among the most crucial skills. For biology PhD students in the Natural and Life Sciences Department, there are currently issues with the reading comprehension, as well as needs, lacks, and wants. It is important to note that the obstacles to reading comprehension usually come from various sources that are mainly grammar, and vocabulary .

Firstly, the needs analysis section in the questionnaire tried to determine the needs, lacks, and wants of the students. According to the results, students must be able to understand science books because the research they are investigating requires them to gain information about it in order to get the expected outcomes. They demonstrated that reading is the most prioritised skill. They currently have trouble understanding about what they have read this usually results from the different sources. This assumption confirms that the second hypothesis which asserts that the difficulties in reading skills are caused by different factors involving problems in language knowledge, which consist of vocabulary and grammar and usage. And some others are due to difficulty of reading with comprehension.

Students were also taught in French language for the past five years, which has reduced their prior knowledge of the English language. This confirms the first hypothesis that since these students have most of their modules taught in French, their need for English is not fully apparent. The latter leads us to assume that their needs are not taken into consideration, because the French language dominates science domains of study in Algeria. On the other hand, the students' desired needs include having the capacity to understand the ideas, vocabulary, and grammar in science texts. Since acquiring the necessary background information is essential for advancing their academic and professional careers, they are also required to be knowledgeable enough in the language.

In briefe, we have gathered data on this topic in order to have a better picture of how students might improve their level of English. Students frequently recommend having regular

online English language sessions, practising ESP reading, and joining in private schools to study English in the Biology area, since these are some of the methods they believe are most appropriate for their condition and degree of proficiency. And this is with direct match to the third hypothesis that asserts that if Biology students specialised in English through an appropriate and well-designed curriculum, they would get accurate results and be able to publish valuable scientific articles and achieve global success.

Conclusion

In the current chapter, the researcher attempted to provide an analysis, a discussion, and an interpretation of the data obtained from an unstructured questionnaire and a proficiency test. In both of them, needs analysis was applied. The data were analysed descriptively. For a better interpretation of the collected data, a variety of graphs and tables were used. Additionally, from the discussion, it becomes clear that the research questions were answered and the formulated hypotheses were confirmed.

General Conclusion

Nowadays, English language is becoming increasingly essential. And this popularity touched also the academic and professional contexts. More specifically, all academic fields of study have become aware of its significance and valuable use. Due to this, the demand to learn English for specific purposes related to the ESP students has increased.

In higher education, ESP students are required to read English materials related to their own field of study in order to build knowledge about it, learn more technical vocabulary related to their domains, and eventually use this language knowledge in writing their own productions or for occupational purposes. However, they encounter different difficulties

regarding all aspects of the English language among challenges while reading ESP materials and, therefore, fail to become efficient readers.

The present study has provided an analysis of the situation of the second-year doctoral students of Biology at the Natural and Life Sciences Department in Biskra University regarding both their English language proficiency level and their needs, lacks, and wants, as well as their attitudes towards this target language. To achieve the main purpose of this study, the researcher adopted a qualitative approach, and a subsequent case study design. In relevance to this approach, we employed two data collection methods, a questionnaire for the students and a proficiency test, in order to collect the needed data.

Ultimately, the findings of this research demonstrated that the ESP students in the context under investigation, encountered many difficulties in the reading comprehension of English texts and could not cope with English materials due to their focus on French, which dominates science domains in Algeria more than English. Also, the research results sought to explain and find answers to the raised questions regarding the main challenges faced by students of Biology while reading, the needs of biology students, and how students of Biology would improve their English.

For the analysis of the obtained results from the data collection methods, it is remarkable that students need to learn specific English. In other words, in light of the above-mentioned results, one can deduce that if teachers followed a needs analysis procedure, they can identify students target goals, needs, and gaps and eventually find a way to overcome the difficulties and make sense of learning. Furthermore, their attitudes towards English will be positive because they are learning specific English that they need in their area of study. Thus, it provides suggestions, limitations, and recommendations to overcome difficulties of reading

comprehension and to raise the awareness of teachers regarding the needs analysis procedures to improve EAP learning.

Pedagogical Recommendations

The findings of this investigation contain numerous educational implications for both students and teachers. We propose some pedagogical recommendations based on the analysis findings in order to assist ESP students, in particular, in improving their reading comprehension and to make teachers more conscious of the process of conducting needs analysis for enhancing EAP training.

- Through our study and other previous studies that revealed the students' difficulties and gaps in reading comprehension that often result from various factors, ESP practitioners and course designers should take into account the doctoral students' Biology needs, lacks, and wants by designing a specific syllabus that should meet their demands that also can even be faced by other students in the academic context.
- Science texts require a deep comprehension of the ideas they present and their relationships in order to effectively understand what is being read. Thus, the students can be equipped with a variety of reading strategies that ease their process, including skimming, scanning, intensive reading, and extensive reading.
- Future research on this topic must be done for a thorough and consistent needs analysis process to be carried out on a large scale in the Natural and Life sciences Department. This will allow course designers to generate teaching materials that best match the needs of students.
- Students' motivation and willingness to practise reading and participate in various English reading assignments can be increased by becoming aware of the importance of ESP reading through teachers' recommendations.

- Since authentic materials assist ESP students in understanding the knowledge of language of a particular topic and technical terminology connected to the context in which it is used, they should be given preference over non-authentic ones.
- By planning regular sessions in a variety of techniques to present their courses using visual aids and technology that improve students' interest, teachers can help students become more well-versed in English and stop coping with translation.

Study limitations

There are some restrictions on the current investigation. The most essential ones are listed below:

- Our study has a certain limitation in terms of the sample size in which it was conducted, with a sample of 16 students of Biology in their second year in the academic year 2020 -2023 in the Natural and Life Sciences Department.
- Another limitation of this study was that it did not develop any courses that would best meet the needs of the target group and their intended objectives. Instead, it described the difficulties that Biology students had with the reading comprehension, applied the needs analysis procedures to gather information, and evaluated students' attitudes towards the English language.

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Appendix 1: Needs Analysis Questionnaire

Mohamed khider university of Biskra
Literature

Department of English Language and

Questionnaire for Biology Students

The present questionnaire is part of "**a Master Dissertation**" conducted to investigate the needs of Second Year Doctoral Students of Biology at Biskra University in terms of comprehension when reading in English. I would like to understand from students about what they need to learn and how they should be taught. This feedback will be used to plan future courses and teaching materials for Biskra University students. The researcher highly appreciates your assistance by completing this questionnaire. Your answers is of great value to the research. You are kindly requested to put a tick to indicate your chosen option. Rest assured that all answers will be held in the strict confidentiality. Please fill it out and give it back to researcher.

Section One: Students' background information

Question 01: Fill in the blanks with information about yourself by inserting a tick mark in the provided space(s) or by answering the questions below.

1- Gender:

1. Male

2. Female

2- How do you evaluate your overall competence in English language?

1. Basic

2. Intermediate

3. Advanced

3- How do you consider your competence in reading English texts?

1. Very good

2. Good

3. Average

4. Poor

5. I do not know

4- Why do you read in English language? (you can choose more than one option)

1. To enrich the vocabulary repertoire

2. To improve grammatical competence

3. To increase my background knowledge about my field

4. All of them

Justify your choice

.....
.....

Section Two:Needs Analysis

A-Students' General Needs

Question 02: Why would you need English language?

Because:

1. To explore webpages

2. For survival English(abroad)

3. For reading

B- Students' Academic Needs

Question 03: Please arrange these language skills based on the significane they represent to you?

- Grade them from 1 to 4.(Begin with the most crucial).

1. Listening

2. Speaking

3. Reading

4. Writing

Question 04: What competences are necessary to learn English language? In:

- Academic reading competences

- 1. Reading books/ journals in your field
- 2. Recognising the core idea
- 3. Others, please specify

.....
.....

- Academic writing competences

- 1. Writing EAP reports and essays
- 2. Writing scientific articles for publication
- 3. Grammar and vocabulary
- 4. Others, please specify

.....
.....

C- Potential expectations

Question 05: Why would you need English language in the future?

- 1. Reading specialisation written or printed materials
- 2. Translation of EAP materials from Arabic to English or from french to English
- 3. Translation of articles and reports

Section Three: Learners' language skills self evaluation

Question 06: How do you evaluate your proficiency in English language skills?

- Speaking:- Listening:

- | | | | |
|--------------|--------------------------|--------------|--------------------------|
| 1. Weak | <input type="checkbox"/> | 1. Weak | <input type="checkbox"/> |
| 2. Average | <input type="checkbox"/> | 2. Average | <input type="checkbox"/> |
| 3. Good | <input type="checkbox"/> | 3. Good | <input type="checkbox"/> |
| 4. Very good | <input type="checkbox"/> | 4. Very good | <input type="checkbox"/> |
| | <input type="checkbox"/> | | <input type="checkbox"/> |

5. Excellent

5. Excellent

- Writing:

- Reading:

- 1. Weak
- 2. Average
- 3. Good
- 4. Very good
- 5. Excellent

- 1. Weak
- 2. Average
- 3. Good
- 4. Very good
- 5. Excellent

Section Four: Learners' Perceptions towards English Language

Question 07: How was your attitude towards English language learning at the beginning of your studies?

- 1. Important
- 2. Not important

Question 08: What are the reasons of your weaknesses in English language? How might your English be improved?

.....

.....

.....

Question 07: How was your attitude towards English language learning at the beginning of your studies?

- Important
- Not important

Question 08: What are the reasons of your weaknesses in English? How might your English be improved?

.....

.....

.....

Question 09:

Can you understand a scientific article or a book in your specialty in the English language without using translation?

Yes

No

Question 10:

Do you have scientific books in English language on your computer and do you read from time to time?

Yes

No

How many times a week do you read it?

.....
.....

Question 11: Do you use the translator at first sight when reading an article or a science book? If yes, what percentage of translation:

100%

50%

25 %

75%

Thank you for your co-operation

Appendix 2: Needs Analysis Questionnaire Translated to French Language

**Université Mohamed Khider -Biskra-
Département d'anglais**

Questionnaire destiné aux Doctorants en biologie

Le présent questionnaire fait partie d'un mémoire de master élaboré en vue d'étudier les besoins en termes de compréhension des documents écrits en langue anglaise chez les doctorants inscrits en deuxième année biologie à l'université de Biskra. Il s'agit d'identifier leurs besoins langagiers et tâcher de trouver la démarche à mettre en œuvre afin de combler leurs lacunes. Il est à noter que c'est à la lumière des résultats obtenus de cette recherche que nous allons tenter d'élaborer des cours et choisir le matériel pédagogique approprié pour une meilleure formation des doctorants de l'université de Biskra. Nous apprécierons votre collaboration, qui sera d'un grand apport pour notre recherche. Ainsi, nous vous prions de bien vouloir répondre à ce questionnaire, dont les résultats seront traités d'une manière anonyme et exploités pour des raisons purement scientifiques.

Première partie : Profil du doctorant

Question 01 : Mettez une croix dans la case qui correspond à votre réponse

1- Sexe : Mâle Femelle

2- Comment évaluez-vous votre compétence en langue anglaise ?

Débutant Intermédiaire Avancé

3- Quel est le niveau de votre compétence de compréhension de l'écrit en anglais ?

Très bien Bien moyen basique

4- Pourquoi vous lisez en anglais ? (Vous pouvez choisir plusieurs réponses)

- Pour enrichir mon lexique

- Pour promouvoir mes compétences grammaticales

- Pour approfondir mes connaissances dans mon domaine

- Parce que la majorité des recherches dans mon domaine sont publiées en anglais

Justifiez votre choix :

.....

.....

Deuxième partie : Analyse des besoins

A- Les besoins généraux des doctorants

Question 02 : Pourquoi avez-vous besoin de la langue anglaise ? Pour :

- 1- Explorer les pages Web
- 2- Se débrouiller dans des situations quotidiennes
- 3- Faire de la lecture.

B- Les besoins Académiques des doctorants

Question 03 : Veuillez mettre en ordre ces compétences linguistiques en fonction de l'importance qu'elles représentent pour vous. Classez-les de 01 à 04, en commençant par celle que vous jugez la plus essentielle.

- Compréhension de l'oral
- Production de l'oral
- Compréhension de l'écrit
- Productiondel'écrit

Question 04 : Quelles sont les compétences nécessaires pour apprendre l'anglais ?

1- La compétence de compréhension de l'écrit :

- 1- La lecture des livres / revues scientifiques dans votre domaine
- 2- Reconnaître l'idée centrale
- 3- Autres (précisez!) :
-

1.1. Lorsque vous lisez des textes en anglais, vous :

- 1. Lecture fluide avec compréhension.

2. Lecture fluide avec peu de compréhension.

3. Lecture lente et intermittente avec compréhension.

4. Lecture lente et intermittente avec difficulté et peu de compréhension

2- La compétence de production de l'écrit :

1- Rédiger des essais et des rapports EAP

2- Rédiger et publier des articles scientifiques

3- Grammaire et vocabulaire

4- Autres (précisez !) :

C- Des attentes potentielles :

Question 05 : Pourquoi auriez-vous besoin de l'anglais à l'avenir ?

1- La lecture des documents de spécialité écrits ou imprimés

2- Traduire les documents EAP de l'arabe vers l'anglais ou du français vers l'anglais

3- Traduire les articles et les rapports.

**Troisième partie : auto-évaluation des
compétences
linguistiques des doctorants**

Question 06 : Comment évaluez-vous votre maîtrise de la langue anglaise ?

- Production de l'oral- Compréhension de l'oral

Débutant

Débutant

Moyen

Moyen

Bien

Bien

Très bien

Très bien

Excellent

- Production de l'écrit

Débutant

Moyen

Bien

Très bien

Excellent

- Compréhension de l'écrit

Débutant

Moyen

Bien

Très bien

Excellent

Quatrième partie : Perception des doctorants vis-à-vis de l'anglais

Question 07 : Quelle était votre attitude envers l'apprentissage de l'anglais au début de votre parcours ?

- Important- N'est pas important

Question 08 : Quelles sont vos lacunes en matière d'anglais ? Comment pourriez-vous améliorer votre niveau ?

.....

.....

.....

.....

Question 09 : Pouvez-vous comprendre un article scientifique ou un livre dans votre spécialité en langue anglaise sans utiliser de traduction ?

Oui

Non

Question 10 : Avez-vous des livres scientifiques en langue anglaise sur votre ordinateur et les lisez-vous de temps en temps ?

Oui

Non

Combien de fois par semaine le lis-tu ?.....

Question 11: Utilisez-vous le traducteur à première vue lors de la lecture d'un article ou d'un livre scientifique ? Si oui, quel pourcentage de traduction:

100%

50%

25 %

75%

Merci de votre collaboration

Appendix 3 : Proficiency Test

Departement of English Language

Proficiency Test for Second Year Doctoral Students of Biology. **TimeAllotted:**
2hours

Text:

Score:..../**20**

Cells under the microscope

Cells were not made visible until the seventeenth century,when the microscope was invented. For hundreds of years afterward, all that was known about cells was discovered using this instrument.

The light microscope allows us to magnify cells up to 1000 times and to resolve details as small as $0.2\mu\text{m}$ (a limit ationimposed by the wavelikenatureoflight,notbyth equality of the lenses).Three things are required for viewing cells in a light microscope. First,a bright light must be focused on to the specimen by lenses in the condenser. Second, the specimen must be carefully prepared to allow light to pass through it. Third, an appropriate set of lenses (objective and eyepiece) must be arranged to focus an image of the specimen in the eye.

The transmission electron microscope (TEM)is in principle similar to a light microscope, but **it** uses a beam of electrons instead of a beam of light, and magnetic coils to focus the beaminstead of glass lenses. The specimen, **which** is placed in a vacuum, must be very thin. Contrast is usually introduced by staining the specimen with electron-dense heavy metals that locally absorb or scatter electrons, removing them from the beam as it passes through thespecimen. The TEM has a useful magnification of up to a million-fold and can resolve details as small as about 1n min biological specimens.

In the scanning electron microscope (SEM), the specimen,which has been coated with a very thin film of a heavy metal, is scanned by a beam of electrons brought to a focus on thespecimen by magnetic coils that act as lenses. The quantity of electrons scattered or emitted asthe beam bombards each successive point on the surface of the specimen is measured by thedetector, and is used to control the intensity of successive points in an image builtup on a video screen. The microscope creates striking images of three-dimensional objectswith great depth of focus and can resolve details down to somewhere between 3 nm and 20nm,depending on the instrument.

These and other forms of microscopy remain vital tools in the modern cell biology laboratory, where they continue to reveal new and sometimes surprising details about the way cells are built and how they operate.

Alberts Bruce and seven others (2013), Essential Cell Biology, (4th ed.). Garland Publishing.

Task 01: Read the text and answer with "True" or "False". (2pts)

1- Cells were made visible before the seventeenth century.....

2- The light microscope allows us to resolve details as small as 0.2µm.....

Task 02: Match the following statements (a, b and c) with the correct answer. (3pts)

- | | |
|--|--|
| a. The transmission electron microscope. | 1. In this type of microscope, an appropriate set of lenses must be arranged to focus an image of the specimen in the eye. |
| b. The light microscope. | 2. The specimen acts as lenses. |
| c. The scanning microscope | 3. The microscope creates striking images of three dimensional objects. |

Task 03: Fill in the gap with: (laboratory-significant-details) (3pts).

There are several forms of microscope that remain.....in modern cell biology....., where they reveal.....cells.

Task 04: Answer the following questions according to the text: (2pts) A. What are the components of light microscope?

.....
.....
.....

.....
.....

B.What is the difference between transmission electron microscope(TEM)and scanning electron microscope (SEM)?

.....
.....
.....
.....

Task 05:Who or what do the words in bold in the text refer to?(1pts)

It:..... Which:.....

Task 06:

a-Find in the text a word closest in meaning to(2pts)

-Planned=..... -Suitable=.....

b-Find in the text a word opposite in meaning to(2pts)

-Dark≠ -Prevent≠.....

Task 07: what is the purpose of the words in bold in this extracts from the passage?(1.5)

The transmission electron microscope (TEM) is in principle similar to a light microscope,**but** it uses a beam of electrons **instead** of a beam of light, **and** magnetic

coils to focus the beam instead of glasslenses.

.....
.....
.....
.....
.....

Task 08: paraphrase the third paragraph of the text.(3.5pts)

.....
.....
.....
.....
.....

Appendix 4: Validation Form of the Questionnaire

University Mohamed Khider –Biskra

Departement of English Language

Validation Form of the Questionnaire

I hereby certify that I have read the student test in the study carried out by Sabrina LAMOURI who is presently working on her MA dissertation at Biskra University. I have provided the researcher of this study regarding detecting learners' difficulties in reading comprehension in English for academic purposes context with remarks and comments concerning the layout, as well as the contents of the questionnaire.

Background Information on the Expert:

Name:

University:

Present Occupation:

Degree:

Email Address:

Signed:

Researcher Contact Details:

Sabrina LAMOURI

Email: srina6176@gmail.com

Mohamed Kheider University of Biskra

Faculty of Letters and Foreign Languages Department of Foreign Languages

Section of English

Appendix 5: Validation Form of the Test

University Mohamed Khider –Biskra

Departement of English Language

Validation Form of the Test

I hereby certify that I have read the student test in the study carried out by Sabrina LAMOURI who is presently working on her MA dissertation at Biskra University. I have provided the researcher of this study regarding detecting learners' difficulties in reading comprehension in English for academic purposes context with remarks and comments concerning the layout, as well as the contents of the questionnaire.

Background Information on the Expert:

Name:

University:

Present Occupation:

Degree:

Email Address:

Signed:

Researcher Contact Details:

Sabrina LAMOURI

Email: srina6176@gmail.com

Mohamed Kheider University of Biskra

Faculty of Letters and Foreign Languages Department of Foreign Languages

Section of English

Appendix 6: Participant Informed Consent

Mohamed khider university of Biskra

Department of English Language

Participant Informed Consent

Informed Consent

Dear Participant,

I am conducting a research study in which you are kindly asked to participate in. Aiming to help you take a decision on what concerns your participation, this letter attempts to briefly explain what the study is about, the tasks you are required to do, and the rights you have as a research participant.

This study also aims at investigation into detecting learners' difficulties in reading comprehension in English language for academic purposes context. Precisely, and based on the research purpose and aims, I will conduct this study in order to investigate the needs of second year doctoral students of Biology at Biskra university in terms of comprehension when reading in English.

In this respect, you are invited to take part in this research by completing the questionnaire.

Essentially, your anonymity, privacy, and identity will be protected. Your participation in this research is entirely voluntary. Your consent can be withdrawn at any time.

If you accept to participate in this study, please sign the attached consent form. Your cooperation will be highly appreciated.

For further questions regarding this research project, you are welcome to contact the researcher.

Yours sincerely,

Researcher Contact Details:

Sabrina Lamouri

Email: srina6176@gmail.com

Mohamed Kheider University of Biskra

Faculty of Letters and Languages

Department of English Language and Literature

I have read and clearly understood the researcher's request. I consent to volunteering as a participant in the research project being undertaken by Sabrina Lamouri

Name:

E-mail:

University:

Faculty:

Department:

Date:

Signature

Appendix7: Permission to Conduct Study

Mohamed khider university of Biskra

Department of English Language

Permission to conduct study

Dear Head of Department,

Greetings,

This is to ask permission from your office that we, LAMOURI Sabrina, MA student of Science of the Language Branch, Department of English Language and Literature at Mohamed Kheider University of Biskra be allowed to conduct our study entitled: An Investigation into Detecting Learners' Difficulties in Reading Comprehension in English Language for Academic Purposes Context: The Case of Second Year Doctoral Students of Biology in the Natural and Life sciences Department at Biskra University.

This study aims at investigation into detecting learners' difficulties in reading comprehension in English language for academic purposes context. Precisely, and based on the research purpose and aims, I will conduct this study in order to investigate the needs of second year doctoral students of Biology at Biskra university in terms of comprehension when reading in English.

We guarantee that whatever information gathered will be used only for the purpose of the study and be treated with utmost confidentiality.

Thank you very much and we hope for your kind approval.

Sincerely yours,

Researcher Contact Details:

Sabrina Lamouri

Email: srina6176@gmail.com

Mohamed Kheider University of Biskra

Faculty of Letters and Languages

Department of English Language and Literature

Approved by:

Head of Department : *Biology*

E-mail: *djamil.mokrani@univ-biskra.dz*

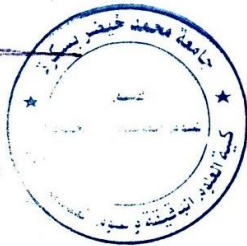
University: *Mohammed Kheider Biskra*

Faculty: *Sciences exact et Sciences de la nature*

Department: *Biology*

Signature

MP



مقراني جميلة

مقراني جميلة

Appendix 8: The Opinionnaire

1. Are there any repetitive questions?

Yes No

- If yes, please specify them.

.....
.....
.....

2. Did you find any grammar/spelling mistakes in the questions?

Yes No

-If yes, please notify them below.

.....
.....
.....

3. Are there any irrelevant questions that need to be removed?

Yes No

-If yes, please provide the number of the question(s) below.

.....
.....

4. Is the questionnaire of reasonable length?

Yes No

5. Are there any ambiguous questions that need to be reformulated and / or clarified?

Yes No

-If yes, please indicate which questions require rewording.

.....
.....

6. What do you think of the layout?

.....
.....
.....

7. Are the response categories appropriate?

Yes No

8. If there are any questions that you believe are of close relevance to the purpose of the questionnaire but were not included, please write them below.

.....
.....
.....

Thank you very much for your time and collaboration**المخلص**

تهدف هذه الدراسة إلى الكشف عن الصعوبات التي تواجه متعلمي اللغة الإنجليزية لأسباب خاصة (ESP). إذ تم إجراءها على طلبة السنة الثانية دكتوراة علم الأحياء بكلية علوم الطبيعة و الحياة لجامعة محمد خيضر ببسكرة. وأما من ناحية المنهجية، فقد تم في هذه الدراسة ربط النموذج التفسيري بالمنهج الكيفي. ولقد اعتمد الباحث على دراسة الحالة بالنسبة لتصميم البحث. ولجمع البيانات تم استعمال الإستبيان المفتوح والإختبار. ولتحليل البيانات تم استعمال الطرق الوصفية. وتعمد الباحث لتنفيذ هذه الدراسة إختيار عينة تتكون من 16 طالب للإجابة على الإستبيان والخضوع لإختبار تحديد الكفاءة. ويجدر بالذكر أنه تم إجراء طريقة تقدير الإحتياجات لتحديد إحتياجات، ونقائص، وأهداف العينة المدروسة. وأشارت النتائج إلى أن الطلبة يواجهون صعوبات حول عدم القدرة على فهم النصوص العلمية المكتوبة باللغة الإنجليزية نظرا لعدة عوامل. هذه الدراسة كشفت أيضا إحتياج الطلبة الحقيقي لتطوير مستوياتهم في اللغة الإنجليزية المرتبطة بميدان دراستهم، دراسات علم الأحياء. وبناءا على ذلك فقد اقترح الباحث بعض التوصيات لتلبية إحتياجات المجموعة المستهدفة، على أن تكون نقطة بداية للأبحاث المستقبلية للتغلب على الصعوبات التي يواجهها طلبة علم الأحياء على مستوى الإنجليزية لأسباب أكاديمية EAP.

الكلمات المفتاحية: علماء الأحياء، الصعوبات، طلبة الإنجليزية لأغراض أكاديمية (EAP)، تحليل الإحتياجات، إستيعاب القراءة، سوء الفهم، النصوص العلمية.